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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **MONITORING TENDON FORCE (LIFT-OFFS)** Mulissa Lara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussore Q.A. MANAGER 09/03/13 Approved by Title Date Paul C. Link PRESIDENT 09/03/13 Approved by Title Date 21 SQ 9.0 TMI.13 ISIa



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1.0 PURPOSE

1.1 This procedure will establish the requirements for monitoring the forces that remain in a tendon for purposes of evaluating the Post-Tensioning System Tendons during the 40th Year In-Service Inspection (Surveillance) at Exelon's Three Mile Island-Unit 1.

2.0 **RESPONSIBILITY**

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 As stated in PSC Procedure QA 4.0.

3.0 QUALIFICATIONS

3.1 As stated in PSC Procedure QA 4.1.

4.0 EQUIPMENT

4.1 The gauges and test equipment necessary for the Quality Control activities will be itemized in PSC Procedure SQ 4.0.

5.0 PRECAUTIONS

5.1 Review the I.S.I. Tendon Surveillance Program Safety Comments for the items that shall apply both for tendon force control and personnel safety.

6.0 QUALITY CONTROL

6.1 All Quality Control Documentation (**QCD**) points noted in this procedure are Hold Points. The work shall not progress past or through a **QCD** without a verbal release from the Inspector. The required information or evaluative data shall be documented on Data Sheet 9.0 attached to this procedure.

7.0 PREREQUISITES

- 7.1 The Grease Cap will be removed.
- 7.2 The Anchorage Inspection of the stressed tendon will be completed.
- 7.3 The Anchorage threads will have been measured and the coupler verified for thread strength per SQ 7.1.
- 7.4 The hydraulic jack has been examined for damage and is in current calibration status.
- 7.5 Stressing pressure gauge has been calibration checked before use as per PSC Procedure QA 10.1.
- 7.6 **QCD** Document the tendon identification, Unit #, and tendon end on Data Sheet 9.0



8.0 MEASUREMENTS

- 8.1 STEEL RULERS
- 8.1.1 Measurements of shim stack height shall be performed with calibrated steel rulers graduated in tenths of an inch (0.1"). The measurements shall be recorded to the nearest 0.1".

8.2 PRESSURE GAUGES

- 8.2.1 Measurements of ram pressure (tendon force) shall be measured by calibrated pressure gauges capable of being read directly to 20 psi or better.
- 8.2.1.1 View the gauge face from a plane of view directly in front of the indicator needle to avoid parallax errors.
- 8.2.1.2 Gauge readings may be interpolated to the nearest 10 psi.
- 8.2.1.3 All pressure gauges used shall have automatic compensation for temperature variations between gauge calibration and gauge use during surveillance.

9.0 MONITORING OF TENDON FORCES

- 9.1 The intention of this operation is to monitor the amount of force remaining on the tendon by taking lift-off readings as the tendon is being stressed. Subsequent evaluation of those lift-off readings with respect to Predicted Forces will determine if that force is acceptable or if degradation of the system has occurred.
- 9.2 Monitoring of Tendon Force can be performed on both ends of a tendon in a simultaneous and controlled manner or on one tendon end at a time, independent of the opposite end of the tendon. These procedures have been developed so that they apply to one end of the tendon. Every effort should be made to measure lift-off at opposite ends of a tendon at the same time. If this is prohibited by plant conditions (i.e., one end is accessible only with the plant operating and the other only when the plant is shut down), then measurements must be made as close together in time as possible and under similar temperature regimes. Adequate communication shall be maintained between both ends of the tendon during the taking of lift-off readings for simultaneous stressing operations. Vertical tendon monitoring of force is to be performed from one end, top end, only unless the tendon was double end stressed during original installation.



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- 9.2.1 Regardless of the method of monitoring there will probably be variations in the forces detected at each end of the tendon. Because of this, the average force from both ends will represent the force that the tendon is holding. If the average force for both ends of the tendon meet the Acceptance Criteria cited in Section 10.0 of this Procedure, that tendon will be acceptable. If the average force does not meet the criteria, then the action required of Section 10 of this Procedure shall be required for the respective condition detected.
- 9.2.2 All data shall be documented on Data Sheet 9.0.
- 9.3 **<u>QCD</u>** Document the concrete surface temperature near the tendon and the ambient air temperature on Data Sheet 9.0. Also document the thermometer identification number and calibration due date for each thermometer used.
- 9.4 <u>QCD</u> The anchorhead and stressing adaptor/stressing rod threads are to be inspected for dirt, burrs, nicks, and damaged threads and measurements taken per SQ 7.1, if any condition precludes proper coupling the condition shall be corrected. Anchorhead threads shall be inspected for deformation before and after any stressing operation and if any deformation is detected Exelon Engineering is to be notified. Document acceptance on Data Sheet 9.0
- 9.5 **QCD** Document the amount of effective wires in each end of the tendon on Data Sheet 9.0. Refer to Data Sheet 8.0 for each end of the tendon.
- 9.6 **QCD** Couple the rams to each anchorhead on that tendon (for vertical tendons only the top anchorhead is used, unless it was double end stressed during original installation). Document on Data Sheet 9.0 that the stressing coupler/stressing rod is evenly aligned on the anchorhead washer and that full thread engagement is obtained.
- 9.6.1 Note do not let coupler touch shims.
- 9.7 **<u>QCD</u>** On Data Sheet 9.0 document the ram and gauge identification and the calibrated status of each. Also document the ram calibration data including its area and constant, K.
- 9.8 **QCD** On Data Sheet 9.0 document the dimension of each shim stack height, from the bearing plate to the bottom of the anchorage. Document the thickness of each shim in each shim stack, starting from the Bearing Plate and working up to the Anchorage. Also document the ruler identification and calibration date.
- 9.9 **<u>QCD</u>** Establish the Lift-off Overstress Force (LOSF) for the tendon being monitored. Tendon Lift-off Overstress Force for purposes of Monitoring of Tendon Force shall be that force less than 1592 kips (based on a tendon with 169 effective wires, 9.425 kips per wire), which permits placement of the feeler gauges or provides complete looseness of the shim stacks.



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- 9.9.1 Maximum force equals the number of effective wires multiplied by 9.425 kips.
- 9.10 **QCD** On Data Sheet 9.0 document the selected Tendon Predicted Force (PF), document the 95% Predicted Force (0.95PF), and document the 90% Predicted Force (0.9PF), from the Predicted Force Tables of Procedure SQ 9.1. Space is provided beneath each entry to document the gauge pressures for each force requirement.

<u>CAUTION</u> ONCE ACTUAL STRESSING BEGINS, THE RAM MUST NEVER BE EXTENDED TO THE FULL LIMIT OF ITS STROKE. THE EXTENSION SHOULD BE AT LEAST 1/2" LESS THAN THE FULL STROKE OF THE RAM.

9.11 TENDON LIFT-OFF (MONITORING)

- 9.11.1 Gradually pressurize the rams in 20 to 100 psi increments until lift-off is achieved. Carefully observe for signs of rotation. If rotation is noted at any time, stop work until shim rotation has stopped. If rotation is noted, pressurizing shall stop until rotation ceases. Once rotation has ceased and alignment has been verified keep increasing pressure at prescribed intervals. The intent is to allow rotation to be released in a slow and controlled fashion. Do not exceed a Lift-off Overstress Force of 1592 kips (based on a tendon with 169 effective wires, 9.425 kips per wire), if lift-off has not been achieved at this force, then unload the jack, and notify Exelon Engineering for resolution of the condition.
- 9.11.2 Once the shims become loose, insert two feeler gauges or shim stock, about 0.030" in thickness, between the anchorhead and shim. The gauges should be located about 180 degrees apart and approximately centered.
- 9.11.3 Reduce the ram pressure until the load is transferred on the shim stack. It shall not be necessary to return to zero gauge pressure, but at least 2000 psi less than the pressure that was needed to insert the shim stock.
- 9.11.4 Gradually pressurize the ram while pulling the feeler gages. The point at which the feeler gauge comes loose and can be withdrawn is the Liftoff Point.
- 9.11.5 **<u>QCD</u>** Document the pressure for each Liftoff of each shim stack. Place a circle around that Liftoff Value that was the last to have the feeler gauge or shim removed. (The last shim stack to come loose.) Do not intermix the values for the shim stacks. Stack 1 will always be Stack 1.



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- 9.11.6 Repeat sections 9.11.3, 9.11.4 and 9.11.5 until 3 consecutive Liftoff readings have been taken. The three circled readings should be within 25 kips of each other, if this is not achieved the feeler gauges may be repositioned, and additional liftoff readings may be taken until three consecutive readings within 25 kips of each other are achieved.
- 9.11.7 The space between the stacks of shim halves for the first shims in direct contact with the anchorage should not exceed a space of 1/4". The remaining shims in the shim stack may be placed with a larger spacing but should not exceed 1/2".
- 9.11.8 Slowly decrease the pressure on the jack to allow the stressing washer to reseat onto the shims. No additional shims are to be added at this time.
- 9.11.9 No part of the anchorhead shall overhang the shim stack. If the anchorhead is not correctly positioned after releasing the pressure, gradually re-pressurize the ram and adjust as necessary.
- 9.11.10 The ram shall be uncoupled from the anchorage.
- 9.11.11 If the lift-off forces are determined to be acceptable, this tendon shall be completed by replacing the grease can in accordance with PSC Procedure SQ 12.0.
- 9.11.12 <u>NOTE:</u> Neither end shall be de-tensioned until lift-off has been recorded for both ends.
- 9.11.13 <u>QCD</u> Post the Circled Liftoff Values into the Circled Liftoff Value Column. It may be possible to have the Liftoff occur at the same pressure in each shim stack. Add the Circled Liftoff Values and divide by 3 to get the end average. Post the end average to Data Sheet 9.0. Convert the Average Pressure (PSI) to Force (KIPS) and document results.
- 9.11.14 <u>QCD</u> Enter the end average from the opposite end of the tendon if it is available at this time.
- 9.11.15 **<u>QCD</u>** Calculate the Average Liftoff Value (ALV) for this tendon by averaging the end averages from both ends.
- 9.11.16 <u>QCD</u> Document the acceptance or non-acceptance of the average liftoff value for the condition representative of the tendon on Data Sheet 9.0. Choose one of the conditions listed in Section 10.0 as each condition might apply.
- 9.11.17 **<u>QCD</u>** Document the need for Adjacent Tendon Monitoring and the tendon numbers. Notify Exelon that Adjacent Tendon Monitoring is being performed.



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10.0 ACCEPTANCE CRITERIA

- 10.1 The average liftoff value of the forces required to achieve lift-off for each tendon shall not be less than the 95% Predicted Force obtained from PSC Procedure SQ 9.1.
- 10.2 If the average value of the end forces required for lift-off fails to meet the acceptance criteria of Section 10.1, but equals or exceeds the 90% Predicted Force obtained from PSC Procedure SQ 9.1, the tendons designated as adjacent to the defective tendon and listed in SQ 9.1, Table 3.0 or 4.0 as applicable shall be checked as outlined in Section 11.0. If both adjacent tendons satisfy the acceptance criteria as indicated in section 10.1, then the original tendon shall be restored to its Predicted Force within a minus 0%, plus 6% tolerance, but in no case, no greater than 0.70 GUTS as determined for the number of effective wires, the single deficiency shall be considered unique and acceptable.
- 10.2.1 If either of the adjacent tendons fails to satisfy the acceptance criteria of section 10.1, the extent of investigation into the cause, which may include de-tensioning the deficient tendons, shall be determined by Exelon. This condition does not meet IWL requirements and is considered reportable to the NRC by Exelon.
- 10.3 If the average value of the end forces required for lift-off falls below the 90% Predicted Force obtained from PSC Procedure SQ 9.1, an investigation is to be conducted by Exelon to determine the extent and cause of the occurrence and the required course of action to be taken. This condition does not meet IWL requirements and is considered reportable to the NRC by Exelon.
- 10.4 The average of all normalized tendon lift-off forces, including adjacent tendons, if any, for each tendon group shall be equal to, or greater than, the required minimum average tendon force for that tendon group. The required minimum average force is 1033 kips for vertical tendons,1064 kips for dome tendons, and 1108 kips for hoop tendons. This requirement will be verified upon completion of the final surveillance report
- 10.5 <u>QCD</u> Any tendon which has a lift-off force below its specified 95% Predicted Force, and has not been required to be de-tensioned, shall have both ends re-tensioned to within minus 0%, plus 6% of the specified Predicted Force but in no case, no greater than 0.70 GUTS as determined for the number of effective wires. Tendon shall not be detensioned, however, both ends of a double end stressed tendon, or, one end of a single end stressed tendon shall be taken to OSF to ensure full transfer of force. The final lift-off force (lock-off) shall be the original predicted force from PSC Procedure SQ 9.1; Data Sheet 11.0 of PSC Procedure SQ 11.0, shall be completed for all such tendons.
- 10.6 If any deformation of anchorage threads is detected before or after any stressing operation, Exelon Engineering is to be notified.



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11.0 ADJACENT TENDON - MONITORING OF FORCES

- 11.1 The monitoring of forces in tendons adjacent to the defective tendon shall follow the requirements of this procedure, as each applies.
- 11.2 It shall be necessary to remove the Grease Cap in accordance with PSC Procedure SQ 6.0 using Data Sheet 6.0 for the documentation requirements for each adjacent tendon.
- 11.3 It shall not be necessary to take Grease Samples unless water is detected during the inspection. Grease samples may be taken if requested by Exelon.
- 11.4 It shall be necessary to perform the anchorage inspection in accordance with PSC Procedure SQ 8.0. Data Sheet 8.0 shall be used to document this information for each Adjacent Tendon.
- 11.5 It shall not be necessary to perform the concrete inspection of PSC Procedure SQ 8.3.
- 11.6 Lift-off monitoring shall be performed in accordance with Section 9.11 of this procedure and evaluated per Section 10.0.

12.0 NOTIFICATION

12.1 <u>QCD</u> – Exelon shall be formally notified with a nonconformance report when each one or more of the Acceptance Criteria noted in section 10.0, of this procedure are not met.

13.0 DOCUMENTATION

- 13.1 The items requiring documentation in this procedure, shall be documented on Data Sheet 9.0.
- 13.2 Some information from Data Sheet 8.0 of PSC Procedure SQ 8.0, which has already been started for this tendon, shall require posting onto Data Sheet 9.0.

14.0 ATTACHMENTS

14.1 Data Sheet 9.0



Project: TMI 40 TH YEAR TENDON SURVEILLANCE	Unit 1	
(7.6)Tendon No.: Tendon End:	Shop Field	
LIFT-OFF INSPECTION CRITERIA	Q.C. S	ignoff
(9.3) Temp. of Concrete: <u>°F</u> Thermometer No.: Recal Date:		
Ambient Temp.: <u>°F</u> Thermometer No.: Recal Date:		
(9.4) Anchorhead and Stressing Adapter Threads : Acceptable Unacceptable		
(9.5) Number of Effective Wires:	•••	
(9.6) Anchorhead and Stressing Adapter Engagement/Alignment : Acceptable Unacceptab	e	
(9.7) RAM ID: Recal Date: RAM Area: K =		
Gauge ID: Recal Date: Daily Check:		
(9.8) Shim Stack Height: #1 in. #2 in. Ruler ID: Recal Date:		
Individual Shims: Stack #1: in. Stack #2:	in	
(9.9) Lift-off Overstress Force (LOSF): kips Pressure:	psi	
(9.10) PF: kips 95% PF: kips 90% PF:	kips	
psipsi	psi	
(9.11.5) As-Found Lift-Off (9.11.13) C	ircled Values	
Stack #1: 1) psi Stack #2: 1) psi 1)		
2) <u>psi</u> 2) <u>psi</u> 2)		
3) <u>psi</u> 3) <u>psi</u> 3) <u>si</u> 3) <u></u>		
(9.11.13) End Average Force (this end): kips Average:	psi	
(9.11.14) End Avg. Force (other end): kips (9.11.15) Average Liftoff (ALV)	kips	
(9.11.16) Liftoff (ALV) Acceptance Criteria:		
a)		
b) ☐ Adjacent Tendons to be stressed – ALV is < 95%PF but ≥ 90%PF. Document on a NCR.		
c) Unacceptable – ALV is < 90%PF. Document on a NCR.		1
NCR Required Yes No Customer Notified NCR No.:		
(9.11.17) Adjacent Tendon Lift-Offs (Note: Use a separate Data Sheet 9.0 to document Liftoff forces.)		
Adj Tendon: Acceptable – ALV > 95% of PF, The original scope tendon S		
a) { This Tendon: restored to within -0/+6% of PF, but in no case, no greater than determined for the number of effective wires.	0.70 GUTS as	
EXELON Notified: Yes No Name/Date:		
Adi Tendon	ent the condition	
Adj Tendon: on a NCR.	E 한국에 유가 제 유럽 (전국에서 전체) 1	
Customer Notified NCR No.:		
c) _ Adj Tendon: Unacceptable – ALV < 90% of PF for either tendon. Docum on a NCR.	ent the condition	
Customer Notified NCR No.:		
QC Reviewed: Level:	Date:	
	01 00 0 0 TH	



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE

PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE

PRESTRESS FORCES

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Approved by

Q.C. INSPECTOR Title

Q.A. MANAGER

Title

PRESIDENT

Title

09/03/13

Date

09/03/13

Date

09/03/13

Date

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1.0 PURPOSE

1.1 The purpose of this procedure is to provide in table form the predicted lift-off forces for the 40th Year In-Service Inspection (Surveillance) at Exelon's Three Mile Island Nuclear Plant.

2.0 SURVEILLANCE TENDON DATA

- 2.1 The Normalization Adjustment, the Predicted Forces, 90% of the Predicted Forces (.9 PF), and 95% of the Predicted Forces (.95 PF) have been obtained from Exelon.
- 2.2 The Normalization Adjustment, the Predicted Forces, 90% of the Predicted Forces (.9 PF), and 95% of the Predicted Forces (.95 PF) to be used during the 40th year inspection are listed below for each UNIT 1 tendon scheduled for monitoring of force. The same information is provided for the adjacent tendons.



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3.0 TMI UNIT 1 – 40TH YEAR PREDICTED FORCES – ORIGINAL SCOPE TENDONS

TENDON	NORMALIZATION ADJUSTMENT (KIPS)	PREDICTED FORCE (KIPS)	95% PF (KIPS)	90% PF (KIPS)
D-142	-21	1,128	1,072	1,015
D-143	-47	1,153	1,095	1,038
D-144	-11	1,117	1,061	1,005
D-224	5	1,101	1,046	991
D-225	45	1,061	1,008	955
D-226	26	1,081	1,027	973
D-236	7	1,100	1,045	990
D-237	19	1,088	1,034	979
D-238	12	1,095	1,040	986
D-302	-9	1,116	1,060	1,004
D-303	-35	1,142	1,085	1,028
D-304	-7	1,114	1,058	1,003
H13-02	-5	1,105	1,050	995
H13-03	-40	1,141	1,084	1,027
H13-04	14	1,086	1,032	977
H13-10	4	1,097	1,042	987
H13-11	-54	1,154	1,096	1,039
H13-12	-2	1,103	1,048	993
H24-14	-27	1,128	1,072	1,015
H24-15	N/A*	1,051	998	946
H24-17	25	1,076	1,022	968

TENDON	NORMALIZATION ADJUSTMENT (KIPS)	PREDICTED FORCE (KIPS)	95% PF (KIPS)	90% PF (KIPS)
H24-22	-37	1,116	1,060	1,004
H24-23	34	1,045	993	941
H24-24	-16	1,095	1,040	986
H35-01	-41	1,142	1,085	1,028
H35-02	8	1,093	1,038	984
H35-05	-67	1,168	1,110	1,051
H62-25	46	1,054	1,001	949
H62-26	2	1,099	1,044	989
H62-27	47	1,053	1,000	948
V-30	-10	1,179	1,120	1,061
V-32	-7	1,176	1,117	1,058
V-33	-48	1,217	1,156	1,095
V-107	-6	1,175	1,116	1,058
V-108	14	1,155	1,097	1,040
V-109	33	1,136	1,079	1,022
V-159	20	1,149	1,092	1,034
V-160	-6	1,175	1,116	1,058
V-161	-13	1,182	1,123	1,064

= SURVEILLANCE TENDON

= ADJACENT TENDON



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4.0 TMI UNIT 1 – 40TH YEAR PREDICTED FORCES – AUGMENTED SCOPE TENDONS

TENDON	NORMALIZATION ADJUSTMENT (KIPS)	PREDICTED FORCE (KIPS)	95% PF (KIPS)	90% PF (KIPS)
H46-33	N/A	1,293	1,164	1,228
H46-34	N/A	1,232	1,170	1,109
H46-35	N/A	1,293	1,228	1,164
H51-39	N/A	1,309	1,244	1,178
H51-40	N/A	1,198	1,138	1,078
H51-41	N/A	1,321	1,255	1,189

TENDON	NORMALIZATION ADJUSTMENT (KIPS)	PREDICTED FORCE (KIPS)	95% PF (KIPS)	90% PF (KIPS)
V-114	N/A	1,332	1,265	1,199
V-115	N/A	1,311	1,245	1,180
V-116	N/A	1,308	1,243	1,177
V-135	N/A	1,347	1,280	1,212
V-136	N/A	1,306	1,241	1,175
V-137	N/A	1,353	1,285	1,218

= SURVEILLANCE TENDON

= ADJACENT TENDON



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IN-SERV	EILLANCE CORPORATION ICE INSPECTION VEILLANCE PROGRAM	
DETER	NSION TENDON	
Melissa Lara	Q.C. INSPECTOR	09/03/13
Prepared by Gerald F. Bussore	Title Q.A. MANAGER	Date 09/03/13
Approved by fami C. Life	Title	Date
Approved by	Title	09/03/13 Date



1.0 PURPOSE

1.1 This procedure will establish the requirements for detensioning tendons for purposes of visual inspection, testing and evaluation, during In-Service-Inspections (surveillance) of Post-Tensioning Systems Tendons at Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 **RESPONSIBILITY**

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 As stated in PSC Procedure QA 4.0.

3.0 QUALIFICATIONS

3.1 As stated in PSC Procedure QA 4.1.

4.0 EQUIPMENT

4.1 The gauges and test equipment necessary for the Quality Control activities will be itemized in PSC Procedure SQ 4.0.

5.0 QUALITY CONTROL

5.1 There are no Hold Points or documentation requirements for this Procedure.

6.0 PRECAUTIONS

- 6.1 Do not exceed a jack force of 1592 kips (for a tendon with 169 effective wires, 9.425 kips per wire). If lift-off has not been achieved at this maximum force. The jack shall be unloaded and Exelon Engineering shall be notified for resolution of the condition.
- 6.2 Review the I.S.I. Tendon Surveillance Program Safety Comments for the items that shall apply both for tendon force control and personnel safety.
- 6.3 Verify that the tendon to be de-tensioned is listed in PSC Procedure SQ 2.0 or has been approved for de-tensioning by Exelon Engineering.
- 6.4 No more than one tendon from each group (dome, hoop, vertical) shall be de-tensioned at any given time without Exelon Engineering concurrence.

7.0 PREREQUISITES

- 7.1 The tendon will have been monitored for tendon force as required of PSC Procedure SQ 9.0. The De-tensioning shall continue from that point where the final or third liftoff was taken. The tendon shall not be de-tensioned until the liftoffs are documented. The ram will still be coupled to the anchorage.
- 7.2 De-tensioning of each tendon end may proceed independently of the other end; however, jacks must not be uncoupled until the tendon is completely de-tensioned.

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7.3 To alleviate holding jacks under pressure for period of time, it is recommended that both ends of a tendon be de-tensioned in unison except single end stressed vertical tendons which are detensioned from one end. This should assist in correct positioning of the anchor head.

8.0 DETENSIONING THE TENDON

- 8.1 Where a tendon is specified to require De-tensioning, to permit inspection of the Detensioned anchorages, wires, shims and bearing plates, the following operations shall take place.
- 8.2 With the final liftoff being completed and the load completely off the shims, all the shims shall be removed. If more clearance is required, the load on the tendon may be increased up to a maximum jack force of 1592 kips (based on a tendon with 169 effective wires). If the shims can not be removed at this force, then unload the jack, and notify Exelon Engineering to resolve condition.
 - 8.2.1 Keep the shims from each stack separate (The shims are paired and must be stacked in pairs.). This will permit the shims to be replaced without extensive rematching.

<u>CAUTION</u> AFTER IMPLEMENTING STEP 8.3, A 10 MINUTE WAITING PERIOD **SHALL** BE IMPOSED TO ALLOW THE DISSIPATION OF ENERGY THT MAY BE TRAPPED WITHIN THE TENDON.

- 8.3 With the shims removed, the load on the tendon shall be reduced to zero. The maximum de-tensioning rate of the jacks for each tendon shall correspond to a reduction in tendon force in a slow and controlled manner. Both ends of a tendon shall be de-tensioned in unison unless otherwise directed by the PSC Superintendent. To alleviate holding jacks under pressure for periods of time, it is recommended that both ends, if applicable, of a tendon be de-tensioned in unison.
- 8.4 Jacks shall not be uncoupled until the tendon is completely de-tensioned.
- 8.5 Once de-tensioning is complete, anchorage inspection shall be performed per PSC Procedure SQ 8.0 for corrosion, cracks, off-size button heads, missing, broken, and/or damaged wires and recorded on Data Sheet 8.0A, 8.0B if there is any change in previously recorded data.

9.0 CONTINUING OPERATIONS

- 9.1 Once De-tensioning is complete any number of operations may follow such as:
 - 9.1.1 Continuity Test
 - 9.1.2 Tendon Wire Removal

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9.1.3 Re-tensioning the Tendon

10.0 ACCEPTANCE

10.1 There are no requirements for acceptance or non-acceptance during De-tensioning of a Tendon.

11.0 DOCUMENTATION

11.1 Section 8.5 of this procedure to be documented to Data Sheet 8.0A or 8.0B of PSC Procedure SQ 8.0.



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE

> PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION TENDON SURVEILLANCE PROGRAM**

DE-TENSIONED ANCHORAGE INSPECTION

Mulissa Lara Prepared by

Gerald F. Bussone Approved by

c. L

Approved by

Q.C. INSPECTOR Title

Q.A. MANAGER

Title

PRESIDENT

Title

09/03/13

Date

09/03/13

Date

09/03/13

Date

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N1091 PSC PROCEDURE SQ 10.1 DETENSIONED ANCHORAGE 09/03/13 Page 2 of 6 Revision 0

1.0 PURPOSE

1.1 This procedure will establish the requirements for the visual inspection and evaluation of the tendon end anchorages, shims, bearing plate, button heads and wires during In-Service-Inspection (Surveillance) of Post-Tensioning System Tendons after that tendon has been De-tensioned at Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 RESPONSIBILITY

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 As stated in PSC Procedure QA 4.0.

3.0 QUALIFICATIONS

3.1 The inspector performing this inspection is to be qualified as a Level II examiner as defined in PSC's written certification practice approved by Exelon and each examiner shall be approved by the Exelon Responsible Engineer.

4.0 EQUIPMENT

4.1 The gauges and test equipment necessary for the Quality Control activities will be itemized in PSC Procedure SQ 4.0.

5.0 QUALITY CONTROL

5.1 All Quality Control Documentation (QCD) points noted in this procedure are Hold Points. The work shall not progress past or through a QCD without a verbal release from the Inspector. The required information or evaluative data shall be documented on Data Sheet 8.0A or 8.0B of PSC Procedure SQ 8.0 that has already been started for this tendon.

6.0 PRECAUTIONS

CAUTION - NEVER STRIKE THE BUTTONHEADS, THE WIRES OR THE ANCHORAGES OF A STRESSED TENDON WITH A HAMMER OR ANY OTHER METAL OBJECT.

7.0 PREREQUISITES

- 7.1 The Anchorage Cleanup will be completed.
- 7.2 The tendon will be in a De-tensioned Condition.



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8.0 ANCHORAGE INSPECTION

- 8.1 The tendon anchorage, including the shop head, field head and bushing, bearing plate, stressing shims, and wires of all selected tendons shall be visually inspected for signs of excessive stress, corrosion, cracks, missing, or broken wires. Button heads shall be inspected for cracks, splits and slips.
- 8.2 Inspect the interior of the bearing plate and trumpet tube for any evidence of voids or incompleteness of the grease coverage. It should be noted that air pockets will be seen, probably in the shape of a cone. This is the typical condition of the grease in a solid condition and must not be construed as a deficiency.
- 8.3 Inspect the tendon wires from the bottom of the anchorage into the tendon duct for signs of corrosion. Use PSC Procedure SQ 8.0 Table 1 to evaluate the Corrosion Condition of the wires.
- 8.3.1 **QCD** Document the Corrosion Condition rating for the tendon wires.
- 8.4 Inspect the bottom side of the anchorages for Corrosion Level rating, using PSC Procedure SQ 8.0 Table 1 to evaluate the anchorages.
- 8.4.1 **QCD** Document the Corrosion Level rating for the anchorages. (9.2 of DS 8.0)
- 8.5 Inspect the shims and bearing plate for signs of Corrosion using PSC Procedure SQ 8.0 Table 1 for evaluation. Clean the shims and bearing plate as necessary to perform this evaluation.
- 8.5.1 **QCD** Document the Corrosion Level ratings for the shims and bearing plate (9.2 of DS 8.0).
- 8.6 Inspect the anchorages, shims and bearing plates for any evidence of cracking during the Corrosion Level evaluation.
- 8.6.1 **QCD** Document any cracks found on Sketch Sheet 8.0 from PSC Procedure SQ 8.0. Include any dimensions that could help to locate or evaluate the cracks. Indicate whether cracks or excessive stress have been found on DS 8.0 (10.1).
- 8.7 The anchorages shall be pushed back from the ends of the wires toward the bearing plate. This may be accomplished manually or with mechanical devices, just so the anchorages, threads wires are not damaged in any way.
- 8.8 Inspect the wires from the bottom of the button heads to that point where the bottom of the anchorage was located, for signs of corrosion. The button heads shall be visually inspected at this time in accordance with the requirements of Section 11.0 of PSC Procedure SQ 8.0.

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- 8.8.1 **QCD-** If the Corrosion Condition of this area of the wires is the same or better than that evaluated in Section 8.3.1 of this procedure, it shall not be necessary to enter any additional information on the Data Sheet.
- 8.8.1.1 **QCD-** If the Corrosion Condition is of a lower rating than the original entry in the Corrosion Condition rating area shall be corrected to reflect that lower rating.
- 8.8.1.2 It shall be acceptable to delay the documentation of Section 8.3.1 until this area of the wire has been inspected and evaluated. If both ratings are the same, only one entry need be made.
- 8.9 With the anchorages pushed back, protruding wires can be evaluated for Continuity through the use of PSC Procedure SQ 10.5.
- 8.9.1 If it is determined during this inspection that a protruding wire is broken, it shall not be necessary to perform the Continuity Test on that wire, but that wire shall be removed and Exelon notified with a nonconformance report.
- 8.9.2 If it is determined during this inspection that any other wire is broken, that wire shall be removed and Exelon notified with a nonconformance report.
- 8.9.2.1 **QCD** Document the broken protruding wire as required of PSC Procedure SQ 10.5 on Data Sheet 8.0.
- 8.9.2.2 **QCD** Additional broken wires shall be documented directly on Data Sheet 8.0 in the manner required of PSC Procedure SQ 8.0 Section 12.3.
- 8.9.2.3 If the amount of broken wires detected in this inspection increases the total quantity of Broken/Missing Wires/Button heads for the earlier Anchorage Inspection of this tendon in a stressed condition to 1 or more during this surveillance, it shall be necessary to notify Exelon Nuclear of this condition in accordance with the requirements of Section 9 of this Procedure.
- 8.9.2.4 It shall be acceptable to continue working to complete all the inspections so that all the results are available for evaluation. Exelon shall be notified within 24 hours of discovery.
- 8.10 The tendon wire to be used for physical testing shall be removed at this time, in accordance with PSC Procedure SQ 10.2.
- 8.11 Damaged or excessively deformed shims shall be replaced at this time. Damage other than would be noted from the load resting on the shims shall be documented.
- 8.11.1 **QCD** Document unusual damage or conditions for any item of the tendon end, on Sketch Sheet 8.0 (PSC Procedure SQ 8.0).



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- 8.12 With the completion of this inspection and the required documentation, if all results are acceptable, then it shall be permitted to continue working or inspecting the tendons.
- 8.13 Once the inspections of Procedure SQ 10.1 are completed, if nonconforming conditions are detected and Exelon notified in accordance with Section 9 of this procedure, no further work beyond PSC Procedure SQ 10.1 shall be performed on this tendon without the permission of Exelon, which should include a recommendation for corrective action.
- 8.14 The tendon ends shall be protected whenever it is not being worked or inspected. This protection shall include a light coating of grease and covering with a plastic bag, plastic sheeting or the grease cap if that tendon is exposed to the weather.
- 8.15 Prior to pulling the anchorage back to the ends of the wire, the tendon wires shall be coated with grease. The grease may be brushed on or poured on, just so the wires get coated.
- 8.16 The anchorages shall be pulled back to the button heads.
- 8.17 Examine the tendon wires in the tendon duct after pulling back the anchor heads and re-centering the tendon. If the tendon wires in the trumpet tube appear to be a little thin on grease coating, it shall be acceptable to brush some grease onto the wires as an additional measure of protection.
- 8.18 That portion of wire extending from the back of the anchorage to the pushed back location of the anchorage shall be coated with grease.
- 8.19 Be prepared to catch any runoff of the grease as it is being applied to the tendon wires.
- 8.20 The tendon shall now be ready for Re-tensioning, concluding this procedure.

9.0 NOTIFICATION

- 9.1 Exelon shall be formally notified when each one or more of the following conditions are detected as a result of the inspection of a tendon.
- 9.1.1 CORROSION LEVEL C-when detected for Anchorages, Tendon Wire, Shims and/or Bearing Plates, Exelon shall be notified with a nonconformance report.
- 9.1.2 CRACKS-no matter how small, when detected for Anchorages, Shims and/or Bearing Plates, Exelon shall be notified with a nonconformance report.

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9.1.3 ADDITIONAL MISSING OR BROKEN WIRES/BUTTONHEADS-when detected for a quantity of 1 or more since the original installation or previous surveillance, Exelon shall be notified with a nonconformance report, but it will not be necessary to stop work to await approval of the NCR.

10.0 DOCUMENTATION

- 10.1 The items in this procedure requiring documentation shall be documented on Data Sheet 8.0 already started for this tendon from the Anchorage Inspection of PSC Procedure SQ 8.0.
- 10.2 The Data Sheet references the applicable section number of the procedure for each QCD point.



N1091 PSC PROCEDURE SQ 10.2 TEST WIRE REMOVAL 09/03/13 Page 1 of 6 Revision 0

EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **TEST WIRE REMOVAL** Mulissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussore Approved by Q.A. MANAGER 09/03/13 Title Date , c. his PRESIDENT 09/03/13 Approved by Title Date 25 SQ 10.2 TMI.13 ISI



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1.0 PURPOSE

- 1.1 This procedure will establish the requirements for removing a sample wire to be used for physical testing, during the 40th Year In-Service-Inspections (Surveillance) of the Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant Unit 1.
- 1.2 One continuous and any other discontinuous tendon wires will be removed from the designated tendons to have wire removed. Do not remove more than three wires from any one tendon during this surveillance period without TMI Engineering approval.

2.0 RESPONSIBILITY

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 As stated in PSC Procedure QA 4.0.

3.0 QUALIFICATIONS

3.1 As stated in PSC Procedure QA 4.1.

4.0 EQUIPMENT

4.1 Quality Control gauges or test equipment will not be required for this activity, except where hydraulic devices and gauges are used.

5.0 QUALITY CONTROL

5.1 This procedure contains <u>HOLD POINTS</u>. The work shall not progress past or through a <u>HOLD POINT</u> without a sign-off from the QC Inspector. All Quality Control Documentation (<u>QCD</u>) points shall only require documentation of information or evaluation data. The sign-offs and required information or evaluation data shall be documented on Data Sheet 10.2 or Data Sheet 8.0 of PSC Procedure SQ 8.0.

6.0 PRECAUTIONS

- 6.1 When pulling individual wires, never exceed 80% GUTS of that wire when pulling with the pulling device 9,425 pounds.
- 6.2 Discontinuous wires shall not be used to satisfy the requirements for the physical testing of this procedure.
- 6.3 If other Broken/Missing Wires are found in this tendon as a result of this inspection or previous inspections, it shall be necessary to select a wire from this tendon that would tend to balance the forces in that tendon anchorage and try to maintain symmetry with the missing wires in the hole pattern.



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- BE SURE THAT THE CORRECT WIRE HAS BEEN LOCATED BEFORE CUTTING.
- BE SURE THAT THIS TENDON REQUIRES SAMPLE WIRE REMOVAL.
- USE CARE TO AVOID DAMAGING OTHER WIRES OR BUTTONHEADS.
- AVOID UNNECESSARY MARKS OR DAMAGE TO THE WIRE WHILE REMOVING.
- USE CARE WHEN COILING THE WIRE AND SECURING IT INTO A COIL. THIS WIRE HAS CONSIDERABLE SPRING FORCE AND MUST BE PREVENTED FROM UNCOILING VIOLENTLY.

7.0 PREREQUISITES

- 7.1 The anchorage inspection will be complete and Data Sheet 8.0 available.
- 7.2 The tendon will be detensioned; monitoring of forces has been completed.

8.0 WIRE REMOVAL

- 8.1 A wire shall be selected, preferable from the two outer rows of the anchorage hole pattern.
- 8.2 The Tendon Surveillance Wire Puller shown in Figure 1 of PSC Procedure SQ 10.5 shall be attached to the selected wire.
- 8.3 The wire shall be pulled with the Wire Puller using as little force as possible.
- 8.3.1 If the wire cannot be moved by hand, it shall be acceptable to use any mechanical device to accomplish that purpose, such as a "Come-A-long", "Chain-Hoist", "Chain Pawl" or hydraulic ram.
- 8.3.1.1 It is unlikely that anything but the hydraulic ram will be able to exert such an amount of force so as to yield or break the wire. Therefore hydraulic devices shall be controlled for force through a calibrated gauge or controlled for maximum force through a locking valve to control the amount of pressure to be exerted.
- 8.3.1.2 There remains a possibility that a limited force might not move the wire. It shall be necessary to abandon that wire and select a new wire, continuing this process until a wire can be moved. All abandoned wires shall be identified on Data Sheet 8.0 of Procedure 8.0. All wires shall be considered effective wires provided the yield strength of the wire was not exceeded.
- 8.4 Once a tendon wire is located that can be moved, it shall be witnessed for that movement at the opposite end of the tendon to verify that this is a continuous wire.



- 8.5 Prepare to cut the wire at the opposite end of the tendon from where the wire is to be pulled.
- 8.5.1 **QCD** Document the location of wire removal on Data Sheet 8.0 of Procedure SQ 8.0. Once this is posted, document that action on Data Sheet 10.2 of this Procedure.
- 8.5.2 Measure back from the buttonhead 1 inch plus or minus 1/16 inch and mark or scribe a line; it shall be acceptable to notch the wire with a file.
- 8.5.3 Cut the wire somewhere between the buttonhead and the marked line, but not on the line.
- 8.5.4 Pull the wire completely through the tendon duct.
- 8.5.4.1 While pulling, the entire length of the tendon wire shall be visually inspected for pitting, corrosion, or other signs of deterioration and evaluated in accordance with TMI Procedure 1301-9.1 Rev 23.
- 8.5.4.1.1 <u>HOLD POINT</u> Document the Category of Corrosion rating on Data Sheet 10.2, for every 10 feet of length.
- 8.5.4.1.2 If the Category of Corrosion is found to be active as defined in Table 1 of SQ 8.0, TMI Engineering shall be notified with a nonconformance report. TMI Engineering shall provide the final corrective action, which could include removing additional wires and performing Physical Testing.
- 8.5.4.2 While the tendon wire is being pulled, it may be cleaned of excess grease and coiled into coil form of approximately five-foot diameter. Secure the coil from unwinding. Solvent cleaning may be performed to facilitate cleaning before inspection.
- 8.5.4.2.1 It shall be acceptable to cut the wires into 10 foot lengths if coiling is impractical. The cut wires shall be identified as required of Section 8.5.5 of this procedure.
- 8.5.4.3 After the tendon wire has been pulled through, it shall be measured for length.
- 8.5.4.3.1 **QCD** Document the total length of wire on Data Sheet 10.2. Remember to include the length of wire that was cut from the opposite end.

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8.5.4.4 WIRE SAMPLE QUANTITY AND LOCATION REQUIREMENTS

8.5.4.4.1 ACCEPTABLE WIRE

8.5.4.4.1.1 Three specimens shall be tested. One sample shall be taken from approximately the middle of the tendon wire length, with the two remaining samples being taken, one from approximately each end of the tendon wire.

8.5.4.4.2 BROKEN WIRE

8.5.4.4.2.1 If Broken Wires require testing, three specimens shall be tested. One sample shall be taken from the wire length about one foot from either side of the break. The two remaining samples shall be taken, one from approximately each end of the tendon wire.

8.5.4.4.3 UNACCEPTABLE CATEGORY OF CORROSION CONDITION

- 8.5.4.4.3.1 If Unacceptable Category of Corrosion Condition Wires require testing, at least one specimen shall be tested, with that sample being taken from what is judged to be the worst representative section of the wire length. Other samples may be selected and/or tested at the request of TMI Engineering.
- 8.5.4.5 If the wire testing is to be performed on site, it shall be acceptable to cut the 3 sample wires while the wire is being pulled out and coiled. Refer to PSC Procedure SQ 10.3 for the control and documentation requirements. The sample shall be cut from each end and the middle of the wire and as cited in Section 8.5.4.4.1.1 above and shall be about 10' long, unless the wires are to be cut to the required testing length.
- 8.5.4.6 Sample selection shall include areas representative of the most significant Category of Corrosion if this condition exists on the removed wire. Provide samples of this condition in addition to the original 3 samples required. Samples shall not contain gripper marks from the pulling device.
- 8.5.4.6.1 As a note of caution, be sure that the wire is moving freely before cutting. Otherwise there could be difficulty in removing the wire, requiring assist devices that could leave surface marks on the wire.
- 8.5.4.6.2 <u>QCD</u> When the wire is cut for samples, document the area of removal on Data Sheet 10.2 for later transfer to Data Sheet 10.3 of PSC Procedure SQ 10.3. Document each location of sample removal and tag each cut length for area of removal, tendon identification, pulling direction, date, and plant name and unit.

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- 8.5.5 Attach a tag to the end of the wire being pulled that identifies the tendon, end of removal, pulling direction, date, and plant name and unit. If the wire is cut for samples during removal, the cut lead or front end of the wire shall be identified by tendon number, end of removal, and location in the total length of the test wire to permit reconstruction of that wire as it existed in the tendon.
- 8.5.6 The coiled wire, whether a single piece or cut pieces, shall be securely tied and covered with plastic sheeting or a plastic bag to protect the wire from inclement conditions.
- 8.6 If it becomes necessary to remove any additional wires from a tendon for physical testing, this procedure shall be followed to include the additional documentation. For example, Broken Wires or wires with Active Corrosion may be instructed to be removed by TMI Engineering.
- 8.7 **QCD** Each wire that has been removed for physical testing during this surveillance shall be documented for location of removal on Data Sheet in TMI Procedure 1301-9.1 Rev 23, using the appropriate Code Symbol. Document the posting of this information on Data Sheet 10.2.
- 8.8 **<u>QCD</u>** Document the identification and recalibration date of the measuring device and the wire Pulling Ram, if used, on Data Sheet 10.2.

9.0 DOCUMENTATION

- 9.1 The items requiring documentation in this procedure shall be documented on Data Sheet 10.2.
- 9.2 Some information documented on Data Sheet 10.2 shall require subsequent posting to Data Sheet in TMI Procedure 1301-9.1 Rev 23 and to Data Sheet 10.3 of PSC Procedure SQ 10.3.
- 9.3 The Data Sheet references the applicable Section or Step number of the procedure for each <u>QCD</u> or <u>HOLD POINT</u>.

10.0 ATTACHMENTS

10.1 Data Sheet 10.2

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PRECISION SHATEHCLANCE				EDURE SQ10. VIRE REMOVA Data Sheet 10. 09/03/1 Page 1 of Revision
Project: TMI 40 TH YEAR TENDON SUR	VEILLANCE		UNIT 1	
Fendon No.:	Tendon End:	SI	hop 🗌 Fie	ld
	WIRE REMOVAL INS	PECTION		
(8.5.4.1.1) Document the Corrosion Category for (For Corrosion Level C document condition on ar (8.5.4.3.1) Document the total length of the wire Buttonhead End	each 10' of wire in the increm NCR.		ies described in PS ☐ YES NCR# ☐ NO [C hile to construct and the state ,
**************************************	***************	20'	*******	30'
30' 40	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	50'	~~~~~	60'
60' 70	**************	80'		* * * * * * * 90'
90' 10	0,	110'	~~~~~~	120'
* * * * * * * * * * * * * * * * * * *			********	150'
150' 16	······	170'	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	180'
180' 19	0' 	* * * * * * * * * * * * * * * * * * *		210'
		230'	~~~~~~	240'
210' 22	U	230		
240' 25		260'	••••••	270'
	0' 	260'	~~~~~	270'
240' 25 270' 28 >>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	10' 10' 10' 5000000000000000000000000000	260' 290' 00000000000000000000000000000000	Cut End	270' 300'
240' 25 270' 28	0'	260' 290' CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC	Cut End	270' 300'
240' 25 270' 28 300' 31 (8.5.4.6.2) Was the wire cut for samples: ☐ NO	0' 0' 0' □ YES document the ar Data Sheet 8.0, ANCHORAG	260' 290' 290' 290' 290' 290' 290' 290' 29	Cut End	270' 300'
240' 25 270' 28 300' 31 (8.5.4.6.2) Was the wire cut for samples: \Box NO (8.7) Document the location of wire removed on	0' 0' 0' □ YES document the ar Data Sheet 8.0, ANCHORAG	260' 290' 290' 290' 290' 290' 290' 290' 29	Cut End	270' 300'
240' 25 270' 28 300' 31 (8.5.4.6.2) Was the wire cut for samples: NO (8.7) Document the location of wire removed on (8.8) Measuring Device:	0' 0' 0' □ YES document the ar Data Sheet 8.0, ANCHORAG	260' 290' 290' 290' 290' 290' 290' 290' 29	Cut End	270' 300'

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N1091 PSC PROCEDURE SQ 10.3 TESTING TENDON WIRES 09/03/13 Page 1 of 2 Revision 0

UNIT 1 (40	EXELON E MILE ISLAND O TH YEAR) PHYSICAL DING TENDON SURVEILLAN	CE
IN-SER	VEILLANCE CORPORATION VICE INSPECTION ONTROL PROCEDURE	ž
TESTIN	G TENDON WIRES	
A	G TENDON WIRES Q.C. INSPECTOR	09/03/13
TESTIN Mulisa Lara Prepared by		09/03/13 Date
Melisa Lara	Q.C. INSPECTOR	
Mehisa Lara Prepared by Gerald F. Bussone	Q.C. INSPECTOR Title	Date
Mulissa Lara Prepared by	Q.C. INSPECTOR Title Q.A. MANAGER	Date 09/03/13



N1091 PSC PROCEDURE SQ 10.3 TESTING TENDON WIRES 09/03/13 Page 2 of 2 Revision 0

1.0 PURPOSE

1.1 This procedure will establish the requirements for the Physical Testing of tendon wires removed from Post-Tensioning System Tendons, during the 40th Year In-Service-Inspections (surveillance) of the Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 SCOPE

- 2.1 The intention of this procedure is to provide the means of physically testing an Acceptable Wire removed from a tendon. However, this Procedure shall also apply for the physical testing of wires which may have been found to be Broken or in an Unacceptable Category of Corrosion.
- 2.2 An approved Test Laboratory will be utilized for the physical testing.
- 2.3 Testing is to be done per the requirements of ASTM A370 as noted in ASTM A421.
- 2.4 The Laboratory that performs the testing shall be responsible for controlling the samples, performing the testing, documenting the testing on Laboratory letterhead stationery and submitting the reports to:

PRECISION SURVEILLANCE CORPORATION 3468 Watling Road East Chicago, IN 46312 Attention: Quality Assurance

- 2.4.1 The Laboratory shall further be responsible to utilize trained personnel for the testing and maintain the calibrated status, traceable to the NIST, for all test or measuring devices that may be used in providing test results.
- 2.4.2 The Laboratory shall provide open access for inspection, survey or audit, as the need might arise, to PSC or its customers.
- 2.5 The PSC Quality Assurance Organization shall be responsible for the qualification of Laboratory sources.
- 2.6 Where specified in the Contract Documents, the Owner or his Agent shall have the right of approval for Laboratory sources.
- 2.7 The PSC Quality Control/Quality Assurance and/or Engineering Department shall review the reports for accuracy and content and for evaluation of the acceptability of those results.
- 2.7.1 This report shall be submitted to the Owner or his Agent with the final Surveillance Report.

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NCE CORPORATION SPECTION L PROCEDURE	· ·
TY TEST	· ·
Q.C. INSPECTOR	09/03/13 Date
Q.A. MANAGER Title	09/03/13 Date
PRESIDENT	09/03/13 Date
	Title Q.A. MANAGER Title PRESIDENT



N1091 PSC PROCEDURE SQ 10.5 CONTINUITY TEST 09/03/13 Page 2 of 5 Revision 0

1.0 PURPOSE

1.1 This procedure will establish the requirements for performing a Continuity Test of tendon wires for purposes of visual inspection and evaluation of, usually, Protruding/Unseated tendon wires for Post-Tensioning System Tendons, during the 40th Year In-Service-Inspections (surveillance) of the Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 SCOPE

2.1 The Continuity Test may be performed at the request of TMI Engineering if additional tendon wires are found to be Protruding/Unseated since the original installation or previous surveillance during the Buttonhead Inspection of PSC Procedure SQ 8.0.

3.0 **RESPONSIBILITY**

- 3.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 3.2 As stated in PSC Procedure QA 4.0.

4.0 QUALIFICATIONS

4.1 As stated in PSC Procedure QA 4.1.

5.0 QUALITY CONTROL

5.1 This procedure contains no <u>HOLD POINTS</u>. All Quality Control Documentation (QCD) points shall only require documentation of information or evaluation data. The required information or evaluation data shall be documented on Data Sheet 10.5.

6.0 EQUIPMENT

6.1 Equipment needed for the continuity test includes a tapeline, the pulling device and jacks or hoisting equipment, calibrated hydraulic devices and gauges.

7.0 PRECAUTIONS

• CAUTION - WHEN PULLING INDIVIDUAL WIRES, NEVER EXCEED 80% OF THE GUARANTEED MINIMUM ULTIMATE STRENGTH OF THAT WIRE WHEN PULLING WITH THE PULLING DEVICE – 9,425 POUNDS.

8.0 PREREQUISITES

- 8.1 The Grease Cap will be removed and grease samples taken.
- 8.2 The Anchorage Inspection will be complete, with protruding wires in evidence.



- 8.3 The tendon will be detensioned; it has been monitored for forces.
- 8.4 Each wire that was determined to be Protruding/Unseated as a result of the Buttonhead Inspection of TMI Procedure 1301-9.1 Rev 23 will be adequately identified either by marking, tagging or reference to Data Sheet.
- 8.5 The anchorages at each end of the tendon will be pushed back about 12 inches.
- 8.6 **QCD** Document the tendon identification, Unit # and tendon end on Data Sheet 10.5.

9.0 CONTINUITY TEST

- 9.1 The Protruding/Unseated wire shall be located.
- 9.1.1 <u>QCD</u> Document the location of each wire by marking it on the appropriate anchorhead sketch. Number each mark corresponding with the wire numbers in the table so as to identify which data is for each wire tested. If more wires need to be tested on one tendon than will fit on Data Sheet 10.5 it will be acceptable to use additional sheets and continue the sequential numbering so as not to reuse any numbers.
- 9.2 The Tendon Surveillance Wire Puller shown in Figure 1 of this procedure shall be attached to the wire to be tested.
- 9.3 The wire shall be pulled with the Wire Puller using as little force as possible, but not to exceed 9,425 pounds.
- 9.3.1 If the wire cannot be moved by hand, it shall be acceptable to use any mechanical device to accomplish that purpose, such as a "Come-A-long", "Chain-Hoist", "Chain-Pawl" or hydraulic cylinder.
- 9.3.2 It is unlikely that anything but the hydraulic cylinder will be able to exert such an amount of force so as to yield or break the wire. Therefore, hydraulic devices shall be controlled for force through a calibrated gauge or controlled for maximum force through a locking valve to control the amount of pressure to be exerted.
- 9.3.3 There remains a possibility that a limited force might not move the wire. It may be possible to break that wire loose with force in excess of 9,425 pounds. This attempt shall only be undertaken with the mutual consent of TMI Engineering responsible for the In-Service Inspection and the PSC Construction Manager.
- 9.3.3.1 If it is decided to exceed the control force, the amount of force used to move that wire shall be documented and evaluated for impact on the strength of the wire and the force to be applied to the Retensioning of the tendon.

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- 9.3.3.2 <u>QCD</u> Document the maximum force used to move the wire on Data Sheet 10.5, if over 9,425 pounds.
- 9.4 The wire shall be considered continuous if it can be observed to move at the opposite end of the tendon.
- 9.4.1 **QCD** Document that wire as continuous on Data Sheet 10.5.
- 9.5 If the wire cannot be observed to be moving, it could be broken and the pulling shall continue until that wire is removed.
- 9.5.1 <u>QCD</u> Document that wire as discontinuous on Data Sheet 10.5. As the wire is drawn it shall be checked for corrosion condition and to determine the cause of breakage, if possible. Document the Category of Corrosion of the wire using Table 1 in SQ 8.0. Also document, where possible, the reason for breaking.
- 9.5.2 <u>QCD</u> If the wire is broken, it shall be shown as broken on Data Sheet 8.0 and added to the total of Broken/Missing Wires and the Code Symbol modified to reflect that fact.
- 9.5.2.1 If any or all of the Protruding/Unseated wires since the original installation or previous surveillance are found to be broken and when added to the amount of Broken/Missing Wires on Data Sheet totals 1 or more, it shall be necessary to notify TMI Engineering of this condition in accordance with the requirements of TMI Procedure 1301-9.1 Rev 23. It shall be acceptable to continue working and notify TMI Engineering at the earliest opportunity, but within 24 hours of discovery.
- 9.5.2.2 If any or all the Protruding/Unseated wires have been determined to be continuous, each shall be re-inspected for Protrusion after Retensioning to see if they have seated themselves. An evaluation of that condition shall be performed after Retensioning.
- 9.5.2.3 <u>QCD</u> If any or all the Protruding/Unseated wires remain unseated after Retensioning, it shall be reported as required of TMI Procedure 1301-9.1 Rev 23.
- 9.6 <u>QCD</u> Document any comments identifying any nonconforming or adverse observations or conditions

10.0 DOCUMENTATION

10.1 The items requiring documentation shall be documented on Data Sheet 10.5 or to TMI Data Sheet of TMI Procedure 1301-9.1 Rev 23.





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11.0 ATTACHMENTS

- 11.1 Data Sheet 10.5
- 11.2 Figure 1.0 Tendon Wire Puller



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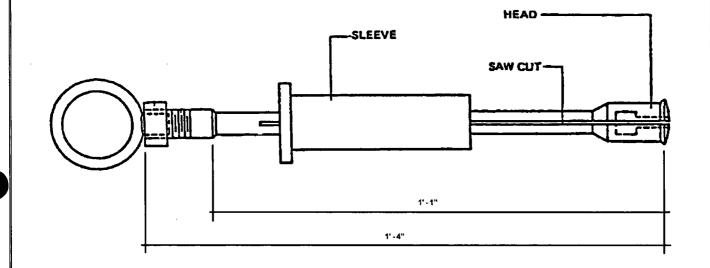
Projec	t: <u>TMI 40TH</u>	YEAR TENDON	SURVEILLA	NCE		1	
(8.6)Tendon No.:			Tendo	n End:		🗌 Shop 🔄 Fiel	ld .
		<u> </u>	CONTINU	ITY TEST DO	CUMENTATION	an an ann a san <u>an</u> airte anna an an a	
(9.1.1) Wire No.	(9.3.3.2) Force if greater than 9,425 lbs	Continuous (9.4.1) (9.5.1) Yes No	(9.5.1) Corrosion Condition	(9.5.2.3) Broken & Posted to D.S. 8.0	(9.6)	Comments	QC Signoff
					-		
						· · ·	
ld	•					a number corresponding to the identify any nonconforming cor	
				Row V 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 15	7 8 11 12 13 14 13 14 13 14 13 14 13 14 13 14 13 14 13 14 13 7	This form can be used to 17 individual wires i fashion. If more than 1 verified or if the entire verified, then a row by inspection shall be per Orient the anchorage the Heat Code Identifie note the wire number in each row starting fro side of each row. The comment area sh identify particular wire inspection remarks.	n columnar 7 are to be row is to be row formed. sketch with cation and as it appears om the left
	· · · · · · · · · · · · · · · · · · ·				Level:		
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N1091 PSC PROCEDURE SQ 10.5 CONTINUITY TEST Figure 1.0 09/03/13 Page 1 of 1 Revision 0

Figure 1.0 – Tendon Wire Puller

Figure 1.0 is a represented sample of a wire puller and is not a quality controlled device. The actual wire puller may vary somewhat from this configuration.





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THRE UNIT 1 (40 CONTAINMENT BUILE	EXELON E MILE ISLAND TH YEAR) PHYSICAL DING TENDON SURVEILLAN	CE
IN-SER\	/EILLANCE CORPORATION /ICE INSPECTION ONTROL PROCEDURE	·
RE-IENS	IONING TENDONS	
	Q.C. INSPECTOR	09/03/13
Mulisa Jara Prepared by		<i>09/03/13</i> Date
Melissa Lara	Q.C. INSPECTOR	. <u></u>
Melissa Lara Prepared by	Q.C. INSPECTOR Title	Date
Melissa Lara Prepared by Gerald F. Bussone	Q.C. INSPECTOR Title Q.A. MANAGER	Date 09/03/13
Mehisa Lara Prepared by Gerald F. Bussone	Q.C. INSPECTOR Title Q.A. MANAGER Title	Date 09/03/13 Date



1.0 PURPOSE

1.1 This procedure will establish the requirements for Retensioning Tendons after visual inspection, testing and evaluation during the In-Service Inspections (Surveillances) of the Post-Tensioning System Tendons at Exelon's Three Mile Island Nuclear Plant-Unit 1.

2.0 **RESPONSIBILITY**

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 As stated in PSC Procedure QA 4.0.

3.0 QUALIFICATIONS

3.1 As stated in PSC Procedure QA 4.1.

4.0 EQUIPMENT

4.1 The gauges and test equipment necessary for the quality control activities will be itemized in PSC Procedure SQ 4.0.

5.0 PRECAUTIONS

5.1 Review the I.S.I. Tendon Surveillance Program Safety Comments for the items that shall apply both for tendon force control and personnel safety.

6.0 QUALITY CONTROL

6.1 This procedure contains <u>HOLD POINTS</u>. The work shall not progress past or through a <u>HOLD POINT</u> without a sign-off from the QC Inspector. All Quality Control Documentation (<u>QCD</u>) points shall only require documentation of information or evaluation data. The sign-off's and required information or evaluation data shall be documented on Data Sheet 11.0 or Data Sheet 9.0 of PSC Procedure SQ 9.0.

7.0 PREREQUISITES

- 7.1 All inspections required by PSC Procedure SQ 2.0 will be complete and acceptable.
- 7.2 Ensure that coupler strength verification (SQ 7.1) has been completed for that coupler/anchorage combination.

8.0 MEASUREMENTS

8.1 <u>STEEL RULERS</u>



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- 8.1.1 Measurements of tendon elongation or shim stack height shall be performed with calibrated steel rulers graduated in tenths of an inch (0.1"). The measurements shall be recorded to the nearest 0.05". See Sketch 7.0 at the end of this procedure.
- 8.1.2 A steel caliper may be used to take the elongation measurement. One caliper blade shall be placed against the bearing plate and the other blade placed against the bottom of the anchorhead. The caliper blades shall be parallel to the tendon during measurement. When the parallel condition is established the blades shall be locked and the caliper withdrawn without disturbing the blade setting. The caliper blades shall be placed on the steel ruler and the dimension determined. See Sketch 7.0 at the end of this procedure.
- 8.1.3 Tendon elongation measurement shall be performed by measuring the distance between the bearing plate and the bottom of the anchorhead for each end of the tendon.

8.2 PRESSURE GAUGES

- 8.2.1 Measurements of ram pressure (tendon force) shall be measured by calibrated pressure gauges capable of being read directly to 20 psig.
- 8.2.2 View the gauge face from a plane of view directly in front of the indicator needle to avoid parallax errors.
- 8.2.3 Gauge readings shall be interpolated to the nearest 10 psi.
- 8.2.4 All pressure gauges used shall have automatic compensation for temperature variations between gauge calibration and gauge use during surveillance.

9.0 RETENSIONING TENDONS

- 9.1 The intention of this operation is to stress (retension) those tendons that were detensioned for wire removal and testing during this surveillance and any other tendons that may have been detensioned for evaluation.
- 9.2 Retensioning of tendons shall be performed on both ends of a hoop and dome tendon, or, single end of a vertical tendon which are only retensioned from the top end. Where it is not possible to perform simultaneous stressing of a tendon, Exelon Engineering shall be notified in writing to provide resolution for such conditions. Adequate communication shall be maintained between both ends of the tendon during the taking of liftoff readings for simultaneous stressing operations.
- 9.2.1 All data shall be documented on Data Sheet 11.0.
- 9.3 **<u>QCD</u>** Document the tendon identification, unit # and tendon end on Data Sheet 11.0.



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- 9.4 <u>QCD</u>- Document the exterior surface temperature near the tendon, ambient air temperature, identification and calibrated status of the thermometer(s) on Data Sheet 11.0.
- 9.5 <u>**HOLD POINT</u>** The anchorhead and stressing adaptor threads are to be inspected for dirt, burrs, nicks, and damaged threads, if any condition precludes proper coupling the condition should be corrected after notifying Exelon Engineering in writing. Anchorhead threads shall be inspected for deformation before and after any stressing operation and if any deformation is detected Exelon Engineering is to be notified in writing. Document acceptance on Data Sheet 11.0.</u>
- 9.6 **QCD-** Document the amount of effective wires in each end of the tendon. Refer to Data Sheet 8.0 (12.5) for each tendon end. Document on Data Sheet 11.0.
- 9.7 <u>**HOLD POINT**</u> Couple the rams to each anchorhead on that tendon (for single end stressed vertical tendons only the top anchorhead is used). Document on Data Sheet 11.0 that the stressing coupler is evenly aligned on the anchorhead washer and that full thread engagement is obtained.
- 9.7.1 Be sure that buttonheads do not protrude a significant distance, about one inch or more, above the anchorage face. Otherwise full engagement of the stressing adaptor may bend the wire over before the buttonheads seat on the anchorage face.
- 9.7.1.1 If wires protrude more than 1 inch the stressing adaptor may be coupled a minimum of 2 inches engagement and the tendon stressed to PTF to seat wires.
- 9.7.1.2 The stressing adaptor must then be removed to ensure protruding wires are less than 1 inch.
- 9.7.1.3 Recouple and procede.
- 9.7.2 Be sure that the anchorage does not recess itself inside the stressing adaptor during coupling. Otherwise the stressing adaptor will seat on the shim stack and will not be capable of being unthreaded from the anchorage. Anchorage should protrude a maximum of ¼" from coupler face.
- 9.7.3 <u>QCD</u>- Document the ram and pressure gauge identification number, calibration due date of each and the Ram Area and Calibration Constant (K). Document on Data Sheet 11.0.
- 9.8 Determine the Pretensioning Force, Overstress Force and Lock-off (seating) Force and pressure values for that tendon based on the following definitions:



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- 9.8.1 <u>Pretensioning Force (PTF)</u> That force necessary to bring the tendon into a lightly stressed condition to remove slack and seat the button heads. This force establishes the base for elongation measurement. The Pretensioning Force values for each tendon to be re-tensioned shall be seen in the Re-tensioning Data, PSC Procedure SQ 11.1.
- 9.8.2 <u>Overstress Force (OSF)</u> That force at which maximum elongation is determined. Overstress values for each tendon to be re-tensioned shall be found in the Retensioning data, PSC Procedure SQ 11.1.
- 9.8.3 <u>Lock-off Force (LOF)</u> That force at which the tendon load is transferred to the shim stack from the ram. If the detensioned tendon had an accepted lift-off force greater than its Predicted Force obtained in PSC Procedure SQ 9.0 the Lock-Off Force shall be the as found lift-off force within a tolerance of minus 0% and plus 6%. If the detensioned tendon had a lift-off force less than its Predicted Force obtained in PSC Procedure SQ 9.0 the Lock-Off Force shall be the Predicted Force from PSC Procedure SQ 9.1 within a tolerance of minus 0% and plus 6%. Lock-off Force is not to exceed 70% of G.U.T.S. (1394 kips for a 169 wire tendon, or 8.25 kips per wire).
- 9.8.4 <u>QCD</u>- Document the calculated PTF, Step 1 (800 Kips), Step 2 (1200 Kips), LOF and OSF forces and pressures. Document the Calculated Elongation for Step 1, Step 2, and Overstress from PSC Procedure SQ 11.1 on Data Sheet 11.0.
- 9.8.5 The tendon shall never be stressed beyond 80% of the Minimum Guaranteed Ultimate Strength (GUTS) of the effective wires remaining in that tendon.

CAUTION-ONCE ACUTAL STRESSING BEGINS, THE RAM MUST NEVER BE EXTENDED TO THE FULL LIMIT OF ITS STROKE. THE EXTENSION SHOULD BE AT LEAST 1/2" LESS THAN THE FULL STROKE OF THE RAM.

9.9 TENDON STRESSING (RETENSIONING)

9.9.1 The shim space at each end of the tendon shall be approximately equalized by pressurizing the stressing rams. (Teamwork is especially important from now on until the stressing is completed.) The two stressing crews shall verbally confirm the equalization of the space, or adjust it as necessary. This distance from the bearing plate to the back of the anchorhead should be approximately equal at both ends.



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- 9.9.2 During the application of force to a tendon that is being simultaneously stressed from both ends, the pressure at one end of the tendon shall not exceed the other by more than 1000 psi. For example, if End "A" has moved to 2000 psi, the pressure at that end shall be held until the Opposite or "B" End has achieved that value, then both shall progress to the next value. If different size Rams/Jacks are being used, contact PSC Engineering or QA for maximum variance.
- 9.9.3 It may be necessary to multiple stage stress the tendon if the ram stroke is too short to accommodate reaching overstress. Stage stressing is accomplished by shimming the load at either end of the tendon when the stroke limit is reached. The pullrod shall be adjusted for the next stressing stage and stressing shall continue as cited below.
- 9.9.4 Once the space is approximately equalized at each end of the tendon, the ram or rams shall be pressurized to the Pre-tensioning Force (PTF) for the amount of effective wires remaining in the tendon.
- 9.9.4.1 <u>QCD</u>- Document the actual force in kips and pressure in psi and the Actual Elongation measured at PTF. Document on Data Sheet 11.0.
- 9.9.5 Continue pressurizing the ram past the PTF to Step 1 (800 kips).
- 9.9.5.1 <u>QCD</u>- Document the Actual Elongation measured at Step 1 and the Actual Force in kips and pressure in psi observed at Step 1. Document on Data Sheet 11.0.
- 9.9.6 Continue pressurizing the ram past Step 1 to Step 2 (1200 kips).
- 9.9.6.1 **QCD** Document the Actual Elongation measured at step 2 and the Actual Force in kips and pressure in psi observed at Step 2. Document on Data Sheet 11.0.
- 9.9.7 Continue stressing to the Overstress Force (OSF).
- 9.9.7.1 <u>QCD</u>- Document the Actual Overstress Pressure in psi and Force in kips reached and measure and document the elongation of the tendon at OSF. Document on Data Sheet 11.0.
- 9.9.8 <u>QCD</u> Calculate Actual Elongation by subtracting the elongation at PTF (9.9.4.1) from the elongation at OSF (9.9.7.1). Document on Data Sheet 11.0.
- 9.9.9 **QCD** Document the other end tendon elongation on Data Sheet 11.0.
- 9.9.10 <u>QCD</u> Calculate and document the Total Tendon Elongation by adding the elongation from both ends together. Document on Data Sheet 11.0.



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9.9.11 **HOLD POINT** – Calculate the percent variation between the total tendon elongation during surveillance and the total tendon elongation at original installation using the following formula: TotalTendonElongation(Surveillance) – TotalTendonElongation(Original) ×100% TotalTendonElongation(Original) 9.9.12 The Total Tendon Elongation of the tendon during the Surveillance shall be compared to the Original Installation. Percent variation shall not exceed plus or minus 10%. 9.9.12.1 QCD- Document the percent of variation, and document the identification and recalibration date of the measuring device. Document on Data Sheet 11.0. 9.9.12.2 If the Total Tendon Elongation, when compared to the original installation elongation is not within the plus or minus 10% tolerance, the shims shall be removed and the load shall be reduced to zero and Sections 9.9.1 through 9.9.12.1 repeated. If the elongation does not meet the specified tolerance after the second restressing, the tendon shall be locked off at the required force and Exelon Engineering shall be notified of the deficiency as required by Section 10.0 of this Procedure. 9.9.12.3 QCD- Document the acceptance or non-acceptance of the elongation and the notification of Exelon Engineering, if applicable. Document on Data Sheet 11.0. If the elongation variation is acceptable, the work shall continue as follows: 9.9.12.4 Depressurize the ram reducing the force from overstress to a point about 100 kips above Lock-off but below overstress and prepare to install the shims. As a guide, the original shim stack height should be considered as the starting point for achieving the restoration of force. 9.9.12.5 At any point prior to or during stressing, the field crew shall prepare shim stacks of uniform thicknesses, so that when the shims are placed, the height differential between individual stacks shall not exceed 1/16 inches, thereby maintaining the integrity of the established parallelism between the bearing plate and anchorhead. Badly deformed shims should be replaced by new or acceptable shims of equivalent thickness. 9.9.12.6 After the Target Lock-off point has been reached or slightly higher, the shims shall be placed between the bearing plate and anchorage in diametrically opposite pairs. Continue filling this gap with shims until a small enough space remains so that the anchorhead can be lowered to the shim stack placing the load transfer within the required lock-off tolerance.



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9.9.12.7 <u>HOLD POINT</u> – When inserting split shims, the three inch (3") thick shim is adjacent to the anchorhead and the one inch (1") thick shim is adjacent to the bearing plate. Incremental shims are inserted between the 3 inch and 1 inch shims. The difference in height of the stacks of shim halves shall not differ by more than 1/16". While the shims are being placed, the space between the each shim halve for the first shims in direct contact with the anchorage shall not exceed a space of 1/4 inch on either side of the shims. The remaining shims in the shim stack may be placed with a larger spacing but shall not exceed 1/2 inch on either side of the shims. No part of the anchorhead shall overhang the shim stack.

9.10 LOCK-OFF VERIFICATION

- 9.10.1 To assure that the correct forces have been applied to the tendon, the following lock-off verification shall be performed.
- 9.10.2 Insert two feeler gages or shim stock, about 0.030" in thickness, between the anchorhead and shim. The feeler gages should be located about 180 degrees apart and approximately centered.
- 9.10.3 Reduce the ram pressure until the load is transferred on the shim stack. It shall not be necessary to return to zero gauge pressure, but at least 2000 psi less than the pressure that was needed to insert the shim stock.
- 9.10.4 Gradually pressurize the ram while pulling the feeler gages. The point at which the feeler gauge comes loose and can be withdrawn is the Lock-off Reading.
- 9.10.5 <u>**QCD**</u> Document the acceptable lock-off tolerance range which is calculated in accordance with section 9.8.3 of this procedure. Indicate with a check which option is being used. Document on Data Sheet 11.0.
- 9.10.6 <u>QCD</u>- Document the pressure for each Lock-off Reading of each shim stack. Place a circle around that Lock-off Reading that was the last to have the feeler gauge or shim removed. (The last shim stack to come loose.) Do not intermix the values for the shim stacks. Stack 1 will always be Stack 1. Document on Data Sheet 11.0.
- 9.10.7 Repeat sections 9.10.1 through 9.10.5 until 3 consecutive circled Lock-off readings have been taken, which should be within 25 kips of each other, if this cannot be achieved the feeler gauges may be repositioned and readings attempted again.
- 9.10.8 <u>QCD</u>- Post the Circled Lock-off Readings into the Circled Lock-off Reading Column. It may be possible to have the Lock-off occur in each shim stack. Add the Circled Lock-off Values and divide by 3 to get the Actual End Average. Record the Actual End Average. Document on Data Sheet 11.0.



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- 9.10.9 <u>QCD</u> Enter the Actual End Average from the opposite end of the tendon. Document on Data Sheet 11.0.
- 9.10.10 <u>QCD</u> Calculate the Average Lock-off Value (ALV) for this tendon by adding the lock-off forces from both ends (9.10.8 and 9.10.9) and dividing by 2 to get the average. Document on Data Sheet 11.0.
- 9.10.11 <u>HOLD POINT</u> On Data Sheet 11.0, document the acceptance or nonacceptance of the ALV in accordance with section 9.8.3 of this procedure. If the requirements cannot be met, notify Exelon Engineering by a Nonconformance Report.
- 9.10.12 If the Lock-off readings are acceptable, the load shall be transferred to the shim stack and the ram pressure reduced to zero.
- 9.10.13 With the ram at zero force or pressure, it shall be uncoupled from the anchorage.
- 9.10.14 A visual examination of the tendon just retensioned, shall be performed to determine if any wires have broken during stressing. The number of additional wires or buttonheads that have broken or are missing shall be documented.
- 9.10.15 <u>QCD</u> Document additional broken/missing wires/buttonheads on Data Sheet 11.0 for later transfer to Data Sheet 8.0. Document on Data Sheet 11.0
- 9.10.16 **<u>QCD</u>** Document additional Protruding/Unseated wires for later transfer to Data Sheet 8.0. Document on Data Sheet 11.0.
- 9.10.17 **<u>QCD</u>** Document the shim stack height for the final accepted Lock-off reading.
- 9.10.18 The Re-tensioning is now concluded and grease cap replacement shall follow.

10.0 NOTIFICATION

- 10.1 Exelon Engineering shall be formally notified when each one or more of the following conditions are detected during retensioning of tendons.
- 10.2 If coupling to a certain tendon or simultaneous stressing from both ends of a hoop or dome tendon is not possible, notify Exelon Engineering in writing.
- 10.3 If one or more additional broken/missing buttonheads/wires are detected, Exelon Engineering shall be notified with a Nonconformance Report (NCR).
- 10.4 If the tendon Lock-Off Force cannot be left within minus 0% or plus 6% of the force as stated in Section 9.8.3 of this Procedure, Exelon Engineering shall be notified by a nonconformance report.



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- 10.5 If the variation between the measured elongation at installation and the calculated measured elongation during surveillance exceeds plus or minus 10%, Exelon Engineering shall be notified with a nonconformance report.
- 10.6 If any deformation of anchorage threads are detected before or after any stressing operation, Exelon Engineering is to be notified with a nonconformance report.

11.0 DOCUMENTATION

- 11.1 The items requiring documentation in this procedure shall be documented on Data Sheet 11.0.
- 11.2 The Data Sheet references the applicable section or step number of this procedure for each QCD or <u>HOLD POINT</u>.
- 11.3 Some information from Data Sheet 8.0 of PSC Procedure SQ 8.0, which has already been started for this tendon, shall require posting onto Data Sheet 11.0.
- 11.4 Some information from Data Sheet 11.0 shall require posting onto Data Sheet 8.0.

12.0 ATTACHMENTS

- 12.1 Data Sheet 11.0
- 12.2 Sketch 7.0

REP-1098-510 Appendix E, Page 32

PRECISION SURTENCEAN	CE			N1(RETE	OCEDURE SQ 11.0 INSION TENDONS A SHEET SQ 11.0 09/03/12 Page 1 of 2 Revision 0
Project: TMI 40 TH YEAF	R TENDON SURVEI			🗌 Unit	1 🗌 Uni	it 2
		Tendon End:			b ☐ Fie	ld .
(9.4) Temp. of Concrete:				Decel Dete		
Ambient Temp.:	°F Thermo	meter No.:		Recal Date	:	
(9.5) Anchorhead and Stressi	ng Adapter Threads:	Acceptable	🗌 Unac	ceptable		
	RETENSION	ING DOCUMEN	TATION			QC Signoffs
(9.6) Number of Effective Wire (9.7) Anchorhead and Stress (9.7.3) RAM ID: Gauge ID:	-	ent/Alignment :	(from Data	able 🗍 Unacceptab a: K	ole	
NOTE: Stress during Lift-Off (9.8.4) PTF = Step 1 = Step 2 = LOF = OSF =	kips Pressu kips Pressu	ure:	psi	Elongation: Elongation:	in.	
P = (<u>F – K)</u> x 1000 A	Key:	P = Gau K = Con (CAUTION	ce (kips) n Area (in ²) ige Pressure (psi) istant factor (kips) <u>v</u> : "K" constants can be or negative.)	either	

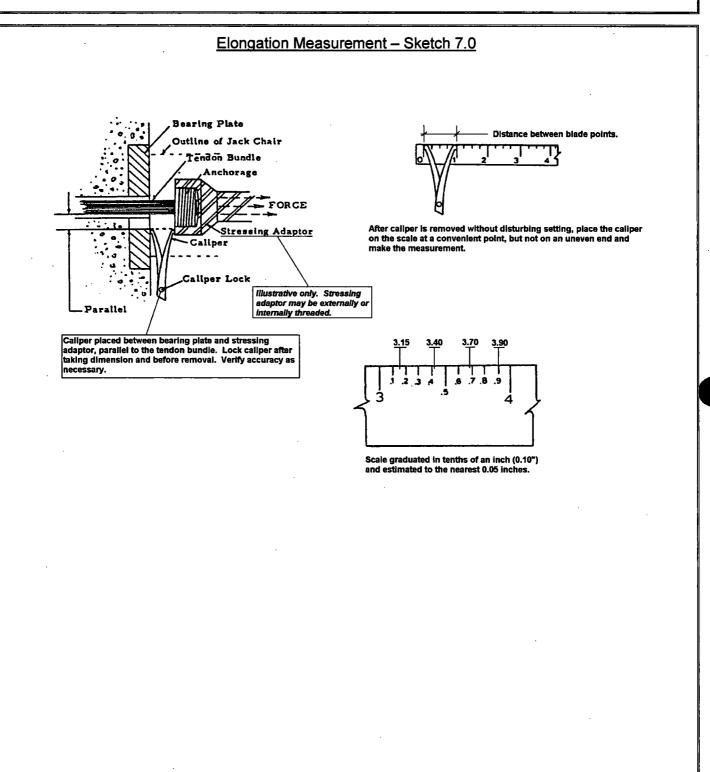


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Project:	TMI 40 TH YEAR TENDON SURVEILLANCE	_ 🗌 Unit 1 🗌 U	nit 2					
(9.3)Ten	ton Tendon End:	_ 🗌 Shop 🛛 🗍 F	ield					
	Actual Observed Force and Elongation Measurements using formula	below	QC Signoffs					
(9.9.4.1)	PTF = kips Pressure: psi Φ Elongation:	in	1					
(9.9.5.1)	Step 1 kips Pressure: psi Elongation:	in						
(9.9.6.1)	Step 2 kips Pressure: psi Elongation:	<u>in.</u>						
(9.9.7.1)	OSF = kips Pressure: psi Ø Elongation:	: <u>in.</u>						
	$F = \frac{A \times P}{1000} + K$							
(9.9.8)	② − ①= in. Elongation Value (this end)		1					
(9.9.9)	in. Elongation Value (opposite end)							
(9.9.10)	in. TOTAL Tendon Elongation Value							
(9.9.12.1)	Elongation % Ruler ID: Recal Date:							
(9.9.12.3)	Elongation Results Acceptable Unacceptable Customer Notified NCR No:							
Options	Original Lift-off Values from Data Sheet SQ 9.0							
A	Lift-off < Predicted Force Use Predicted Force - 0 + 6%							
B C	Lift-off > Predicted Force		· ·					
	Lift-off > 70% GUTS \Box Use 70% + 0 - 3% GUTS (effective wires)							
(9.10.5) L (DF Acceptable Range Min Max		1					
As foun	l lift-off/or predicted (highest): kips kips	<u> </u>						
	From:psiTo:ps	ii 						
(9.10.6) Ad	tual Lift-Off (9.10.	8) Circled Values						
	itack #1: 1) psi Stack #2: 1psi	1)psi						
		2)psi						
		3)psi						
	rce (this end): kips Actual Average:	psi						
(9.10.9) Force (opposite end): kips (9.10.10)Tendon ALV Force kips								
(9.10.11) ALV Acceptable: Yes No Customer Notified NCR No.:								
(9.10.15) /	(9.10.15) Additional broken/missing wires: 🛛 No 🗋 Yes Arnount:							
(9.10.16) /	Additional Protruding/Unseated wires: No Yes Amount: If Yes – Customer Notified NCR No.:							
(9.10.17) F	inal Shim Stack Height: #1: in. #2: in.	n.						
QC Revie	wed: Level:	Date:						

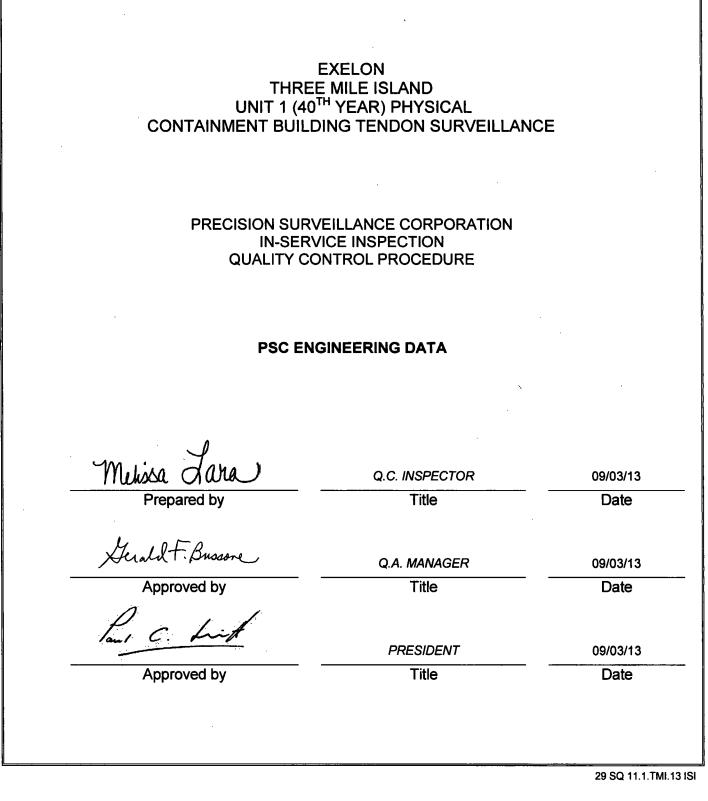


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1.0 PURPOSE

1.1 This procedure will establish the PSC Engineering requirements for the Retensioning of Tendons after the tendon has been Detensioned for purposes of Anchorage Inspection and Sample Wire Removal from the Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 SCOPE

- 2.1 The requirements for the Retensioning of Tendons have been described in TMI Procedure 1301-9.1 Rev 23. While there was some mention of the force values to be applied to a tendon in that Procedure that was only intended as general information. This Procedure will provide the required Engineering Data for the Retensioning operation.
- 2.2 The data shown herein shall establish the requirements for tendon elongation, PTF and OSF for tendon elongation during the Retensioning of Tendons and the Predicted Forces that affect each Surveillance Tendon.
- 2.2.1 PRETENSIONING FORCE (PTF)
- 2.2.1.1 The Pretensioning Force (PTF) removes the slack from the tendon and provides a baseline number for elongation measurement. The Table seen in Section 3 of this Procedure will provide the required data for the Retensioning of Tendons.

2.2.2 OVERSTRESS FORCE (OSF) - FOR ELONGATION

2.2.2.1 The Overstress Force for Elongations is that force which must be achieved in order to develop the final elongation measurement used in the comparison of actual tendon elongation to the original or calculated tendon elongation. The Overstress Force for this surveillance will be the same as used for the Original Installation adjusted for the remaining Effective Wires.

2.2.3 OVERSTRESS FORCE - DO NOT EXCEED

2.2.3.1 At no time shall any tendon be subjected to an Overstress Force which exceeds 1592 Kips for a 169 wire tendon. Tendons with less than 169 wires shall be reduced in force by 9.425 Kips for each wire less than 169.

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3.0 RETENSIONING DATA

3.1 TMI Unit 1 – Restressing Data – Original Scope Tendons

	PREVI	OUSLY	AT RETENSIONING					N
TENDON	ORIG PTF (KIPS)	ORIG OSF (KIPS)	NUMBER OF WIRES	NEW PTF (KIPS)	NEW OSF (KIPS)	800 KIPS (IN.)	1200 KIPS (IN.)	ORIGINAL ELGONATIC (IN.)
			168	207	1510	4.28	7.16	
D-237	208.3	1518.9	167	206	1501	4.31	7.22	9.4
			166	205	1492	4.35	7.27	
			168	207	1584	4.22	7.07	
H13-03	208.3	1593	167	206	1574	4.26	7.12	9.8
			166	205	1565	4.29	7.17	
			168	207	1464	5.80	9.72	
V-159	208.3	1472.8	167	206	1455	5.85	9.79	12.3
		L	166	205	1447	5.90	9.86	

3.2 <u>TMI Unit 1 – Restressing Data – Augmented Scope Tendons</u>

	PREVI	OUSLY	AT RETENSIONING					N
TENDON	ORIG PTF (KIPS)	ORIG OSF (KIPS)	NUMBER OF WIRES	NEW PTF (KIPS)	NEW OSF (KIPS)	800 KIPS (IN.)	1200 KIPS (IN.)	ORIGINAL ELGONATIC (IN.)
			168	199	1579	4.68	7.80	
H51-40	199.8	1588.7	167	197	1570	4.72	7.85	10.75
			166	196	1560	4.76	7.91	
			168	198	1577	4.80	7.99	
V-136	199.4	1586.6	167	197	1568	4.84	8.05	11
			166	196	1558	4.88	8.11	



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- 3.3 NOTES CONCERNING ELONGATION DATA
- 3.3.1 The tendons for this project were based on 169 wires.
- 3.3.2 Pretensioning Force (PTF) for purposes of elongation shall be as shown in the table above for a 168 or less wire tendon. For each wire less than shown above, reduce PTF proportionately for each tendon using the formula shown in Section 3.2.2 of this procedure.
- 3.3.3 Overstress Force (OSF) for purposes of elongation shall be as shown in the table above for a 168 wire or less wire tendon. For each wire less than shown above, reduce OSF proportionately for each tendon using the formula shown in Section 3.2.1 of this Procedure.
- 3.3.4 The Overstress (OSF) Elongation shown above is the Total Elongation for the tendon from Installation or Previous Surveillance. The total elongation from Installation or Previous Surveillance shall be compared to the Total Actual Measured Elongation during this Surveillance.
- 3.4 FORCES DURING SURVEILLANCE
- 3.4.1 Overstress (OSF) during Retensioning:

(OSF at Installation) × (# of Wires during Retension) #of Wires during Installation

3.2.2. Pre-Tensioning (PTF) during Retensioning:

(PTF at Installation) × (# of Wires during Retension) #of Wires during Installation

3.5 USE OF "K" (CONSTANT)

3.5.1 With the use of regression analysis for the calibration of ram area, as seen in the PSC Ram Calibration Procedure where error calculation is also considered within the computer program, the ram area no longer reflects the ram size, but instead provides an area measurement with a correction factor related to pressure. This correction factor becomes a "Constant" (K), related only to that ram being calculated for area. The constant is a factor that considers the amount of force necessary to overcome internal resistance. This Constant will vary from ram to ram and could be positive or negative; that is, it may have to be added or subtracted from the total force to provide the true actual force measurement, whether that force is Pre Tensioning Force, Over-Stress Force, or Lock-Off Force.

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3.6 FORMULA AND WORKING RELATIONSHIPS

3.6.1 The basic formula for determining stressing force or stressing pressure when three factors are known is:

$$F = \frac{A \times P}{1000} + K$$

Key: F = Force (kips) $A = Ram Area (in^2)$ P = Gauge Pressure (psi) K = Constant factor (kips)(CAUTION: "K" constants can be either positive or negative.)

3.6.2 Only P or F could be unknown and remain to be determined. The other three factors will always be provided before beginning the calculations.

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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE

PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE

GREASE CAP REPLACEMENT

Melissa Lara

Prepared by

Gerald F. Bussone Approved by

C. 1

Approved by

Q.C. INSPECTOR Title

Q.A. MANAGER

Title

09/03/13

Date

09/03/13

Date

09/03/13 Date

PRESIDENT Title

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N1091 PSC PROCEDURE SQ 12.0 REPLACE GREASE CAP 09/03/13 Page 2 of 6 Revision 0

1.0 PURPOSE

1.1 This procedure will establish the requirements for the Replacement of Grease Caps after visual inspection and evaluation has been completed for the tendon end anchor head, shims, bearing plates and wires during In-Service Inspections (surveillance) of Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 **RESPONSIBILITY**

- 2.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 2.2 Precision Surveillance Corporation Field Construction Personnel shall be responsible for the physical activities and recording of documentation associated with this procedure, as an option a Precision Surveillance Corporation QC Inspector may record the documentation.

3.0 QUALIFICATIONS

3.1 Precision Surveillance Corporation Field Construction Personnel shall be fit by skill, training and/or experience to perform these duties.

4.0 EQUIPMENT

4.1 There is no need for Quality control equipment for this procedure.

5.0 QUALITY CONTROL

5.1 There are no Quality Control Documentation (QCD) points or HOLD Points in this procedure.

6.0 PRECAUTIONS

6.1 Be prepared to support the weight of the grease cap.

7.0 PREREQUISITES

- 7.1 All other work, inspections and evaluations shall be completed with the exception of Grease Replacement.
- 7.2 Prior to replacement of grease caps record on Data Sheet SQ 12.0 the information required for tendon number, tendon end and date of grease cap replacement.

8.0 GREASE CAP REPLACEMENT

- 8.1 Tendon end caps are being installed per TMI Procedure 1410-Y-83.
- 8.2 Installation of Hoop, Dome and lower Vertical caps.



- 8.2.1 Only minor cleaning and brushing should be necessary to prepare the bearing plate and grease cap for remounting to the bearing plate or anchorage.
- 8.2.2 Prepare bearing plate surface by cleaning with rags and solvent. If detrimental foreign matter such as mill scale, rust, and dirt is detected on the gasket bearing surface of the plate, and power tool cleaning is required, then:
- 8.2.2.1 Make suitable provisions to protect the tendon wires and anchor head threads from accidental rubbing, cutting, or scratching by coming into contact with the power tool's rotating wire brushes and/or abrasive disks. Sheet metal shrouds around the tendon and end anchorage may be necessary.
- 8.2.2.2 Take precautions to keep dirt and other foreign material out of the tendon, and from the inside of the trumpet and conduit.
- 8.2.2.3 Power tools should remove loose mill scale, loose rust, loose or flaking paint, etc. Surfaces must be clean and smooth but not necessarily burnished after using power tools.
- 8.2.2.4 Remove sharp edges, and smooth down remaining mill scale to a "featheredge".
- 8.2.3 Fill scratches, nicks, and other sharp depressions in the gasket bearing surface with nonmetallic epoxy, such as "Belzona" epoxy if approved by TMI Engineering. Use of epoxy shall be according to manufacture's application instructions.
- 8.2.3.1 Smooth out epoxy to prevent grease leakage under the gasket.
- 8.2.4 Remove all dust and loose mater from the vicinity of the tendon and entrance to the trumplet.
- 8.2.5 Clean any foreign material from the threaded bearing plate grease cap mounting holes.
- 8.2.6 Smear, swab or brush a coating of grease over all the exposed portions of the anchor head, bearing plate, shims, buttonheads and wires, if not previously done in another operation or if needed.
- 8.2.7 A thread chaser or tap may be required to clear the threads of the bearing plate's grease cap mounting holes so that the bolts can be sufficiently tightened to bottom in the threaded holes.
- 8.2.8 Clean and dry the flange and gasket sealing surface of the grease cap.
- 8.2.9 Record on Data Sheet SQ 12.0 that the bearing plate, grease cap, and gasket mating surfaces and bolt holes have been properly prepared and that foreign material has been controlled so as not to enter the tendon void.



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- 8.2.10 On hoop and dome caps where the original through-cap mounting bolting is being replaced with hold down clamps the through-cap holes shall be plugged with Pop-A-Plugs.
- 8.2.11 With the grease cap on end, place a new gasket on the grease cap. Pliobond or a similar industrial adhesive, as approved by TMI Engineering, may be used to hold the gasket in place.
- 8.2.12 New gaskets shall be used in the final placement of the grease cap. Old or used gaskets may be used during temporary placement of the grease caps.
- 8.2.13 Place the gasket retainer (verticals only) and grease cap over the tendon end and align the cap by placing it over the two 1" aligning pins. If slotted aligning pins are used, insert the tapered wedges through the slots in the aligning pins to hold the cap in place. Be sure the gasket is in place and not pinched between the gasket retainer and the bearing plate. For vertical tendons, the wedges and pins need not always be used. The grease cap bolts may be used at this time while using a hoisting device to hold the cap in place temporarily.
- 8.2.14 Place 1 washer, standard or hardened, over each of the 1" bolts and put the bolts into the 2 remaining holes of the bearing plate. Tighten by hand until seated. Remove the aligning pins and replace them with two bolts and washers.
- 8.2.15 Tighten each bolt with a wrench, equalizing the load on each bolt as well as possible. Tighten until there is evidence of metal to metal contact all around between the flange, gasket retainer, and bearing plate.
- 8.2.16 For Horizontal tendons and Dome tendons, the grease cap shall be placed so that the bushing (inlet, outlet) is oriented in its highest altitude or toward the top of the containment.
- 8.2.17 After aligning the cap and placing over the anchorage install the four tendon end cap holding down clamps with bolts and washers to the bearing plate and hand tighten them.
- 8.2.18 Reckeck that the gasket has not slipped or become crimped and that the tendon end cap and hold down bolts are aligned properly.
- 8.2.19 Tighten each bolt, equalizing the load on each as much as possible, to evenly compress the gasket by approximately 1/8".
- 8.2.20 Apply a new wrapping of TMI approved sealant to the grease cap filler bushing prior to final insertion and tightening.
- 8.2.21 Record on Data Sheet SQ 12.0, the completeness of the installation and that the bolts were tightened in incremental passes.

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- 8.2.22 The replacement is now complete and re-greasing can be performed observing the requirements of PSC Procedure SQ 12.1.
- 8.3 Installation of upper Vertical caps
- 8.3.1 Only minor cleaning and brushing should be necessary to prepare the bearing plate and grease cap for remounting to the bearing plate or anchorage.
- 8.3.2 Prepare bearing plate surface by cleaning with rags and solvent. If detrimental foreign matter such as mill scale, rust, and dirt is detected on the gasket bearing surface of the plate, and power tool cleaning is required, then:
- 8.3.2.1 Make suitable provisions to protect the tendon wires and anchor head threads from accidental rubbing, cutting, or scratching by coming into contact with the power tool's rotating wire brushes and/or abrasive disks. Sheet metal shrouds around the tendon and end anchorage may be necessary.
- 8.3.2.2 Take precautions to keep dirt and other foreign material out of the tendon; and from the inside of the trumpet and conduit.
- 8.3.2.3 Power tools should remove loose mill scale, loose rust, loose or flaking paint, etc. Surfaces must be clean and smooth but not necessarily burnished after using power tools.
- 8.3.2.4 Remove sharp edges, and smooth down remaining mill scale to a "featheredge".
- 8.3.3 Fill scratches, nicks, and other sharp depressions in the gasket bearing surface with nonmetallic epoxy, such as "Belzona" epoxy if approved by TMI Engineering. Use of epoxy shall be according to manufacture's application instructions.
- 8.3.3.1 Smooth out epoxy to prevent grease leakage under the gasket.
- 8.3.4 Remove all dust and loose mater from the vicinity of the tendon and entrance to the trumplet.
- 8.3.5 Clean any foreign material from the threaded bearing plate grease cap mounting holes.
- 8.3.6 Smear, swab or brush a coating of grease over all the exposed portions of the anchor head, bearing plate, shims, buttonheads and wires, if not previously done in another operation or if needed.
- 8.3.7 Clean and dry the gasket sealing surface of the grease cap.



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- 8.3.8 Record on Data Sheet SQ 12.0 that the bearing plate, grease cap, and gasket mating surfaces and bolt holes have been properly prepared and that foreign material has been controlled so as not to enter the tendon void.
- 8.3.9 With the grease cap on end, place a new gasket on the grease cap. Pliobond or a similar industrial adhesive, as approved by TMI Engineering, may be used to hold the gasket in place.
- 8.3.10 New gaskets shall be used in the final placement of the grease cap. Old or used gaskets may be used during temporary placement of the grease caps.
- 8.3.11 Install the four studs in to the retaining ring attached to the anchor head.
- 8.3.12 Align the grease cap over the anchorage against the bearing plate using care to avoid damaging or misaligning the gasket.
- 8.3.13 Install the four end cap hold down nuts (with gasket and washer) on the studs and hand tighten.
- 8.3.14 Recheck that the gasket has not slipped or become crimped and that the tendon cap is properly aligned.
- 8.3.15 Tighten each nut, equalizing the load on each stud as much as necessary to evenly compress the main gasket. No torqueing is required.
- 8.3.16 Record on Data Sheet SQ 12.0, the completeness of the installation and that the bolts were tightened in incremental passes.
- 8.3.17 The replacement is now complete and re-greasing can be performed observing the requirements of PSC Procedure SQ 12.1.

9.0 DOCUMENTATION

9.1 The items requiring documentation in this procedure shall be documented by the assigned field construction person of the working crew on Data Sheet SQ 12.0 attached to this procedure, as an option a Precision Surveillance Corporation QC Inspector may record the documentation.

10.0 NOTIFICATION

10.1 PSC Site Superintendent shall be notified if any problems are encountered during the replacement of grease caps.

11.0 ATTACHMENTS

11.1 Data Sheet SQ 12.0.



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Project:	TMI 40 TH YEAR TENDON SURVEILLANCE		
Tendon No	.: Tendon End:	Shop	Field
	ANCHORAGE INSPECTION CR	RITERIA	
	BEARING PLATE SURFACE PROPERLY PREPARED:	☐ YES	
	GREASE CAP SURFACE PROPERLY PREPARED:		
	GASKET MATING SURFACE PROPERLY PREPARED:		NO
	STUD/BOLT HOLES PROPERLY PREPARED:	T YES	
	FOREIGN MATERIAL EXCLUSION CONTROLLED:		
	COMMENTS		
	· · · · · · · · · · · · · · · · · · ·		
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CREW F	OREMAN SIGNOFF		Date:
QC Rev	viewed: Lev	/el:	Date:

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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **GREASE REPLACEMENT** Mulissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Approved by Title Date 31 SQ 12.1 TMI.13 ISI



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1.0 PURPOSE

1.1 This procedure will establish the requirements for the Replacement of Grease in the tendon duct after scheduled inspections and evaluation during the 40th Year In-Service-Inspections (Surveillance) of the Post-Tensioning System Tendons of Exelon's Three Mile Island Nuclear Plant - Unit 1.

2.0 SCOPE

2.1 This procedure is intended to provide the Grease Replacement requirements for the wire post-tensioning system. This procedure requires that all tendons worked on shall be full of grease at the end of the project.

3.0 **RESPONSIBILITY**

- 3.1 In the event of conflict between any TMI Procedure and an SQ, the former governs.
- 3.2 As stated in PSC Procedure QA 4.0.

4.0 QUALIFICATIONS

4.1 As stated in PSC Procedure QA 4.1.

5.0 EQUIPMENT

5.1 The gauges and test equipment necessary for the Quality Control activities will be itemized in PSC Procedure SQ 4.0.

6.0 QUALITY CONTROL

6.1 This procedure contains Quality Control Documentation (<u>QCD</u>) points. The work shall not progress past or through a <u>QCD</u> without a sign-off or verbal approval from the QC Inspector. The sign-off's and required information or evaluation data shall be documented on Data Sheet 12.1. It shall be necessary to acquire the Total Grease Loss for the tendon from the Data Sheets 6.0 of PSC Procedure SQ 6.0 for each end, if applicable.

7.0 PRECAUTIONS

7.1 During Grease Replacement, the grease may be very hot and pumped under pressure. It is therefore essential to avoid direct contact with the hot grease and to make sure all connections are secure.

CAUTION - DURING GREASING, BE AWARE THAT THE GREASE IS HOT AND MAY BE PUMPED UNDER PRESSURE.



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- 7.2 Spilled grease from hoses and voids could be a slipping safety hazard, during all operations it should be cleaned up and placed in waste drums.
- 7.3 Pumping of grease should be stopped immediately if it is suspected or known that the grease is going somewhere else besides the immediate tendon void.

8.0 **PREREQUISITES**

- 8.1 All Inspections, if required per SQ2.0, will be complete.
- 8.2 The tendon will be in a stressed condition.
- 8.3 The Grease Cap shall be ready to be installed or already have been installed.
- 8.4 <u>QCD</u> Document the type of grease (corrosion inhibitor) being used for the greasing of this tendon. The requirements for acceptable corrosion inhibitor are listed in section 9.1.2 of this procedure.
- 8.5 <u>QCD</u> Enter the tendon end designation and quantity of total grease loss from Data Sheet 6.0 for one end of the tendon, if applicable
- 8.6 <u>QCD</u> Enter the tendon end designation and the quantity of total grease loss from Data Sheet 6.0 for the other end of the tendon, if applicable.
- 8.7 <u>QCD</u> Enter the tendon end designation and any estimated grease loss that may have occurred as a result of leaks from the grease cap or gasket since the original installation or previous surveillance for the first end of the tendon.
- 8.8 <u>QCD</u> Enter the tendon end designation and any estimated grease loss that may have occurred as a result of leaks from the grease cap or gasket since the original installation or previous surveillance for the second end of the tendon.
- 8.9 **QCD** Calculate the total tendon grease loss by adding 8.5 + 8.6 + 8.7 + 8.8 and document the total tendon grease loss on Data Sheet 12.1.

9.0 CONTROLS FOR REFILLING THE TENDON VOID

9.1 <u>All Tendons</u>

- 9.1.1 The replacement of grease shall be performed prior to demobilization of the tendon surveillance equipment and personnel.
- 9.1.2 Tendons shall be filled with Tendon Corrosion Inhibitor (Certified) issued by the Utility Quality Program OR drained grease removed from the system ONLY after acceptable sample testing per Section SQ 7.0 OR upon written approval by Exelon.
- 9.1.3 Grease Temperature required at grease cap inlet: *180°F min., 2*50°*F* max.



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- 3/13 If 10 on 0
- 9.1.4 Required grease to be drain for Thermal Expansion upon successful pump through: *1 gallon*. This will curtail any excess pressure build up which may lead to gasket failure. (Vertical tendons bottom end only)
- 9.1.5 Required hold time at full pressure: *30 minutes* if pump through not achieved.
- 9.1.6 Pumping shall be stopped immediately if it is suspected or known that the grease is going somewhere else besides the immediate tendon void.
- 9.2 <u>Hoop and DomeTendons</u>
- 9.2.1 Maximum pressure at grease cap inlet when pressure pumping: *100 psig*
- 9.2.2 If less than 5 gallons of grease has been lost from the tendon void (duct) at each end of the tendon, each end shall be poured or hand pumped with hot grease until full.
- 9.2.3 If more than 5 gallons of grease has been lost from the tendon void (duct) at either end of the tendon, the tendon shall be pressure pumped with hot grease from one end until it exits the Opposite End. Pumping may be stopped after 30 minutes if nothing exits at the Top end.
- 9.2.3.1 Where there is no grease exiting from the opposite end of a hoop or dome tendon, it shall be necessary to hand pump hot grease into the opposite end grease cap until full.
- 9.3 <u>Vertical Tendons</u>
- 9.3.1 Maximum pressure at grease cap inlet when pressure pumping: *110 psig* (may be pulsated up to *150 psig* to clear any blockage)
- 9.3.2 If more than 10 gallons of grease has been lost from the tendon void (duct) at the lower end, the tendon shall be pressure pumped with hot grease from the bottom end until it exits the Top End. Pumping may be stopped after 30 minutes if nothing exits at the Top end.
- 9.3.2.1 Where there is no grease exiting from the top end of a vertical tendon, it shall be necessary to pour or hand pump hot grease into the top end grease cap until full.

10.0 MEASUREMENT OF GREASE REPLACEMENT

10.1 The grease may be in a large storage container or in 55-gallon drums. The large storage container shall have an automatic thermostat control for temperature, while drum heaters shall be used to heat the grease in drums.



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- 10.2 The grease shall be monitored for quantity by measuring the quantity of grease remaining in the drum or by measuring the drum to determine the quantity that has been pumped out.
- 10.3 To provide a grease volume number in gallons based on a standard 55 gallon drum, divide the 55 gallons by the usable height of the drum (31 inches). This provides a figure of 1.77 gallons per inch of drum height. Note that a typical 55 gallon drum is 34 inches high, but based on actual observation, grease shrinkage and the depressed lid take up 3 inches of height.
- 10.4 Take a measurement of the height of the grease in the drum with a clean measuring device before installing any grease. It will be acceptable to take the measurement from the top of the grease in the drum to the top edge of the drum. Document the grease height dimension to the nearest .05 of an inch.
- 10.5 Take a measurement of the height of the grease in the drum after installing the grease. Document the final grease height dimension to the nearest 0.05 of an inch.
- 10.6 Calculate and document the Total Quantity of grease replaced into the cap to the nearest tenth (0.1) of a gallon.
- 10.6.1 *EXAMPLE*: If the initial grease height was 25.5" and the final grease height was 6.25", this is a 19.25" reduction multiplied by 1.77 gallons per inch which equals 34.1 gallons pumped in.
- 10.7 The same methodology may be used for containers of different size or configuration.

11.0 MEASUREMENT OF GREASE WASTE

- 11.1 When it becomes necessary to determine the volume of grease that was pumped into the tendon void, it will be necessary to subtract the waste grease outflow, spillage, grease remaining in the pump-in hose, grease remaining in the waste line hose from the grease volume that was pumped from the drum into that tendon.
- 11.2 The 1 gallon of grease drained from the inlet end after a successful pump through shall be considered waste grease if it is not drained back into the original drum.
- 11.3 If the waste grease is pumped into a 55 gallon drum, then each inch of drum height will equal to 1.77 gallons.
- 11.4 Smaller containers should be evaluated for size to determine the capacity. These types of containers would only require a simple estimate for the waste grease contained therein.
- 11.5 Before pumping any waste grease into a container, always verify the quantity within that container prior to pumping.

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12.0 PRESSURE PUMPING

- 12.1 The grease replacements described in this procedure are for both ends of a tendon. The terms tendon void, tendon conduit, and tendon duct are synonymous.
- 12.2 If more than 5 gallons of grease has been lost from the tendon void (duct) at either end of a hoop or dome tendon, the tendon shall be pressure pumped with hot grease from one end until it exits the opposite end. Pumping may be stopped after 30 minutes if nothing exits.
- 12.3 If more than 10 gallons of grease has been lost from the tendon void (duct) at the lower end of a vertical tendon, the tendon shall be pressure pumped with hot grease from the bottom end until it exits the top end. Pumping may be stopped after 30 minutes if nothing exits.
- 12.4 Remove the grease cap plug; attach the "Y-Device" to the end of the grease cap to be pumped. Connect the Y-Device, if necessary, and waste outflow hose to the opposite end of the tendon. Be sure to have a suitable quantity of waste containers on hand to collect the waste.
- 12.5 Be sure that adequate communication is provided at each end of the tendon so that the crew at each end of the tendon will know what actions are taking place.
- 12.6 <u>QCD</u> Document the ambient temperature near the tendon, as well as the Thermometer Identification and Recalibration Date.
- 12.7 <u>QCD</u> Document the inlet temperature of the grease as well as the thermometer identification and its recalibration date.
- 12.8 Prior to attaching the inlet greasing hose to the Y-Device, circulate hot grease through the system to ensure the grease is at sufficient temperature prior to pumping into the tendon void. Pressure pump and greasing hose should be fully primed prior to connecting to the Y-Device.
- 12.9 **<u>QCD</u>** Document the initial grease height dimension to the nearest .05 of an inch. Refer to Section 10.0 for further explanation of grease measurement.
- 12.10 Commence pressure pumping grease into the tendon in accordance with the controls stated in Section 9.0.
- 12.11 If the grease exits the opposite end of a dome tendon, pumping shall continue until a minimum of 1 gallon of clean grease has exited from the opposite end with a temperature of 140°F. The opposite end Y-Device shall then be closed and pressure pumping from the inlet end will continue until maximum pressure is achieved. Upon achievement of maximum pressure, stop pumping and drain 1 gallon of grease from the inlet end.



- 12.12 When pump through is not achieved on the initial attempt, the following actions should take place in order to maximize the effort of filling the tendon void.
- 12.12.1 Build pressure to the maximum pressure at the grease cap inlet in accordance with Section 9.3.1.
- 12.12.2 Hold pressure for a minimum of 30 minutes. This may require additional pumping in order to remain at the desired maximum pressure.
- 12.12.3 If pump through is achieved, continue with step 12.11.
- 12.12.4 If pump through is still not successful pumping from this end shall be complete. It shall be necessary to hand pump the opposite end of the tendon by following the steps in Section 13.0
- 12.13 Release any pressure from the inlet end before disconnecting any of the hoses from the Y-Device. Ensure all shut-off valves are closed before disconnecting any grease connections at either end.
- 12.14 <u>QCD</u> Once the tendon end has been completed, document the final grease height dimension to the nearest .05 of an inch. Refer to Section 10.0 for further explanation of grease measurement.
- 12.15 Remove grease hoses and Y-Devices from both ends and replace the grease cap plugs on both ends of the tendon.
- 12.16 <u>QCD</u> Calculate and document the quantity of hot grease pressure pumped into this tendon end in accordance with Section 10.6. Also, document the tendon end identification, either shop/field and/or nearest buttress number to the tendon end being pumped.
- 12.17 <u>QCD</u> Document whether successful pump through was achieved via exiting grease at the other end of the tendon. If exit was not achieved, document the pressure and time held in order to attempt pump through.
- 12.18 <u>**QCD**</u> Document the quantities of waste grease if any, including any exiting outflow grease. Refer to Section 11.0 of this procedure for explanation on calculating waste grease.
- 12.19 <u>QCD</u> Calculate and document the total amount of grease replaced through the current inlet end of the tendon by subtracting the amount of any waste grease from the quantity of hot grease pressure pumped into this tendon end.
- 12.20 Continue to Section 14.0 for final calculation of quantity of grease replaced if pump through was successful.

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13.0 POURING AND HAND PUMPING

- 13.1 The grease replacements described in this procedure are for one end of a tendon. however both ends of the tendon will be documented on the same data sheet. The terms tendon void, tendon conduit, and tendon duct are synonymous.
- 13.2 If less than 5 gallons of grease has been lost from the tendon void (duct) at each end of a hoop or dome tendon, each end shall be poured or hand pumped with hot grease until full.
- 13.3 If less than 10 gallons of grease has been lost from the tendon void (duct) at the lower end, hot grease shall be poured or hand pumped into the top end until full.
- 13.4 If pressure pumping is unsuccessful from the end of any tendon hot grease shall be poured or hand pumped into the opposite end until full.
- 13.5 Remove the grease cap plug; attach the "Y-Device" to the end of the grease cap to be pumped or poured. It shall be acceptable to hand pump or pour grease directly into the grease cap without the use of a "Y-Device" if the grease cap configuration will allow this.
- 13.6 **QCD** – Document the ambient temperature near the tendon, as well as the Thermometer Identification and Recalibration Date.
- 13.7 **QCD** – Document the inlet temperature of the grease as well as the thermometer identification and its recalibration date.
- 13.8 Prior to attaching the inlet greasing hose to the Y-Device or grease cap, circulate hot grease through the system to ensure the grease is at sufficient temperature prior to pumping into the tendon void. Hand pump and greasing hose should be fully primed prior to connecting to the Y-Device. This step is not necessary if grease is being poured into the grease cap.
- 13.9 **QCD** – Document the initial grease height dimension to the nearest .05 of an inch. Refer to Section 10.0 for further explanation of grease measurement.
- 13.10 If grease is being hand pumped, commence pumping grease into the tendon in accordance with the controls stated in Section 9.0.
- 13.11 If grease is being poured, transfer grease into secondary (smaller) container and pour into the Y-Device or grease cap until full. Grease replacement must be in accordance with controls outlined in Section 9.0.
- 13.12 **QCD** – Once the tendon end has been completed, document the final grease height dimension to the nearest .05 of an inch. Refer to Section 10.0 for further explanation of grease measurement.



- 13.13 Remove grease hoses and Y-Devices as necessary from both ends and replace the grease cap plugs on both ends of the tendon. Verify no grease is leaking.
- 13.14 <u>**QCD**</u> Calculate and document the quantity of hot grease hand pumped or poured into this tendon end in accordance with Section 10.6. Also, document the tendon end identification, either shop/field and/or nearest buttress number to the tendon end being pumped.
- 13.15 <u>QCD</u> Document whether grease replacement was accomplished by hand pumping or pouring.
- 13.16 **<u>QCD</u>** Document the quantities of waste grease if any. Refer to Section 11.0 of this procedure for explanation on calculating waste grease.
- 13.17 <u>QCD</u> Calculate and document the total amount of grease replaced through the current inlet end of the tendon by subtracting the amount of any waste grease from the quantity of hot grease hand pumped or poured into this tendon end.
- 13.18 Repeat the steps in Section 13.0 for the other end of a hoop or dome tendon if applicable.
- 13.19 Continue to Section 14.0 for final calculation of quantity of grease replaced when grease replacement is complete.

14.0 CALCULATION OF GREASE REPLACEMENT

- 14.1 <u>QCD</u> Calculate the total tendon grease replaced by adding the quantities of grease replaced by pressure pumping each end (combination of 12.19 and 13.17 as applicable).
- 14.2 <u>QCD</u> Obtain the calculated net volume of the tendon void from PSC Procedure SQ12.2 and post it on Data Sheet 12.1
- 14.3 <u>QCD</u> Compare the total tendon grease replaced (14.1) to the total tendon grease loss (8.9). Calculate the percent difference by the following formula:

[TOTAL TENDON QUANTITY REPLACED (14.1)]-[TOTAL TENDON GREASE LOSS (8.9)] NET VOLUME TENDON VOID (SQ 12.2)

- 14.4 <u>QCD</u> Verify that no grease is leaking. If there is some leakage, the deficiency shall be corrected and cleanup performed. Document the acceptance of leak tightness.
- 14.5 <u>**QCD**</u> Document the acceptability of the refilling. An acceptable refilling is one in which the percent difference from Section 14.3 of this procedure does not exceed 10% and there are no leaks.



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14.6 <u>QCD</u> – Document any pertinent comments, unusual occurrences or references that could assist in evaluating the refill or for future surveillances.

15.0 NOTIFICATION

15.1 If the absolute difference between the amount of grease removed from the tendon and the amount of grease replaced exceeds 10% of the net duct volume, it shall be necessary to notify TMI Engineering with a nonconformance report within 24 hours.

16.0 DOCUMENTATION

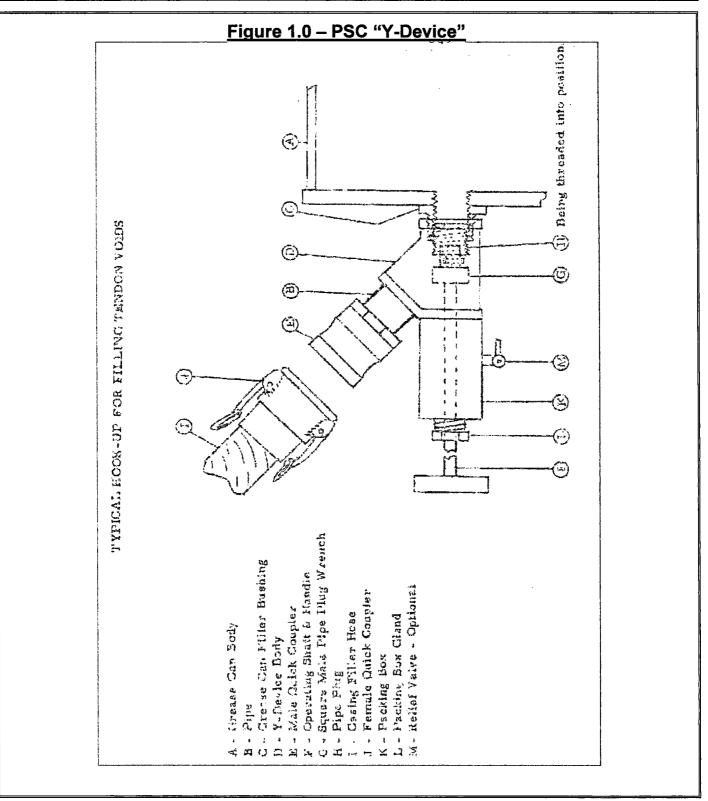
- 16.1 The items requiring documentation shall be documented on Data Sheet 12.1a or 12.1b as necessary. Data Sheet 12.1a shall be used when a tendon is pressure pumped and 12.1b shall be used when a tendon is hand pumped from both ends.
- 16.2 Some information shall be posted from Data Sheet 6.0 of PSC Procedure SQ 6.0 onto Data Sheet 12.1a or 12.1b as applicable.
- 16.3 The Data Sheets reference the applicable Section or Step number of the procedure for each <u>QCD</u> point.

17.0 ATTACHMENTS

- 17.1 Figure 1.0 PSC "Y" Device
- 17.2 Data Sheet 12.1a Pressure Pumping
- 17.3 Data Sheet 12.1b Hand Pumping



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N1091 PSC PROCEDURE SQ 12.1 GREASE REPLACEMENT Data Sheet 12.1a – Pressure Pumping 09/03/13 Page 1 of 1 Revision 0

Project: TMI 40 th YEAR TENDON SURVEILLANCE	Tendon No.:	
GREASE REPLAC	EMENT	QC SIGNOFFS
(8.4) Grease Used INEW OLD - TEST DATE: 8.0 PREREQUISITES	ACCEPTABLE APPROVAL LETTER DATED:	
(8.5) Total Grease Loss from Data Sheet 6.0 for	tendon end:gal	·
(8.6) Total Grease Loss from Data Sheet 6.0 for	_ tendon end: gal	
(8.7) Estimated grease losses from leaks for	_ tendon end: gal	
(8.8) Estimated grease losses from leaks for	tendon end: gal	
(8.9) TOTAL Tendon Grease Loss:	gal	
12.0 INITIAL PRESSURE PUMPING		
(12.6) Ambient Temp.: <u>°F</u> Thermometer ID:	Recal Date:	
(12.7) Grease Temp.: <u>°F</u> Thermometer ID:	Recal Date:	
· · · · · · · · · · · · · · · · · · ·	4) Final Grease Height (b) in.	
(12.16) Total amount of Grease Pumped: gal.	(a – b) x 1.77 into the end	
(12.18) Quantity of Waste Grease: gal.	(12.17) Was Exit Achieved? Yes No	
(12.19) Total Grease <u>Replaced</u> this end:gal.	If no, Pressure Held forpsimin	
13.0 HAND PUMPING - SECOND END (if necessary)		
(13.6) Ambient Temp.: <u>°F</u> Thermometer ID:	Recal Date:	
(13.7) Grease Temp.: <u>°F</u> Thermometer ID:	Recal Date:	
	2) <u>Final</u> Grease Height (b) in.	
· · · ·	(a - b) x 1.77 into the end	
(13.16) Quantity of Waste Grease: gal.	-	
(13.17) Total Grease <u>Replaced</u> this end: gal.		
14.0 CALCULATION OF PRESSURE PUMPING (14.1) Total Tendon Grease Replaced: gal.	(12.19 + 13.17)	
(14.2) Net Tendon Duct Grease Volume: gal.	- ' '	
Total Tendon Replaced (14.1) - Tota	– I Tendon Loss (8.9)	
(14.3) Percent Difference: Net Tendon Duct Grease Vo	lume (14.2) × 100 =% Difference	
(14.4) Grease Leaks: 🗌 Yes 📋 No		
	er than 10%)	
(14.6) Comments:	Notified NCR No.:	
QC Reviewed:	Level: Date:	

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N1091 PSC PROCEDURE SQ 12.1 GREASE REPLACEMENT Data Sheet 12.1b – Hand Pumping 09/03/13 Page 1 of 1 Revision 0

Project: TMI 40 th YEAR TENDON SURVEILLANCE	Tendon No.:
GREASE REPLACE	EMENT QC SIGNOFFS
(8.4) Grease Used INEW OLD - TEST DATE: 8.0 PREREQUISITES	ACCEPTABLE APPROVAL LETTER
(8.5) Total Grease Loss from Data Sheet 6.0 for	tendon end: gal.
(8.6) Total Grease Loss from Data Sheet 6.0 for	tendon end: gal.
(8.7) Estimated grease losses from leaks for	tendon end: gal.
(8.8) Estimated grease losses from leaks for	tendon end: gal.
(8.9) TOTAL Tendon Grease Loss:	gal.
13.0 POURING AND HAND PUMPING – FIRST END	
(13.6) Ambient Temp.: <u>°F</u> Thermometer ID:	Recal Date:
(13.7) Grease Temp.:°F Thermometer ID:	Recal Date:
(13.9) <u>Initial</u> Grease Height (a) in. (13.12) <u>Final</u> Grease Height (b) in.
(13.14) Total amount of Grease added: gal.	(a – b) x 1.77 into the end
(13.16) Quantity of Waste Grease: gal.	(13.15) Poured Hand Pumped
· (13.17) Total Grease <u>Replaced</u> this end: gal.	
13.0 HAND PUMPING - SECOND END	
(13.6) Ambient Temp.: °F_ Thermometer ID:	Recal Date:
(13.7) Grease Temp.: <u>°F</u> Thermometer ID:	Recal Date:
(13.9) <u>Initial</u> Grease Height (a) in. (13.12	?) <u>Final</u> Grease Height (b) in
(13.14) Total amount of Grease added: gal.	(a – b) x 1.77 into the end
(13.16) Quantity of Waste Grease: gal.	(13.15) Poured Hand Pumped
(13.17) Total Grease <u>Replaced</u> this end: gal.	
14.0 CALCULATION OF PRESSURE PUMPING	
(14.1) Total <u>Tendon</u> Grease Replaced: gal.	(13.17 + 13.17)
(14.2) Net Tendon Duct Grease Volume: gal.	Refer to SQ 12.2 – GREASE VOLUMES, for the Tendon Net Duct Volume
(14.3) Percent Difference: Total Tendon Replaced (14.1) - Total Net Tendon Duct Grease Volu	
(14.4) Grease Leaks: 🔲 Yes 🗌 No	
(14.5) Refill Acceptable: Yes (less than 10%) No (greated	
If No – Customer 1 (14.6) Comments:	Notified NCR No.:
QC Reviewed:L	Date:
·	



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **GREASE VOLUMES** Mulissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Approved by Title Date 32 SQ 12.2.TMI.13 ISI

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1.0 PURPOSE

1.1 This procedure will establish the Net Tendon Duct Grease Volumes to be observed during the refilling of the Post-Tensioning System Tendons with Corrosion Protection Material (Grease) during the 40th Year In-Service-Inspection (surveillance) of the Post-Tensioning System at Exelon's Three Mile Island - Unit 1 as provided by TMI Engineering.

2.0 SCOPE

2.1 This procedure shall apply to PSC Procedure SQ 12.1.



2.2

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TENDON	NET DUCT VOLUME (GAL.)	10% NET DUCT VOL. (GAL.)	TENDON	NET DUCT VOLUME (GAL.)	10% NET DUCT VOL. (GAL.)
D-142	86.9	8.69	H24-22	110.1	11.01
D-143 .	85.4	8.54	H24-23	110.1	11.01
D-144	84.1	8.41	H24-24	110.4	11.04
D-224	97.5	9.75	H35-01	110.3	11.03
D-225	97.5	9.75	H35-02	110.1	11.01
D-226	97.6	9.76	H35-05	110.0	11.00
D-236	93.6	9.36	H62-25	110.3	11.03
D-237	92.8	9.28	H62-26	110.1	11.01
D-238	92.1	9.21	H62-27	110.1	11.01
D-302	78.4	7.84			<u>.</u>
D-303	80.3	8.03	V-30	119.8	11.98
D-304	82.2	8.22	V-32	120.4	12.04
			V-33	120.2	12.02
H13-02	109.7	10.97	V-84	120.0	12.00
H13-03	109.7	10.97	V-107	119.6	11.96
H13-04	110.4	11.04	V-108	120.3	12.03
H13-10	110.7	11.07	V-109	119.9	11.99
H13-11	110.6	11.06	V-159	119.9	11.99
H13-12	111.3	11.13	V-160	119.8	11.98
H24-15	110.9	11.09	V-161	120.0	12.00
= SUR	VEILLANCE	TENDON	= ADJ	ACENT TEN	DON

Table 7-1: TMI Unit 1 – Grease Void Volumes for All Surveillance Tendons



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2.3 Table 7-2: TMI Unit 1 - Grease Void Volumes for All Augmented Scope Tendons -ENDON TENDON ET DUC DNC. H46-33 109.7 10.97 V-114 119.0 11.90 H46-34 109.8 10.98 V-115 119.0 11.90 H46-36 109.6 10.96 V-116 120.3 12.03 H51-39 109.6 10.96 V-135 121.7 12.17 H51-40 109.1 10.91 V-136 121.6 12.16 H51-41 108.8 10.88 V-137 122.8 12.28 = SURVEILLANCE TENDON = ADJACENT TENDON

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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **PROGRAM PURPOSE** Mulissa Hara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussore Q.A. MANAGER 09/03/13 Approved by Title Date PRESIDENT 09/03/13 Approved by Title Date

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N1091 PSC PROCEDURE QA 1.0 **PROGRAM PURPOSE** 09/03/13 Page 2 of 2 Revision 0

1.0 PURPOSE

1.1 This section of the Surveillance I.S.I Manual shall outline the Quality Assurance/Quality Control activities necessary to insure that the In-Service Inspection operations are performed in accordance with approved procedures and provide the required quality level, consistent with the project specifications, industry standards, regulatory code requirements and the Precision Surveillance Corporation Quality Assurance Program.



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UNIT 1 (40	EXELON E MILE ISLAND TH YEAR) PHYSICAL DING TENDON SURVEILLAN	CE
IN-SER'	VEILLANCE CORPORATION VICE INSPECTION ONTROL PROCEDURE	
PRC	OGRAM SCOPE	
Melisa Lara	Q.C. INSPECTOR	09/03/13
Prepared by	Title	Date
Gerald F. Bussone	Q.A. MANAGER	` 09/03/13
Approved by	Title	Date
P. c. last	PRESIDENT	09/03/13
Approved by	Title	Date



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1.0 SCOPE

1.1 The Quality Assurance Procedures within this Section of the Surveillance Program I.S.I. Manual are intended to be supplemental to the Precision Surveillance Corporation (PSC) Quality Assurance Manual. They are not intended to replace any Criteria of the Quality Assurance Manual. The Quality Assurance Manual remains as the highest category of document within the Quality Assurance Program hierarchy of documents.

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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **QUALITY ORGANIZATION** Melissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date P. c. La PRESIDENT 09/03/13 Approved by Title Date 35 QA 3.0 TMI.13 ISI

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N1091 PSC PROCEDURE QA 3.0 QUALITY ORGANIZATION 09/03/13 Page 2 of 2 Revision 0

1.0 ORGANIZATION

- 1.1 PSC Field Quality Control Inspectors operate under the immediate direction of the Lead Field Quality Control Inspector, who in turn reports to the PSC Manager, Quality Assurance.
- 1.2 The Field Quality Control Inspectors shall have full authority and responsibility in all matters pertaining to or affecting the quality control function for the Surveillance of the Post-Tensioning System. These Inspectors shall have the authority to accept, reject, or recommend changes to the field operations or performance.
- 1.3 The Field Quality Control Inspectors, and the Quality Assurance personnel shall have the authority to issue a "Stop Work Order" for any activity, material, or procedure not in conformance with the project specifications, the Quality Assurance Manual or the Surveillance I.S.I. Manual. The stop work action shall be coordinated through the PSC Manager of Quality Assurance.
- 1.4 The Quality Assurance Procedures section of this manual shall serve to further outline the duties and responsibilities of those personnel engaged in performing the quality control functions for the Surveillance of the Post-Tensioning System.
- 1.5 All personnel engaged in those activities that affect the quality function for the Surveillance operations, shall be qualified by experience or training, prior to the initial performance of their assignments.
- 1.6 Documentation of qualification and/or training shall be maintained in the quality files on site for those personnel engaged in quality activities.



N1091 PSC PROCEDURE QA 4.0 RESPONSIBILITY 09/03/13 Page 1 of 2 Revision 0

EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE QUALITY CONTROL RESPONSIBILITY Mulissa Jara Prepared by Q.C.INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Approved by Title Date 36 QA 4.0 TMI.13 ISI



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1.0 QUALITY CONTROL RESPONSIBILITY

- 1.1 The responsibility for the Quality Assurance and Quality Control functions for this project shall be incumbent on those organizations performing that portion of the work described within the various sections of this manual, or as otherwise agreed to in the contract documents.
- 1.2 Portions of the work not performed by PSC, but where PSC supplies only the equipment or material, shall be subject to the quality requirements specified within the applicable PSC Surveillance I.S.I. Manual, where that Quality Manual has been developed to comply with the project specifications or contract documents.
- 1.2.1 The development of the Quality Assurance and Quality Control procedures for the Surveillance operations shall be the responsibility of those organizations performing that portion of the work, unless otherwise agreed to in the contract documents.
- 1.3 PSC Field Quality Control Personnel shall provide the Quality Control actions for that portion of the work, where PSC or its subcontractors are performing the work or as agreed to in the project specifications or contract documents. All subcontractors performing work as an agent of PSC shall be subject to the Quality requirements of the project specifications and the applicable PSC Quality Program.

1.4 PSC and its subcontractors and vendors, shall maintain open access for Inspection, Survey and Audit by Exelon for all portions of the work being performed for the project.



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **PERSONNEL QUALIFICATIONS** Muissa Lara Q.C. INSPECTOR 09/03/13 Prepared by Title Date Gerald F. Bussore Approved by Pour C. Link Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Title Approved by Date 37 QA 4.1 TMI.13 ISI



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1.0 QUALIFICATIONS

- 1.1 QUALITY CONTROL INSPECTORS
- 1.2 All Quality Control Inspectors performing Inspections and Tests shall be qualified to minimum of Level II capability in accordance with the requirements of ANSI N45.2.6-1978. Inspectors performing General or Detailed Visual Examinations are to be qualified as a Level II examiner as defined in PSC's written certification practice approved by Exelon and each examiner shall be approved by the Exelon Responsible Engineer.
- 1.3 All Lead Field Quality Control Inspectors shall be qualified to a minimum of Level II capability in accordance with the requirements of ANSI N45.2.6-1978.
- 1.3.1 All Field Quality Control Inspectors performing reviews of Quality Control Documentation for the various procedures in the PSC Surveillance I.S.I. Manual shall be qualified to a minimum of Level II in accordance with the requirements of ANSI N45.2.6-1978.
- 1.3.2 All Quality Control Inspectors shall be certified to specific skill Levels by a Quality Control Inspector who has been qualified as Level III in accordance with the requirements of ANSI N45.2.6-1978.

1.4 PERSONNEL

- 1.4.1 Precision Surveillance Corporation Field Construction Personnel shall be responsible for the physical activities associated with the Surveillance of Post-Tensioning System Tendons. Construction Personnel shall be fit by skill, training and/or experience to perform these activities.
- 1.5 SUPERVISION
- 1.5.1 PSC Supervisory and Field Representative Personnel shall be responsible for administering the progress of the work and directing PSC Field Construction Personnel as necessary. These Personnel shall be fit by skill, training and/or experience to perform these duties.
- 1.5.2 Construction Personnel or Construction Supervision need not be qualified to ANSI N45.2.6 as they are supervised or overseen by a qualified individual participating in the inspection, examination, or test.
- 1.6 AUDITORS
- 1.7 PSC Personnel performing audits of field operations shall be qualified as auditors in accordance with the requirements of ANSI N45.2.23-1978.



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2.0 DOCUMENTATION

2.1 Records of training and personnel skill certifications shall be documented in accordance with the requirements of the governing ANSI N45.2 or daughter specifications and shall be retained on site for those personnel so certified and/or trained.



N1091 PSC PROCEDURE QA 5.0 PERSONNEL TRAINING 09/03/13 Page 1 of 2 Revision 0

UNIT 1 (40	EXELON E MILE ISLAND O TH YEAR) PHYSICAL DING TENDON SURVEILLAN	CE
IN-SER	VEILLANCE CORPORATION VICE INSPECTION ONTROL PROCEDURE	
PERSC	ONNEL TRAINING	
Melisa Lara	Q.C. INSPECTOR	09/03/1
Mulissa Jara Prepared by	Q.C. INSPECTOR	09/03/13 Date
Prepared by Gerald F. Bussone	Title Q.A. MANAGER	Date 09/03/1
Prepared by	Title	Date
Prepared by Gerald F. Bussone Approved by	Title Q.A. MANAGER Title	Date 09/03/1 Date



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1.0 TRAINING

- 1.1 Precision Surveillance Corporation personnel on site involved in the Surveillance of the Post-Tensioning System, shall be qualified and experienced in all phases of Post-Tensioning operations.
- 1.2 All training activities shall be conducted and coordinated by qualified, experienced, PSC personnel.
- 1.3 At the start of the work and usually at the beginning of each new phase of the Post-Tensioning operations, the field crews shall be instructed to perform the work in a safe manner and in accordance with the approved surveillance procedures manual. They shall further, be trained in the use of the Post-Tensioning equipment for the operation for which they are being qualified, and for any subsequent actions during those operations that may affect the quality or integrity of the Post-Tensioning System.
- 1.4 The duration of the training period shall not be of a predetermined period of time, but shall instead be of such a length of time, that the PSC training personnel feel confident that the personnel being trained are sufficiently knowledgeable in the methods and procedures of the operation for which they are being trained. Each trainee shall be oriented by on-the-job training prior to the initial performance of any quality oriented function and each time he performs a different job assignment not previously trained or qualified for.
- 1.5 A list of the trained and qualified personnel shall be maintained on site, indicating the training received and the dates of training. Newly trained personnel shall be added to the list as the training is completed. This list shall be reviewed and controlled by PSC Field Quality Control personnel. Crew proficiency shall be verified during the progress of the work, through the mediums of inspection, surveillance or audit.
- 1.6 Procedures shall be used for training those personnel not familiar with Post-Tensioning Systems or Surveillance activities.



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE PROCUREMENT Melissa Lara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Title Approved by Date 39 QA 6.0 TMI.13 ISI

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1.0 PROCUREMENT

- 1.1 SAFETY RELATED
- 1.2 The purchase of any safety-related material or service to be used for the Post-Tensioning System or surveillance operation shall be performed by the Procurement Section of the Precision Surveillance Corporation in accordance with the requirements of the Quality Assurance Program requirements in effect at that time and the requirements stated below.
- 1.2.1 Field personnel shall initiate a procurement request by a written or verbal order to the Construction or Project Management Section.
- 1.2.2 A requisition shall be prepared and submitted to the PSC Quality Assurance Section for attachment of applicable quality documents and/or comments and returned to the Project Management Section.
- 1.2.3 The requisition shall be sent to the Procurement Section for drafting of the purchase order, pricing, vendor selection, etc.
- 1.2.4 The purchase order shall be submitted to the Quality Assurance Section for review of quality content, approved vendor selection and sign-off. Other pertinent quality documents may be attached or referenced and then the purchase order shall be returned to the Procurement Section.
- 1.2.5 The purchase order shall be submitted to the vendor and copies of the order distributed to appropriate personnel.
- 1.2.6 Changes to the original purchase order shall be provided through the use of a Supplemental Purchase Order, which shall be subject to the same review and control process as the original purchase order.
- 1.3 NON-SAFETY-RELATED
- 1.3.1 Miscellaneous non-safety-related field purchases may be initiated by the field personnel or Procurement Section within the confines of the operating procedures established by the Operating or Construction Departments, independent of this manual.





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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **FIELD CHANGE REQUEST** Melisa Lara Q.C. INSPECTOR 09/03/13 Prepared by Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date chin PRESIDENT 09/03/13 Title Approved by Date 40 QA 7.0 TMI.13 ISI

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1.0 FIELD CHANGE REQUEST

- 1.1 The Field Change Request (FCR) shall be the mechanism for requesting rapid evaluation and approval for those operations that must be changed to accommodate field conditions. The FCR shall be approved by Exelon prior to that change being put into effect.
- 1.2 Field Changes that take place prior to the approval of the FCR shall be documented by a Nonconformance Report (NCR) and subject to a "STOP WORK" order, depending on the magnitude of the change and the impact on the quality program. It shall not be necessary to generate an NCR where it has become necessary to return or move to a safe condition of the tendon or personnel.
- 1.3 Revisions to this manual shall be performed according to the Revision Control procedure found in the prologue of the Surveillance I.S.I. Manual. The following information will supplement those procedures for Field Change Request Activity.
- 1.3.1 When field operating procedures, as stated in this manual, become impractical to follow exactly for any reason, that portion, and any other affected portion of the manual shall be revised to provide the appropriate procedures. Where possible, revisions shall be made prior to performing the work.
- 1.3.2 When revisions become necessary, they shall be formally drafted by the PSC Quality Assurance Section and submitted to Exelon for formal approval. Where applicable, the responsible PSC Field Quality Control Personnel shall prepare a Field Change Request document to expedite approval from Exelon's Field Quality Organization, Maintenance Engineer or such other authority as designated by Exelon, in order to continue operations without extraordinary delays. The change document may then be transmitted to Exelon for formal approval or to issue a change order notice type of document.
- 1.3.3 Approval of the Field Change Request or emergency revision shall be obtained from the appropriate Site Quality Assurance Authority representing Exelon, before starting any Field Changes or Revisions.
- 1.3.4 Copies of the Field Change Request shall be submitted to the PSC Quality Assurance Section for review and where necessary for development of formal procedures to be included in the Surveillance I.S.I. Manual.
- 1.3.5 The approval of the FCR shall be considered as the acceptance for the Revised Procedures unless gross changes occur during the Revision drafting that affect other portions of the Surveillance I.S.I. Manual.



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- 1.3.5.1 If gross changes occur, the Surveillance I.S.I. Manual affected procedures shall be submitted for formal review and approval. Otherwise, the FCR Revision shall be considered as approved and submitted on a controlled basis for inclusion in the Surveillance I.S.I. Manual.
- 1.3.6 As the PSC Quality Assurance Section and the Engineering Department are responsible for drafting Revisions, whether a result of the FCR process or Specification Changes, it shall not be necessary for either function to provide a formal review and signoff. It shall be necessary for the Originator or PSC Field Quality Control personnel to call the PSC Home Office to acquire agreement and acceptance of the FCR before submitting it to Exelon. This way Quality Assurance and Engineering can evaluate the impact of the FCR on Quality Control, Engineering features and other subsequent Surveillance activities.
- 1.3.6.1 The Originator or PSC Quality Control personnel shall document the review and acceptance of the PSC Home Office personnel by printing the name of the person accepting that FCR and the date of acceptance at the bottom of the Recommended Change area on the FCR form.
- 1.3.7 The original FCR shall be maintained with the Field Quality Control records.
- 1.3.7.1 The remaining distribution shall be completed, using the Distribution Listing shown at the bottom of the FCR form once the FCR is formally approved by PSC and Exelon.
- 1.3.7.2 The FCR shall be entered into the FCR Index Log for
- 1.3.7.2.1 FCR Number
- 1.3.7.2.2 Brief Description
- 1.3.7.2.3 Date Written
- 1.3.7.2.4 Date Approved
- 1.3.7.2.5 Date of Revision (to Surveillance I.S.I. Manual, if applicable)
- 1.4 DOCUMENTATION
- 1.4.1 Included with this procedure are the various forms and control sheets described in this procedure.
- 2.0 ATTACHMENTS
- 2.1 Field Change Request Form
- 2.2 Field Change Request Index Log

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N1091 PSC PROCEDURE QA 8.0 DOCUMENT CONTROL 09/03/13 Page 1 of 2 **Revision** 0

EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **DOCUMENT CONTROL** Melissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date

Gerald F. Bussore Approved by

Approved by

Q.A. MANAGER Title

PRESIDENT

Title

09/03/13 Date

09/03/13

Date

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N1091 PSC PROCEDURE QA 8.0 DOCUMENT CONTROL 09/03/13 Page 2 of 2 Revision 0

1.0 DOCUMENT CONTROL

- 1.1 The responsibility for control and retention of all documentation and records, related to the quality control functions for the project within the limitations of the contract documents shall be incumbent on those organizations performing that portion of the work and as further stated in PSC Procedure QA 3.0.
- 1.2 All documentation, which includes inspections, tests, certifications, drawings, purchase orders, specifications, procedures, correspondence and audits, etc. shall be prepared in accordance with the procedures as described in the applicable job related manuals and procedures.
- 1.3 All inspection records shall be reviewed, initialed or signed and dated by the personnel responsible for the quality control functions.
- 1.4 All quality related documents pertaining to the project shall be retained in the field office file, jobsite vault, or both and maintained in such a manner so as to permit retrieval and prevent loss.
- 1.5 Document distribution or retention shall be in accordance with the requirements of the project specifications, or as agreed to in the contract documents.
- 1.5.1 All documents such as Data Sheets, Nonconformances, verification records, calibration records, certified mill test reports, engineering analyses, etc. generated during the course of the In-Service Inspection, shall be included in the Final Report or appended to that Final Report.
- 1.6 Copies of Non-Conformance Reports shall be distributed in accordance with the project specifications or as noted on the Non-Conformance/Corrective Action form; refer to PSC Procedure QA 9.0.
- 1.7 All records shall be sent to the responsible Quality Control Section for further distribution in accordance with the project specifications, or as agreed to in the contract documents, or the PSC Quality Assurance Manual.



N1091 PSC PROCEDURE QA 8.1 **REVISION CONTROL** 09/03/13 Page 1 of 5 Revision 0

EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **REVISION CONTROL** Melissa Lara Q.C. INSPECTOR 09/03/13 Prepared by Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Approved by Title Date 42 QA 8.1 TMI.13 ISI



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1.0 GENERAL

1.1 The statements within this Manual are representative of the Precision Surveillance Corporation quality program activities in effect at the time of issue. The construction phase of the project and other delays have a direct influence on the amount of time that will transpire between the actual startup of fabrication and termination of the construction life of the contract. It may therefore become necessary to review and upgrade or revise the various quality procedures or manuals, as a means of accommodating changes in the specifications, codes, operating procedures, material procurement, or as a means of transmitting intent, information or clarification. Correction of misspelled words or typographical errors that do not affect intent, shall not be considered as revisions.

2.0 TRANSMITTAL

2.1 Submittal of revisions to Exelon shall be in conformance with PSC Procedure QA 6.0, Document Control, of the Quality Assurance Manual.

3.0 **REVISION CONTROL**

- 3.1 If a revision is submitted where a Surveillance I.S.I. Manual has been issued, only those procedures being revised shall be affected for approval status. The remainder of the Surveillance I.S.I. Manual shall still remain approved. The original or previous revision of the affected procedure shall remain in effect, unless unworkable, until the revised procedure has been approved.
- 3.2 When a revision is submitted, the entire manual shall then become "Revision One" for example. Included in the revision package are all those documents required to bring the original version of that manual to "Revision One" status.
- 3.3 A Revision Control Sheet shall show all the documents being submitted, with the correct revision status of each page. The Revision Control Sheet provides a chronological history of development for the manual while the Index Status Sheet indicates all the original documents contained within the original submittal of the manual.
- 3.4 The Index Status Sheet shall not be revised to any extent greater than to show a date and revision number in the Revision Status column on the Index Status Sheet.
- 3.5 It is unlikely that any document within any Surveillance I.S.I. Manual shall be of an unrevised status or of the same revision status as the Manual itself. Therefore, the document and manual revision numbers will not be the same. The Index Status Sheet will establish the revision status of each Manual or document issued.
- 3.6 When a revision is made to a procedure, the entire procedure will revert to that revision number, even if there are no editorial or format changes to that page.



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- 3.6.1 Revisions to a Section/Paragraph of a procedure will be identified with a triangle appearing at the left edge of the page near the Section/Paragraph which has been affected and revised. Inside the triangle will appear the revision number for that current change. The triangle will appear only for those Sections/Paragraphs that have changed.
- 3.6.2 It will not be necessary to delete the triangle from the previous revision, even though it is generally recommended that signs of a previous revision be removed to avoid confusion. It will be acceptable to erase, white-out, or tape over signs of the previous revision, where that page has not been revised and is not being reproduced as a new document.
- 3.6.3 It will not be necessary to apply a revision number to the top of each of those pages that comprise the body of the procedure. The revision number and date need only appear at the top of the Title Page and Data Sheets.
- 3.6.4 No Change will be taken to mean, that no changes have occurred to that page and that the revision number indicates the current status of that page. No dates other than the original effective date will appear on individual pages. Only the Title Page and Data Sheets shall show revision status and date of that revision, along with the triangle at the bottom of the page.
- 3.6.5 No Editorial Change or Format Change will be taken to mean, that the text of that procedure has not changed and that the change affects the page number, section/paragraph number or that information has shifted from one page to another. This will be noted along side the triangle at the bottom of the page.
- 3.7 Where drawings are included in the manual, such as post-tensioning fabricated components, these drawings shall be controlled through the quality manual for that product, except where otherwise agreed to in writing. This system utilizes the drawings and procedures from a controlled quality manual for fabrication and inspection control of that component and shall accompany the purchase order to the vendor, where applicable.

4.0 RESPONSE

- 4.1 Once the revision is received by Exelon the Acknowledgement of Receipt or a facsimile, shall be returned to the Precision Surveillance Corporation, Quality Assurance Section.
- 4.2 Exelon comments shall be referred to the PSC Quality Assurance Section or those personnel responsible for contract coordination.
- 4.3 Exelon approval without comments shall be transmitted in writing to either party noted in Section 4.2 above, however verbal approval shall be sufficient to start work using the approved revision.



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4.3.1 Section 4.2 or 4.3 above, may be replaced by other means of control which have been established and formally agreed to by PSC and Exelon.

5.0 EXELON CONTROL (SUGGESTED)

5.1 As a means of maintaining the controlled manual and revisions at Exelon's facility, it is recommended that the submitted documents be verified for accuracy of inclusion, by comparing them to the Revision Control Sheet. PSC is not immune to errors, regardless of the amount of controls imposed or implied.

6.0 EXPEDITING CONSTRUCTION

- 6.1 In order to expedite the construction schedule and with Exelon's approval, it may become necessary or advantageous to fabricate materials prior to the approval of the revision. All materials fabricated in this situation shall be tagged "Hold" and retained on that status until approval of the revision. At the time of approval the "Hold" tag shall be removed.
- 6.2 If, for some reason, the revision is not approved, the material fabricated or installed under the controls of the revised procedure shall be maintained on Hold status until the revision is approved. Adjustments to the material shall be made, where required, after approval.

7.0 VOID DOCUMENTS

- 7.1 Once approved, the document being revised shall be marked void and dated to reflect the revision date. This void copy will be removed from the manual and placed into a dead or void file for retention as part of the Quality Assurance records.
- 7.2 As a temporary measure, the void copy may be turned backwards in the manual, until removal to the file.
- 7.3 Items fabricated or installed with the use of the previous revisions will not require any subsequent change once fabricated or installed. The date of the document approval shall determine the point of fabrication change over and therefore, the applicable quality requirements.
- 7.4 PSC does not require that void documents be returned.

8.0 FORMS/DATA SHEETS

8.1 Any of the forms contained in this Surveillance I.S.I. Manual or any Quality Control Procedure used as a means of providing quality control or inspection documentation, are subject to change at any time without prior approval of Exelon, providing that the amount of information shown on the original form is not diminished in any way.



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- 8.2 These revised forms shall be submitted for approval at the convenience of PSC with the next revision of that procedure that effects the change, but in no case later than 30 days from the first use of that form.
- 8.3 If the information required of the original or previous revision of that form is to be diminished in any way that form shall be submitted for approval prior to use.
- 8.4 Forms may be provided at any time where not shown in any procedure in order to provide the required quality control or inspection documentation, without prior approval and at the option of the PSC Quality Control or Quality Assurance Sections.

9.0 ATTACHMENTS

9.1 Revision Control Sheet



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Melissa Laha Prepared by Herald F. Bussone	Q.C. INSPECTOR Title Q.A. MANAGER	Date 09/03/13
Mulissa Jana Prepared by	Q.C. INSPECTOR	Date
Melissa Laha Prepared by Herald F. Bussone	Q.C. INSPECTOR Title Q.A. MANAGER	Date 09/03/13



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1.0 NONCONFORMANCE REPORTING

- 1.1 Any item, service, activity or procedure not conforming to the approved drawings, specifications, instructions or other project requirements as related to the PSC contract for the project, shall be documented as a nonconformance. A non-conformance report shall be written by the authority responsible for quality, discovering the nonconformance, regardless of the location where the deficiency was discovered or the source of origin.
- 1.1.1 This reporting shall be completed on a timely basis, preferably immediately upon discovery and consultation. The reporting action should be within one working day from discovery.
- 1.2 All nonconforming items shall be removed to a segregated area.
- 1.3 The nonconformance report shall be distributed to the appropriate parties noted on the distribution list shown on the PSC Nonconformance/Corrective Action (NC/CA) Report Form, which is shown at the end of this procedure. A typical Nonconformance Report Index shall also be seen.
- 1.3.1 Exelon shall receive copies of those nonconformance reports that indicate a loss of control for the manufacturing process, field construction, or quality control system and where it has been determined by PSC Quality Assurance, Quality Control, and/or possibly Exelon, that a measure of input shall be required by Exelon to resolve the deficiency.
- 1.3.1.1 The Recommended Corrective Action for the nonconformance reports noted in Section 1.3.1 above, shall be submitted to Exelon for review and approval prior to the execution of that action, for all items to be dispositioned as "Repair" or Use-As-Is.
- 1.3.1.2 All nonconformance reports shall be submitted to Exelon, whether for review and/or approval.
- 1.4 Acceptance of the nonconforming item, after completion of the corrective action, shall be by inspection.
- 1.5 Once the corrective action has been determined, the Quality Control or Quality Assurance personnel shall make arrangements for the completion of the nonconformance, including verification. The completion of this action shall be documented in the Disposition area provided on the NC/CA Report Form.
- 1.5.1 Once the nonconformance has been corrected and the disposition completed on the NC/CA Report Form, the formal close-out of that report shall be documented in the NCR Index Log. All nonconformance reports shall be closed-out.

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- 1.5.2 In some circumstances, the corrective action may be completed on another document, such as an Exelon nonconformance report. In that case, the PSC NC/CA Report may be closed-out immediately as a result of Exelon's document, and shall be so noted in the Index Log.
- 1.6 Only Quality Control or Quality Assurance personnel shall have the authority to return the nonconforming item to inventory or service, once disposition of the corrective action has been completed and accepted by that Quality authority.
- 1.7 In addition to the normal reporting system for Nonconforming Material and Services, supplemental reports shall be submitted for deficiencies whether a result of design, conformance, fabrication, or performance, that represent a significant breakdown in the Quality Assurance Program and, were they to remain uncorrected, could adversely affect the operation of the item at any time throughout the expected lifetime of the item. These written reports shall be prepared by the PSC Quality Assurance, Quality Control, and/or Engineering Department and submitted to Exelon documenting the cause of the deficiency and the formal corrective action to prevent repetition.
- 1.8 The Nonconformance Reports shall be retained in the appropriate Quality file on site.

2.0 DRAFTING THE REPORT

- 2.1 The following outline shall be used as a guide for developing the Nonconformance Report. Refer to the example at the end of this procedure.
- 2.2 The Nonconformance Report shall indicate the identification of the nonconforming item, the deficiency noted, preferably with reference to the requirement in violation, in the area marked Nonconformance on the NC/CA Report Form.
- 2.3 The Apparent Cause Known shall be entered onto the form, if it can be readily discerned. Overly restrictive or unworkable procedures or specifications may be listed as the cause, as well as changes in working conditions not considered by the procedures or specifications. If this cannot be satisfactorily resolved by the initiator of the report, then it shall be completed by Quality Assurance, Quality Control or the Engineering Department.
- 2.4 The area marked Recommended Corrective Action on the NC/CA Report Form shall indicate the action necessary to immediately correct the deficiency. Usually noted as Use-As-Is; Repair; Rework; Scrap; and any appropriate commentary to substantiate that action.
- 2.4.1 Where nonconforming items are to be corrected by repairing the stated deficiency, the repairs shall be accomplished through the use of an approved repair procedure. This may be shown directly on the NC/CA Report Form or attached to it as a separate document.

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- 2.4.2 Nonconforming items shall be rejected, repaired, reworked or accepted for corrective action after evaluation by the PSC Quality Assurance, Quality Control, Engineering and/or Exelon.
- 2.5 Where possible, the Corrective Action to Prevent Recurrence area of the NC/CA Report Form, shall provide the long range action that may be instrumental in preventing recurrence of that deficiency entered onto the form.
- 2.6 The determination of Significant Condition status shall be performed by the Quality Assurance, Quality Control and/or the Engineering Department. The identification of significant conditions adverse to quality, their cause and the appropriate corrective action to resolve the condition shall be documented on the NC/CA Report Form or in a separate report as noted in Section 1.7 of this procedure.
- 2.6.1 A significant condition adverse to quality shall exist if one or more of the following elements are required:
- 2.6.1.1 A significant investigation is necessary to determine the cause.
- 2.6.1.2 Significant redesign, repair or rework of the item.
- 2.6.1.3 A significant evaluation of the QA/QC Program implementation.
- 2.6.1.4 Significant evaluation for determining generic implication.

3.0 NONCONFORMANCE REPORT NUMBERING

- 3.1 All Nonconformance Report Numbers shall be prefixed with the PSC project Contract Number.
- 3.2 All Field originated NCR's shall prefix the project Contract Number with the letter "F".
- 3.3 Non-project oriented NCR's shall be prefixed with QA and shall only be issued through the Quality Assurance Section.
- 3.4 All NCR's shall be assigned a sequential control number, to follow the prefix number, which shall be applied in ascending order from the previous report and originating with the number "1".

4.0 PROCESSING NONCONFORMANCE REPORTS

4.1 This is intended to provide PSC Field Quality Control personnel with the means of approving processing or closing out NCR's where they are not in close proximity to the home office.



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- 4.2 The report may be drafted by independent action or with the assistance of the Engineering or Quality Assurance Sections. Where input has been provided by the assistance of others, the Quality Control person drafting the report shall print the name of that person assisting and the date in the respective area of that Section of the Nonconformance/Corrective Action Report Form. The report should be distributed as soon as it is drafted, unless the disposition of the corrective action takes place within 5 days after discovery of the deficiency; in this instance, the distribution will probably take place after the disposition is complete.
- 4.3 The PSC Approval for QA, QC and/or Engineering may be communicated by telephone to expedite corrective action. In which case the Quality Control person on site would print the name of the person approving that action and the date. Those NCR's could be initialed at a later date to formally complete the approval actions.

5.0 DOCUMENTATION

- 5.1 Included with this procedure are the various tags and control sheets described in this procedure.
- 6.0 ATTACHMENTS
- 6.1 Tags and Sample Logs (Example)
- 6.2 Sample NC/CA Report
- 6.3 NC/CAR Form
- 6.4 NCR Index Form
- 6.5 Hold Tag Index Log
- 6.6 Reject Tag Index Log

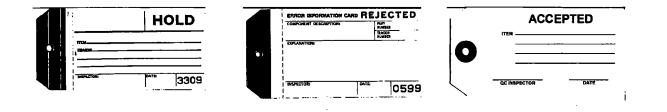


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NONCONFORMING MATERIALS, PARTS OR COMPONENTS

TAGS

Shown below are typical examples of Hold, Reject and Acceptance tags. They may vary in appearance but, are representative of the format and information to be provided. All but the Acceptance tag, are two-part tags.



SAMPLE LOG ENTRIES

Shown below are typical examples of entries made into each respective log. Note that some are cross-referenced such as HOLD 1100 to Reject 1700; and HOLD 1103 to Reject 1701.

QUALITY ASSURANCE PROGRAM			PSC		
Project	Date	Decembra of Constitute		Date	ac
Teg No.	Issued	Description of Candition		Removed	Signoff
1100	5-1-05	Archae RECIOI DAMAGED		5-2-05	CB
1101	5-6-05	DOLLANGATATION INCOMPLETE .R	ano 36	5-8-05	DMW
1102	6-4-05	TENDEN ACIOI - FIRD END GUT	4 4	6000	es
1103	6-15-05	RUSTY TELOON V135		6-16-05	JUK
1104	7.2.05	Childre TO COUPLE TO TENDON 1	/14		

QU	QUALITY ASSURANCE PROGRAM REJECT TAG LOG				
Project:					
Tag No.	Date Issued	Description of Condition		Data Removed	QC Signoff
1700	5-2-05	SEE HOND THAN 1100 - SCRAP HE	AP	5-4-05	JWK
1701	6-16-05	SEE HOLD THE 1103 - SERAP TEL	want	6-30-05	Onw
1702	6-21-05	DRUM OF GREASE CONSAMULATED.	501AP	613-05	CB
1703	6-30.05	ANDIAL HUROS DAMAGED - SC	EAP	630-05	CB
1704	1.2.05	Some Damageo - HT#43691.5	CRAP	7-2-05	CB
	1				

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NONCONFORMANCE/CORRECTIVE ACTION REPORT FORM - SAMPLE

	CONFORMANCE / CORRE	ECTIVE ACTION REPO				
HOLD TA	G NO.:	NC / CA NO.:			No.	
NONCONFORMAN	CE: nformance preferable refer	rencing the quality prog	gram requirement that	has bee	Enter NCR N and also into	
APPARENT CAUSE	2.1 of Procedure QA 9. KNOWN: VES sultation with QA, QE and/	\`	DESCRIBE: to Section 2.2 of Proc	cedure 9.	Log. The NC is the Project prefixed with FN123-001).	Number,
The immediate of	ORRECTIVE ACTION: corrective action that will be	a taken to correct the s cy as it applies; "Use A	tated nonconformanc	e. One of	f the following	
Refer to Section	2.3 of Procedure 9.0.				Enter the Hol applicable. If applied, note	a tag was
	MING ITEM TO BE REPAIRED		ED REPAIR PROCEDUR	i. 	in the Dispos	ition
The long range of Refer to Section	corrective action that may 2.4 of Procedure 9.0.	be useful in eliminating	the deficiency or red	ucing the C	frequency.	
INITIATOR:		NO IF YES,	REFER TO QAM SECTIO	DATE:	A "Yes" only l an evaluation consultation v and/or Engine	and with QA, QE
Enter any comm Refer to Section PSC	ents that might be pertined 25. of Procedure 9.0.	nt to effecting the appro	oval of the corrective	ENGINEE	To be signed indicated. Ma signed by Init	aybe
Enter any comm Refer to Section PSC APPROVAL	25. of Procedure 9.0.		oval of the corrective a		indicated. Ma signed by Init the Dept. des	ay be liator only if
Enter any comm Refer to Section PSC APPROVAL SIGN & DATE: OWNER / AGENT A REQUIRED VE	25. of Procedure 9.0.	A CA	QA 	ENGINEE	indicated. Ma signed by Init	ay be liator only if
Enter any comm Refer to Section PSC APPROVAL SIGN & DATE: OWNER / AGENT A REQUIRED VE	25. of Procedure 9.0.	his agent. Refer to Se	QA DATE ction 1.3.1.1 of Proce	dure 9.0.	indicated. Ma signed by Init the Dept. des	ay be liator only if

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	NONCONFORMAN	ICE / CORRECTIVE ACT	ON REPORT FORM	
HOLD TAG NO.:		N	C / CA NO.:	
NONCONFORMANCE:				
APPARENT CAUSE KNOW	/N: 🗍 YES		, DESCRIBE:	· · · · · · · · · · · · · · · · · · ·
RECOMMENDED CORREC	TIVE ACTION:			
ANY NONCONFORMING IT			VED REPAIR PROCEDUR	E.
INITIATOR:		TITLE		DATE:
SIGNIFICANT CONDIT APPROVAL COMMENTS:	ION: YES		IF YES, REFER TO QAM	SECTION 15.
PSC APPROVAL SIGN & DATE:	QC	QA	Ē	NGINEERING
EXELON APPROVAL REQUIRED			DATE	
COMMENTS:	G	A	DATE	
	DISTRIBUTION		DISPOSI	
			SIGNED:	·····



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	NONCONFORMAN	CE REPOR	F INDEX L	.OG		
ICR#	DESCRIPTION	v	DATE /RITTEN	DATE SUBMITTED	DATE APPROVED	DATE COMPLETE
``						
		i				
			· _		· · · · ·	



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		HOLD TAG INDEX LOG		
TAG#	DATE ISSUED	DESCRIPTION OF CONDITION	DATE REMOVED	QC SIGNOFF
,.				
<u>. </u>		<u> </u>		
		· · · · · · · · · · · · · · · · · · ·		
			· · ·	
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Page ____ of ___

		REJECT TAG INDEX LOG		
TAG#	DATE ISSUED	DESCRIPTION OF CONDITION	DATE REMOVED	QC SIGNOF
<u> </u>		<u></u>		
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. <u> </u>		······································		
		· · · · · · · · · · · ·		<u></u>
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N1091 PSC PROCEDURE QA 10.0 CALIBRATION 09/03/13 Page 1 of 5 Revision 0

ÚNIT 1 (4	EXELON REE MILE ISLAND 40 TH YEAR) PHYSICAL LDING TENDON SURVEILLANC	E
IN-SE	RVEILLANCE CORPORATION RVICE INSPECTION CONTROL PROCEDURE	
	ATION OF MEASURING TEST EQUIPMENT	
AND		· .
AND Melissa Jara	TEST EQUIPMENT	09/03/1
AND	TEST EQUIPMENT	09/03/1 Date
AND Mulissa Jara Prepared by	TEST EQUIPMENT	
AND Mehisla Jara Prepared by Gerald F. Bussone Approved by	C.A. MANAGER	Date
AND Mehista Lara Prepared by Herald F. Bussone	Q.A. MANAGER Title PROJECT MANAGER, P.E.	Date 09/03/1



1.0 CALIBRATION REQUIREMENTS

1.1 This procedure will establish the requirements for calibration of the Quality Control Test and Measuring Equipment to be used for inspection, testing and evaluation, during the In-Service Inspections (Surveillance) of the Post-Tensioning System Tendons.

2.0 CONTROLS

- 2.1 All calibrated test and measuring equipment shall be controlled for issue by the PSC Quality Control or Quality Assurance Section. The area of issue shall be indicated on the calibration records. The calibration records shall be maintained by the PSC Quality Control or Quality Assurance Section.
- 2.2 PSC Quality Control personnel shall maintain a file or list of in-service devices requiring calibration, and periodically review those records to prevent any lapse in calibration.
- 2.3 The Quality Assurance Section shall review calibration records during audits of that operation being audited.
- 2.4 All calibrated equipment shall be documented and identified by a label, tag, or log sheet indicating the status of calibration. The control device shall identify the equipment, the date of calibration, date due for recalibration and the signature or initials of the person performing or verifying the calibration.
- 2.5 The identification control of the calibrated equipment shall be of such a nature so that the specific traceability of that device will not be lost; usually engraved or marked with a Quality Control code number.
- 2.6 Any calibrated device that has been damaged, adjusted or repaired before the recalibration due date, shall be recalibrated before initial use, to assure the prescribed accuracy.
- 2.7 There is no intent to apply calibration requirements on those devices such as tapelines, levels, etc. where normal commercial practices provide adequate accuracy, or where there is no need for accuracy.
- 2.8 Procedures shall be provided for the calibration of special testing, measuring, inspection devices or other equipment requiring calibration and shall be controlled by the Quality Assurance Section or included in the Surveillance I.S.I. Manual for the project.
- 2.9 The Rams which have been used for Monitoring Force, Detensioning or Retensioning operations for the In-Service Inspection of the Post-Tensioning System Tendons shall be verified for calibrated status after the completion of the work.



2.10 The documents for the calibration of Rams prior to starting the work and after completing the work shall be included with the Final Report for the In-Service Inspection.

3.0 OUT OF CALIBRATION

- 3.1 Devices out of calibration shall be processed as nonconformances. Devices out of calibration that are determined to have an adverse effect on quality shall have copies of that nonconformance report submitted to Executive Management for review, and comments where applicable.
- 3.1.1 Nonconformance Reports shall be drafted, submitted and distributed in accordance with the requirements of PSC Procedure QA 9.0.
- 3.2 Instruments that are found to be out of calibration shall be re-calibrated and a comparison made of the results of the new calibration and the out-of-calibration variance, if any. If no significant variation exists, the instrument shall be put back into service. In the event that a discrepancy exists, then the Engineering and/or Quality Assurance and Quality Control Sections shall make an evaluation of the discrepancy and the possible effect on the items processed with the out-of-calibration device, with regard to quality, accuracy or reliability. If it is determined that a serious problem exists, then the Quality Assurance Section shall determine what items checked with the out-of-calibration device.
- 3.3 Instruments that are found to be in excess of the required accuracy or tolerance band after being returned from Field Service, shall be controlled with Nonconformance Reports as required of Sections 3.1 and 3.2 of this Procedure.

4.0 TOOL AND GAUGE CONTROL

- 4.1 The calibration standards used to calibrate measuring and test equipment shall be traceable to the National Institute of Standards and Technology (NIST) and shall be controlled to an accuracy not to exceed a limit of 25% of the tolerance of the equipment being calibrated or the smallest used division of that instrument's scale, unless otherwise limited by "State-of-the Art" conditions. Pressure Gauges used for Post-Tensioning System operations shall be excluded from this requirement and shall be defined for accuracy in separate procedures.
- 4.1.1 For example, a micrometer that has a smallest scale reading of 0.001" shall be calibrated with a standard or device that has been calibrated to an accuracy or 0.00025" or less.
- 4.2 All measuring and test equipment used for Quality Control Inspections shall have subdivisions or increments for measurements that are equal to or smaller than the tolerance of the parameter being measured.



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- 4.2.1 For example, a part needs to be controlled to a dimension of 9.365" with a tolerance of plus or minus 0.001". It would therefore be acceptable to perform that measurement with a device that is capable of measuring to 0.001" or smaller.
- 4.3 Calibrated Devices may be extended for the stated period of frequency, where that device has been calibrated and placed into storage, rather than into service. The original frequency period stated in Section 5.2, Equipment List, shall always be observed.

5.0 EQUIPMENT

- 5.1 The Equipment List shown in Section 5.2 of this Procedure contains those devices that are required for the In-Service Inspection or are used to calibrate devices that will be used during the In-Service Inspection. The required accuracy and frequency of calibration are stated for each device. It should be noted that the accuracy requirement is meant to be the tolerance band to which the device is being calibrated and not the original accuracy or the accuracy between calibration frequencies.
- 5.1.1 The term "DISS" in the Accuracy Column is defined as "Division of that Instrument's Smallest Scale".
- 5.1.2 Where an asterisk "*" follows the accuracy dimension, this is meant to be that the dimension shown shall be verified with a Micrometer that reads to 0.0001".
- 5.1.3 The procedures that are used to calibrate the various types of equipment, gauges or instruments used during the In-Service Inspection, will accompany this procedure in the Surveillance I.S.I. Manual. These procedures provide information relative to the calibration of each device and may be used for purposes of calibrating these devices in the field, should that become necessary.



5.2 EQUIPMENT LIST

DEVICE	FREQUENCY	ACCURACY
Load Cell (3000 Kips)	5 Years	+ .1% FS Entire System
Load Cell (Approx 50 Kips)	8 Years	+ .1% FS Entire System
Rams/Jacks	Beginning & End	Calculated to within
(Stressing, Testing, etc.)	(B & E) of Project	+ 0.01 square" for Ram Area
Dead Weight Tester	5 Years	± 0.10% FS
Heise Digital Gauge	3 Years	<u>+</u> 0.10% FS
Pressure Gauge-Master (1/4%)	1 Year	<u>+</u> 30 psi
Pressure Gauge-Stressing (1/4%)	1 Year	<u>+</u> 30 psi of Heise
Pressure Gauges (1/2%)	1 Year	+ 55 psi of Heise
(Not used for Stressing)		
Micrometer	6 months	± 1 DISS
Micrometer-Checking Bar Standard	1 Year	<u>+</u> 0.0001"
Thickness (Feeler) Gauge		
Under 0.005"	1 Year	<u>+</u> 0.0005"*
0.005" and Over	1 Year	<u>+</u> 0.001"
(* Verified with a 0.0001" micrometer)		
Steel Ruler	1 Year	<u>+</u> 0.01"
Thermometer	1 Year	± 1 DISS
Optical Comparator	1 Year	<u>+</u> 0.001"
Dial Indicator	1 Year	<u>+</u> 1 DISS

6.0 DOCUMENTATION

6.1 The various types of documents generated for calibration and/or status of calibrations will be described in the General Procedures for Calibration or contained within that procedure for a particular device. Others may be added as the need arises. Quality Control personnel shall prepare or assist in the preparation of these records. A copy of the calibration record shall accompany the calibrated device to the field.



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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **VERIFICATION OF CALIBRATION STATUS OF HYDRAULIC PRESSURE GAUGES** Melissa Lara Q.C. INSPECTOR 09/03/13 Prepared by Title Date Gerald F. Bussone Q.A. MANAGER 09/03/13 Approved by Title Date Paul PRESIDENT 09/03/13 Approved by Title Date. 45 QA 10.1 TMI.13 ISI



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1.0 FIELD VERIFICATION OF PRESSURE GAUGES

1.1 The following procedure shall be used to verify the calibration of hydraulic pressure gauges during field operations. These gauges may be used in stressing operations with the rams or other devices that require a measure of accuracy to produce quality results. Frequency and Accuracy of Calibration shall be controlled as stated in Section 5.2 of Procedure QA 10.0 Equipment List. The Verification frequency shall be controlled as stated in Section 2.5 of this Procedure, while the Verification Accuracy shall be controlled as stated in Sections 3.6 or 3.7.

2.0 GENERAL

- 2.1 Prior to being used for any work, all gauges shall be calibrated with the use of a Dead Weight Tester or the Heise Digital electronic pressure indicator.
- 2.2 In addition to the pressure gauges used during the surveillance, one gauge, designated as the Master Gauge or a Heise Digital Gauge, shall be set aside for purposes of Calibration Verification during the process of the work. Prior to use the Master Gauge or Heise Digital Gauge used for Calibration Verification shall have been calibrated per PSC Procedure Q12.8.C-W with a dead weight tester traceable to the NIST.
- 2.3 PSC Quality Control personnel shall maintain the controls for distribution and recall of each Pressure Gauge being used on site.
- 2.4 A Pressure Gauge may be verified for calibration or accuracy at shorter frequencies than stated in Section 5.2 of Procedure QA 10.0. It is important that verification be performed any time that the gauge has been damaged, subjected to some physical abuse or there is some reason to suspect its accuracy.
- 2.5 Pressure Gauges used for Detensioning or Retensioning (Stressing) tendons of Post-Tensioning Tendon Systems during In-Service Inspections of Nuclear Power Plants, shall be Verified for Calibrated status at least once a day during the operational use of those gauges.

3.0 VERIFICATION OF CALIBRATION

- 3.1 Clean and remove any dirt, grease or residue that could affect the accuracy of the calibration or use of the pressure gauge.
- 3.2 At the option of the PSC Quality Control Section it shall be acceptable to use a Heise Digital Pressure Indicating Gauge for Calibration Verification of Pressure Gauges, rather than a Master Gauge.
- 3.3 Attach the Pressure Gauge to the Calibration Pump of the Heise Indicator or Master Gauge.



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- 3.4 Close the back pressure valves before pressurizing the system.
- 3.5 Increase the hydraulic pressure to the point of the desired reading on the Pressure Gauge, usually 1,000 psi plus or minus 100 psi increments. Take a reading of the Pressure Gauge and the Heise Indicator and document both on the Pressure Gauge Calibration Form.
- 3.6 MASTER GAUGE (1/4% Accuracy)
- 3.6.1 Where a Master gauge is used for verification of calibration, the master gauge and field gauge to be calibrated shall be connected to a common line (manifold) on a hydraulic pump. The pump shall be pressurized in no greater than 1,000 psi increments, plus or minus 100 psi, to the highest overstress pressure that shall be encountered during stressing activities; for example, 7,600 psi overstress will require calibration on that gauge to at least 7,600 psi. It shall be acceptable to go to 8,000 psi.
- 3.6.2 The accuracy of a gauge verified in this manner shall be acceptable, if it reads to within 50 psi of any reading on the Master Gauge.
- 3.7 HEISE DIGITAL GAUGE
- 3.7.1 A Pressure Gauge may be verified for calibration by connecting that gauge and the Heise Digital Gauge to a common line, which is in turn connected to a hydraulic pump and pressurized to the same values noted in 3.6.1 above.
- 3.7.2 The verification accuracy of that Pressure Gauge shall be acceptable if it reads to within 30 psi of the Heise Digital Gauge reading for a 1/4 percent accuracy gauge or 55 psi for 1/2 percent accuracy gauge. As a 1/2 percent gauge cannot be accurately interpolated to increments of 5 psi it will be acceptable to take the reading to some point equal to or above 50 psi but not to exceed 60 psi.
- 3.7.3 Pressure Gauges with an accuracy of 1/2 percent or greater shall not be used for Monitoring Force, Detensioning or Retensioning operations of the Post-Tensioning Tendon System during In-Service Inspections.
- 3.8 With the Verification and Documentation of the Pressure Gauge being acceptable, the pump and gauge shall be depressurized and prepared for disassembly.

4.0 UNACCEPTABLE CONDITIONS

4.1 If a Pressure Gauge fails to meet the accuracy requirements of Section 3.6.2 or 3.7.2 after being used for Stressing or Detensioning operations, it shall be necessary to draft a Nonconformance Report in accordance with the requirements of Section 3 of Procedure QA 10.0, to control that Gauge and any Tendons worked with that Gauge.



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- 4.2 Any Pressure Gauge not capable of meeting the stated accuracy requirements of Section 3.6.2 or 3.7.2 for the method of calibration being used, shall be returned to the PSC shop for adjustment or repair. Any repaired or adjusted Gauge shall be recalibrated before use.
- 4.3 ZERO ALIGNMENT (Zero Beating)
- 4.3.1 On occasion, the Pressure Gauge Indicating Needle may not be in precise alignment with the Zero mark on the Gauge Face, necessitating realignment. Before calibration the needle is to be realigned to the zero mark, with the realignment completed the Verification shall be performed and documented.

5.0 ACCURACY VARIATIONS

- 5.1 Even though Pressure Gauges that have been calibrated or verified for calibration, variations in excess of the requirements of Sections 3.6.2 and 3.7.2 may be detected between calibrations or verifications. In an effort to explain and control this deficiency, this Section shall be reviewed before the Verification of any Pressure Gauges.
- 5.2 The accuracy of the calibration of Pressure Gauges or the verification of calibration is highly dependent on the accuracy of the reading of the location of the Pressure Indicating Needle on the Gauge Face. While there is an attempt to precisely align the needle with the Gauge Face Indicating Line, it is nearly impossible to maintain that control. In an effort to explain any variations that could be noted between calibrations or verifications, it is recommended that a notation be added to the Calibration Document to signify that the intended increment was not precisely obtained. At that increment it would be noted that the value actually achieved was plus or minus an extrapolated pressure noted during the calibration.
- 5.2.1 For example: If the target increment on the gauge Face was intended to be 2,000 psi and the Indicating Needle was somewhat over the 2,000 psi line, perhaps enough to interpret as 10 psi, the notation on the Calibration Record would read:

2,000 psi +10

5.2.2 The requirements for Stressing or Detensioning Tendons do not require the Pressure to be read any finer than 10 psi during the In-Service Inspections. The Hydraulic Ram Calibration Procedure takes the reading error into account for Stressing or Detensioning along with any other errors that may occur as a result of calibration or gauge reading, thereby maintaining the accuracy or integrity of the work being performed. It is therefore necessary to document any minor variations during calibration or verification activities, so as to maintain the integrity of the accuracy of the Pressure Gauges.



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6.0 DOCUMENTATION

- 6.1 A gauge Calibration Record form shall be prepared for each gauge being calibrated or verified. All pertinent information as required by the form shall be posted during calibration or verification.
- 6.2 Calibration or verification documents shall be retained in the appropriate jobsite Quality file.

7.0 ATTACHMENTS

7.1 Gauge Calibration Record Form.

PRECISION SURVEILLANCE	N1 GAUGE (091 PSC PROCEDURE QA 10. CALIBRATION RECORD FORM 09/03/13 Page of Revision (
Project: TMI NUCLEAR PLANT UNIT 1 – 40 th Year	Jot	o#N1091
GAUGE CALIBRATIO	VERIFICATION RECORD	
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
QC SIGN OFF		
Project: TMI NUCLEAR PLANT UNIT 1 – 40 th Year	Jol	o#N1091
GAUGE CALIBRATIO	N VERIFICATION RECORD	
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
REMARKS		
QC SIGN OFF		

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EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **QUALITY CONTROL INSPECTION** Melissa Lara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date PRESIDENT 09/03/13 Approved by Title Date 46 QA 11.0 TMI.13 ISI

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1.0 QUALITY CONTROL INSPECTIONS

- 1.1 Where Precision Surveillance Corporation is not acting as the General Contractor for the Post-Tensioning operations, Quality Control Inspections shall be performed by the organization responsible for the quality control function of that portion of the work they are performing, as stated in PSC Procedure QA 4.0 of this manual, or as agreed to in the contract documents.
- 1.2 It is PSC's intent to provide the Quality Control activities for the Surveillance Inspection of the Post-Tensioning Tendon System as agreed to in the contract documents and as stated in the Surveillance I.S.I. Manual.
- 1.3 Quality Control documents shall NOT BE SIGNED until all information for the inspections or tests for which that document is being generated have been entered onto that document.
- 1.3.1 Partially completed inspection or tests, those where the operation cannot be completed on the same day, shall be initialed and dated by the Inspector for those items that have been completed and require documentation.
- 1.3.2 Partially completed inspections or tests, those where the operation is interrupted by a temporary condition such as lunch or a break and where the operation shall be completed the same day, may be initialed completed by the Inspector to that point, for those items that have been completed and require documentation.
- 1.4 Quality Control documents that are being reviewed for completeness but were not witnessed by the reviewer shall be signed for that review ONLY AFTER completion of the review and NOT BEFORE.
- 1.5 A Quality Control document is defined as any document or record that contains a Quality Control Inspector signature requirement.
- 1.6 All inspections shall be documented on the appropriate inspection form for those operations witnessed on that day. All inspection documents shall be signed or initialed, dated and retained in the appropriate Quality file at the jobsite.
- 1.7 Quality Control Documentation shall be completed and turned in for review as soon as possible after completion of that Inspection Test or Evaluation.
- 1.8 Reviews of Quality Control Documentation should be completed within 24 hours of receipt or sooner to verify that the information is accurate and complete. Errors or deficiencies shall be resolved without delay.

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- 1.9 There are a number of Quality Control Documents that may not be completed in one day or require posting to another document. It is advisable to make reproductions of these documents and use these to complete whatever actions are necessary, while retaining the original document, even though incomplete, in a Quality Control file. The additional information can be entered onto the original document until completed. Leave the reproduced copies attached to the back of that document until the review is completed, at which time the reproductions may be disposed of.
- 1.10 It may be necessary to generate more than one original copy of a Quality Control Document for an Inspection or Test on a tendon. This shall be acceptable just so the total quantity of pages and the page number appear on each document.

2.0 INSPECTION

- 2.1 The term Inspection is meant to include:
- 2.2 The witnessing of an operation that generates Quality Control Data which is documented by the Inspector.
- 2.3 The performance of some operation by the Inspector, such as measuring or other Quality Control Data, which is documented by the Inspector.



EXELON THREE MILE ISLAND UNIT 1 (40TH YEAR) PHYSICAL CONTAINMENT BUILDING TENDON SURVEILLANCE PRECISION SURVEILLANCE CORPORATION **IN-SERVICE INSPECTION** QUALITY CONTROL PROCEDURE **AUDITS** Mulissa Jara Prepared by Q.C. INSPECTOR 09/03/13 Title Date Gerald F. Bussone Approved by Q.A. MANAGER 09/03/13 Title Date Part C. Lin PRESIDENT 09/03/13 Approved by Title Date 47 QA 12.0 TMI.13 ISI





1.0 AUDITS

- 1.1 Surveillance operations shall be audited as required by the project specifications or as agreed to in the contract documents, to verify conformance with the approved job related manuals and procedures.
- 1.2 Audits shall be performed by qualified personnel of the Precision Surveillance Corporation Quality Assurance Section and who shall be independent of the area being audited.
- 1.3 Audits shall be performed using a checklist prepared prior to the audit, with the results documented on a Jobsite Audit Summary Sheet and a commentary noted on an Audit Finding Report form or similar type documents.
- 1.4 Audits shall be performed on a random basis and shall be scheduled when a variety of operations are being performed or as a specific activity occurs.
- 1.5 Subsequent audits shall provide a review of previously noted deficiencies or program non-compliance to ensure appropriate action has been taken to resolve those areas of concern.
- 1.6 Copies of the audit report shall be maintained in the appropriate jobsite quality files and distributed in accordance with the project specifications or distribution list on the audit checklist.
- 1.7 The audits shall be performed as early in the life of the In-Service Inspection, as is practical, and must consider the limitations of the scaffolding or platforms.
- 1.8 The elements to be audited shall be commensurate with the status and importance associated with the In-Service Inspection activities.
- 1.9 Exelon has the right of access for the performance of quality audit.
- 1.9.1 Any findings noted as a result of an Exelon audit shall be addressed by Precision Surveillance Corporation on a timely basis with corrective action as approved by Exelon.

47 QA 12.0 TMI.13 ISI



Project: TMI NUCLEAR PLANT UNIT 1 – 40th Year

9-23-2013

44083

9-24-13

CHW 9-24-13

CC-138750

NGNE

NONE

CC 13 8756

Job # N1091

GAUGE CALIBRATION VERIFICATION RECORD

DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS

MASTER GAUGE (PSI) JACK GAUGE (PSI) 990 1000 1990 2000 2990 3000 3990 4000 4990 5000 6000 6000 7000 7000 WRR 9-23-2013

QC SIGN OFF

Project:	TMI NUCLEAR F	PLANT UNIT	1 – 40 th Year
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Job # N1091

GAUGE CALIBRATION VERIFICATION RECORD

DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. 44083

REMARKS

QC SIGN OFF

MASTER GAUGE (PSI) JACK GAUGE (PSI) 1000 1000 1990 2000 3000 3000 40 00 4000 5000 5000 U080 6000 7000 7000

45 QA 10.1 TMI.13 ISI





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	R PLANT UNIT 1 – 40 th Year	J(ob #N1091
	GAUGE CALIBRATION V	ERIFICATION RECORD	
DATE CHECKED	9-27-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	<u>9-27-13</u> CC-138756	1000	980
MASTER GAUGE I.D.	44083	2000	1980
REMARKS	NONE	3000	2980
		4000	3980
		5000	4990
		6000	6000
		7000	1000
QC SIGN OFF	(GW 9-27-13		
QC SIGN OFF	CAW 1-21-13		
	AR PLANT UNIT 1 - 40 th Year		lob #N1091
		VERIFICATION RECORD	00 #
	GAUGE CALIBRATION	VERIFICATION RECORD	
	GAUGE CALIBRATION	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 CC 138756	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 10-1-2013 10-1-2013 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 980 1980
GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 CC 138756	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 980 1980 2990
GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 10-1-2013 10-1-2013 44083	MASTER GAUGE (PSI) 1000 2000 3000 4000	JACK GAUGE (PSI) 980 1980 2990 4000
GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 10-1-2013 10-1-2013 44083	MASTER GAUGE (PSI) / DOD 2000 3000 4000 SOD	JACK GAUGE (PSI) 980 1980 2990 4000
GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATION 10-1-2013 10-1-2013 10-1-2013 44083	MASTER GAUGE (PSI) 1000 2000 3000 4000	JACK GAUGE (PSI) 980 1980 2990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS QC SIGN OFF	GAUGE CALIBRATION 10-1-2013 10-1-2013 10-1-2013 44083	VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 S000 6000	JACK GAUGE (PSI) 980 1980 2990 4000 5000 6000

PRECISION SUBMERCLA	ANCE	GAUGE C	91 PSC PROCEDURE QA 10. ALIBRATION RECORD FOR 09/03/1 Page of Revision
Project: TMI NUCLEA	R PLANT UNIT 1 – 40 th Year	Job	# <u>N1091</u>
	GAUGE CALIBRATI	ON VERIFICATION RECORD	
DATE CHECKED	10-2-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	CC138755	1000	990
	44083	2000	1990
REMARKS	None	3000	3000
-		4000	4000
-		5000	5000
-	****	6000	6000
		7000	7000
		8000	8000
QC SIGN OFF	W. Rome Rolling		
Project: TMI NUCLEA	AR PLANT UNIT 1 - 40 th Year	doL	9#N1091
Project: <u>TMI NUCLEA</u>		Job	9#N1091
	GAUGE CALIBRAT		
DATE CHECKED	GAUGE CALIBRAT	ION VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI)
DATE CHECKED GAUGE I.D.	GAUGE CALIBRAT <u>/0-3- 201う</u> CC 1 38 755	ION VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3- 2013 CC 138755 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT <u>/0-3- 201う</u> CC 1 38 755	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000	JACK GAUGE (PSI) 990 1990 2990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3- 2013 CC 138755 44083	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 2990 3990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3- 2013 CC 138755 44083	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000	JACK GAUGE (PSI) 990 1990 2990 3990 5000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3-2013 CC 138755 44083	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 990 1990 2990 3990 5000 6000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3-2013 CC 138755 44083 Nowe	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 6000 6000 7000	JACK GAUGE (PSI) 990 1990 2990 3990 5000 6000 7000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRAT 10-3-2013 CC 138755 44083	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 990 1990 2990 3990 5000 6000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	GAUGE CALIBRAT 10-3-2013 CC 138755 44083 Nowe	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 6000 6000 7000	JACK GAUGE (PSI) 990 1990 2990 3990 5000 6000 7000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	GAUGE CALIBRAT 10-3-2013 CC 138755 44083 Nowe	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 6000 6000 7000	JACK GAUGE (PSI) 990 1990 2990 3990 5000 6000 7000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	GAUGE CALIBRAT 10-3-2013 CC 138755 44083 Nowe	ION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 6000 6000 7000	JACK GAUGE (PSI) 990 1980 2990 3990 5000 6000 7000

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N1091 PSC PROCEDURE QA 10.1 GAUGE CALIBRATION RECORD FORM 09/03/13 Page ____ of ____ Revision 0

Project: TMI NUCLEAR PLANT UNIT 1 – 40th Year Job# N1091 **GAUGE CALIBRATION VERIFICATION RECORD** DATE CHECKED MASTER GAUGE (PSI) JACK GAUGE (PSI) 10-8-2013 GAUGE I.D. (138755 990 1000 MASTER GAUGE I.D. 44083 1990 2000 REMARKS None 2990 3000 4000 4000 500 5000 6000 6000 7000 7000 At Int QC SIGN OFF Project: TMI NUCLEAR PLANT UNIT 1 - 40th Year Job # N1091 GAUGE CALIBRATION VERIFICATION RECORD DATE CHECKED 10-9-13 MASTER GAUGE (PSI) JACK GAUGE (PSI) CC-138755 GAUGE I.D. 1000 1000 MASTER GAUGE I.D. 44083 2000 1000 A REMARKS 1)9 x) E 2990 3000 4000 4000 5000 5000 6000 1000 7000 7000 Cota Int QC SIGN OFF 45 QA 10.1 TMI.13 ISI



		ION VERIFICATION RECORD	
DATE CHECKED	10-9-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	CC-130756	1600	1000
MASTER GAUGE I.D.	44083		1980
REMARKS	NONE	3000	21980
	• • • • • • • • • • • • • • • • • • •	4000	3990
			4990
		6000	6000
	. 1	7000	7000
	Att. Wt		
QC SIGN OFF	11001. 1 11/	I	I
		L	
	EAR PLANT UNIT 1 40 th Year		DD #
	EAR PLANT UNIT 1 40 th Year	JI TION VERIFICATION RECORD	ob # <u>N1091</u>
Project: <u>TMI NUCLE</u> DATE CHECKED	EAR PLANT UNIT 1 40 th Year		DD # N1091 JACK GAUGE (PSI
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD MASTER GAUGE (PSI)	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	MASTER GAUGE (PSI)	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	MASTER GAUGE (PSI)	
Project: TMI NUCLE DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	MASTER GAUGE (PSI)	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000	
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	EAR PLANT UNIT 1 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000	





oject: TMI NUCLEA	R PLANT UNIT 1 – 40 th Year	Job	# <u>N1091</u>
	GAUGE CALIBRATION	VERIFICATION RECORD	
ATE CHECKED	10-14-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
AUGE I.D.	CC138756	1000	980
ASTER GAUGE I.D.	440837 WRR 10-14-13	2000	1980
EMARKS	None	3000	2980
•		4000	3980
		5000	4990
		6000	6000
		7000	7600
		0.000	8000
QC SIGN OFF	W, R, Polle-		
	AR PLANT UNIT 1 - 40 th Year		
Project: <u>TMI NUCLE/</u>	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATION	Job VERIFICATION RECORD	5#N1091
Project: <u>TMI NUCLE</u>	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10-14-2013	Job VERIFICATION RECORD MASTER GAUGE (PSI)	D# N1091 JACK GAUGE (PSI)
Project: <u>TMI NUCLEA</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10-14-2013 (C138755	Job VERIFICATION RECORD MASTER GAUGE (PSI) (OCO	D# N1091 JACK GAUGE (PSI) 990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 14 - 2013 (C13 & 755 44083	Jot VERIFICATION RECORD MASTER GAUGE (PSI) (OO) 2000	D# N1091 JACK GAUGE (PSI) 990 1990
	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10-14-2013 (C138755	Job VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000	0# N1091 JACK GAUGE (PSI) 990 (990 2990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 14 - 2013 (C13 & 755 44083	Job VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 3000 4000	D# N1091 JACK GAUGE (PSI) 990 1990 2990 4000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 14 - 2013 (C13 & 755 44083	Job VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 3000 4000 5000	D# N1091 JACK GAUGE (PSI) 990 1990 2990 4000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 14 - 2013 (C13 & 755 44083	Job VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 3000 4000 5000 6000	0# N1091 JACK GAUGE (PSI) 990 1990 2990 4000 5000 6000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION <u>10 - 14 - 20 1 3</u> <u>CC 13 8 755</u> <u>44083</u> <u>A/ONR</u>	Jot VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000 7000	D# N1091 JACK GAUGE (PSI) 990 (990 2990 400 2990 400 5000 5000 7000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE 1.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 14 - 20 1 3 (C 13 & 755 44083	Job VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 3000 4000 5000 6000	0# N1091 JACK GAUGE (PSI) 990 1990 2990 4000 5000 6000



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DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	(6138755	MASTER GAUGE (PSI)	
MASTER GAUGE I.D.	<u>(C138755</u>		JACK GAUGE (PSI)
	14.200	1600	980
	44083	2000	1990
	None	3000	2990
-		4000	3990
		5000	4990
		6000	6000
		7000	7000
QC SIGN OFF	W. R. Pollon	2968	9000
Project: TMI NUCLE/	AR PLANT UNIT 1 – 40 th Year	Jok)# N1091
		·······	
	GAUGE CALIBRAT	ION VERIFICATION RECORD	
DATE CHECKED		ION VERIFICATION RECORD	JACK GAUGE (PSI)
DATE CHECKED GAUGE I.D.	10-15-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
	10-15-2013 (C138756	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 99い
GAUGE I.D.	10-15-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
GAUGE I.D. MASTER GAUGE I.D.	10-15-2013 (C138756 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 99い
GAUGE I.D. MASTER GAUGE I.D.	10-15-2013 (C138756 44083	MASTER GAUGE (PSI) (000 2000 3000	JACK GAUGE (PSI) 990 1990 3600
GAUGE I.D. MASTER GAUGE I.D.	10-15-2013 (C138756 44083	MASTER GAUGE (PSI) 	JACK GAUGE (PSI) 990 1990 3000 4000 5000 6000
GAUGE I.D. MASTER GAUGE I.D.	10-15-2013 (C138756 44083	MASTER GAUGE (PSI) (000 2000 3000 4000 5000	JACK GAUGE (PSI) 990 1990 3000 4000 5000



N1091 PSC PROCEDURE QA 10.1 GAUGE CALIBRATION RECORD FORM 09/03/13 Page _____ of ____ Revision 0

	GAUGE CALIBRATIO	ON VERIFICATION RECORD	
DATE CHECKED	10-16-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	((138756	1000	990
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	None	3000	2990
		4000	3990
		5000	3000
		6000	6000
		7000	7000
	W. R. Robb=	දුරුල	7000
OC SIGN OFF			
QC SIGN OFF	AR PLANT UNIT 1 – 40 th Year		o#N1091
Project:TM1 NUCLE/	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI	ON VERIFICATION RECORD	
Project: <u>TMI NUCLE/</u> DATE CHECKED	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATI 10-16-13	ON VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI)
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 CC 158756	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 980
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 980 1980
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 CC 158756	MASTER GAUGE (PSI) / 000 2000 3000	JACK GAUGE (PSI) 980 1980 2980
Project: <u>TMI NUCLE/</u> DATE CHECKED SAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI) / DOD 2000 3000 4000	JACK GAUGE (PSI) 980 1980 2990 3990
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 980 1980 2990 3990 5000
	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 980 1980 2990 3990 5000 6000
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI) (OCO 2000 3000 4000 5000 6000 7000	JACK GAUGE (PSI) 980 1980 2990 3990 5000 6000 7060
Project: <u>TMI NUCLE/</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATI 10-16-13 10-16-13 10-16-13 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000 7000	JACK GAUGE (PSI) 980 1980 2990 3990 5000 6000



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<u> </u>			
DATE CHECKED	10-17-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	<u>cc138755</u>		990
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	Noue	3000	3000
		4000	4000
		5000	5000
		6000	6200
		7000	7000
QC SIGN OFF	W. Pruce Roble	8000	5080
Project: <u>TMI NUCLE</u>	AR PLANT UNIT 1 - 40 th Year	ol	b # <u>N1091</u>
Project: <u>TMI NUCLE</u>		Jo	b # <u>N1091</u>
DATE CHECKED	GAUGE CALIBRA		b # <u>N1091</u> JACK GAUGE (PSI)
DATE CHECKED GAUGE I.D.	GAUGE CALIBRA 10-17-13 CC 138756	TION VERIFICATION RECORD	
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 CC 138756	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 CC 138756	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 480
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 00-138756 44083	MASTER GAUGE (PSI) 	JACK GAUGE (PSI) 480 1 980
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 00-138756 44083	MASTER GAUGE (PSI) (000 2000 3000	JACK GAUGE (PSI) 980 1980 2980
DATE CHECKED	GAUGE CALIBRA 10-17-13 00-138756 44083	MASTER GAUGE (PSI) 	JACK GAUGE (PSI) 480 1980 2980 3990
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 00-138756 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000 7000	JACK GAUGE (PSI) 980 1980 2980 3990 4990 6600 7000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRA 10-17-13 00-138756 44083	MASTER GAUGE (PSI) 	JACK GAUGE (PSI) 480 1980 2980 3990 4990 6600



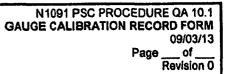
Project: TMI NUCLEAR PLANT UNIT 1 - 40th Year Job # N1091 **GAUGE CALIBRATION VERIFICATION RECORD** 10-18-2013 MASTER GAUGE (PSI) **JACK GAUGE (PSI)** DATE CHECKED GAUGE I.D. CL 138755 1000 1000 MASTER GAUGE I.D. 44083 2000 2000 3000 REMARKS NONC 3000 4000 4000 5000 5000 6000 6000 7010 7000 W. R. Roble-QC SIGN OFF Job # N1091 Project: TMI NUCLEAR PLANT UNIT 1 – 40th Year **GAUGE CALIBRATION VERIFICATION RECORD** DATE CHECKED 10-21-2013 MASTER GAUGE (PSI) JACK GAUGE (PSI) GAUGE I.D. CC 138756 140 1000 MASTER GAUGE I.D. 44083 1980 2000 REMARKS 2980 NONE 3000 3980 4000 4990 5000 6000 6000 7000 7000 W. R. Robbin QC SIGN OFF 45 QA 10.1 TMI.13 ISI



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DATE CHECKED	10-28-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	<u> </u>	1000	490
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	None	3000	3000
		4000	4000
		5000	5000
		6000	6000
		7000	7000
QC SIGN OFF	W.R. Roblest	8000	2000
	AR PLANT UNIT 1 – 40 th Year	Jot	o#N1091
		Job ON VERIFICATION RECORD	o# <u>N1091</u>
	GAUGE CALIBRATI		
Project: <u>TMI NUCLE</u>	GAUGE CALIBRATI	ON VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI)
Project: <u>TMI NUCLE</u> DATE CHECKED	GAUGE CALIBRATI 10-28-2013 66138755	ON VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI)
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990 2990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755 44083	ON VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000	JACK GAUGE (PSI) 990 1990 2990 3990 4990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755 44083	ON VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 9.90 /190 2990 3990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS	GAUGE CALIBRATI 10-28-2013 60138755 44083 MONE	ON VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000	JACK GAUGE (PSI) 990 1990 2990 3990 3990 5990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	GAUGE CALIBRATI 10-28-2013 66138755 44083	ON VERIFICATION RECORD MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000 7000	JACK GAUGE (PSI) 990 1990 2990 3990 3990 5990 7000

PRECISION SUBDELLANCE



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roject: TMI NUCLEA	R PLANT UNIT 1 – 40 th Year	Job	# <u>N1091</u>
•	GAUGE CALIBRATION		
ATE CHECKED	10-29-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
AUGE I.D.	CC 138 756	1000	980
ASTER GAUGE I.D.	44083	2000	1980
EMARKS	None	3000	2990
-		4000	3990
-		5000	4990
-		6000	6000
		7000	7000
	. 1 111	ସତ୍ତନ	୫ ଓଏହ
	W. Pauce Robo	Jot	9 # <u>N1091</u>
	AR PLANT UNIT 1 – 40 th Year	Jot	9 # <u>N1091</u>
roject: <u>TMI NUCLEA</u>	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO	N VERIFICATION RECORD	
roject: <u>TMI NUCLEA</u> ATE CHECKED	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATION 10 - 29 - 2013	N VERIFICATION RECORD	JACK GAUGE (PSI)
roject: <u>TMI NUCLEA</u> ATE CHECKED AUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATION 10 - 29 - 2013 CC 138755	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990
TOJECT: TMI NUCLEA ATE CHECKED AUGE I.D. IASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO 10 - 29 - 2013 <u>CC 138755</u> 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
ATE CHECKED AUGE I.D. IASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATION 10 - 29 - 2013 CC 138755	MASTER GAUGE (PSI) / 000 2000 3000	JACK GAUGE (PSI) 990 1990 3000
ATE CHECKED AUGE I.D. IASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO 10 - 29 - 2013 <u>CC 138755</u> 44083	MASTER GAUGE (PSI) 1000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 3000 4000
ATE CHECKED AUGE I.D. IASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO 10 - 29 - 2013 <u>CC 138755</u> 44083	MASTER GAUGE (PSI) / DOD 2000 3000 4000 5000	JACK GAUGE (PSI) 990 1990 3000 4000 5000
ATE CHECKED	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO 10 - 29 - 2013 <u>CC 138755</u> 44083	MASTER GAUGE (PSI) 1000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 990 1990 3000 4000 5000 6000
ATE CHECKED	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATION 10 - 29 - 2013 CC.138755 44083 Nowe	MASTER GAUGE (PSI) <u>1000</u> <u>2000</u> <u>3000</u> <u>4000</u> <u>5000</u> <u>6000</u> <u>7000</u>	JACK GAUGE (PSI) 990 1990 3000 4000 5000 6000 7000
	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIO 10 - 29 - 2013 <u>CC 138755</u> 44083	MASTER GAUGE (PSI) <u>1000</u> <u>2000</u> <u>3000</u> <u>4000</u> <u>5000</u> <u>6000</u> <u>7000</u>	JACK GAUGE (PSI) 990 1990 3000 4000 5000 6000



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N1091 PSC PROCEDURE QA 10.1 GAUGE CALIBRATION RECORD FORM 09/03/13 Page ____ of ____ Revision 0

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	GAUGE CALIBRATIO	N VERIFICATION RECORD	
DATE CHECKED	11-1-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	(C138755	1000	990
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	None	3000	3000
		4000	4000
	a tha tha an	5000	5000
		6000	6000
		7000	7010
	W.R. Pablan		
QC SIGN OFF	N. F. Coller	-	
	AR PLANT UNIT 1 - 40 th Year	Joi	o # <u>N1091</u>
	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC		p # <u>N1091</u> JACK GAUGE (PSI)
Project: <u>TMi NUCLE</u>	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC	ON VERIFICATION RECORD	
Project: <u>TMI NUCLE</u> DATE CHECKED	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 11 - 4 - 13 CC 138755	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 9%
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 9% (\$90
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000	JACK GAUGE (PSI) 997) 1990 3000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 	MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 997) 1990 3000 4000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRATIC 	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000	JACK GAUGE (PSI) 997) 1990 3000 4000 5000



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	R PLANT UNIT 1 - 40 th Year	Job	# <u>N1091</u>
······································	GAUGE CALIBRATI		
DATE CHECKED	11-5-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	CC 138755	1000	1000
MASTER GAUGE I.D.	44083	2000	2000
EMARKS	None	3000	3060
		4000	4000
		5000	5000
		6000	6000
		7000	7000
QC SIGN OFF	W.R. Polot		
	GAUGE CALIBRAT	ION VERIFICATION RECORD	
	11-7-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	11-7-2013 (C138755	MASTER GAUGE (PSI)	990
GAUGE I.D. MASTER GAUGE I.D.	<u>11-7-2013</u> <u>CC138755</u> 44083	MASTER GAUGE (PSI)	990 1990
GAUGE I.D. MASTER GAUGE I.D.	11-7-2013 (C138755	MASTER GAUGE (PSI) (000 2000 3000	990 1990 2990
GAUGE I.D. MASTER GAUGE I.D.	<u>11-7-2013</u> <u>CC138755</u> 44083	MASTER GAUGE (PSI) (000 2000 3000 4000	990 1990 2990 4000
GAUGE I.D. MASTER GAUGE I.D.	<u>11-7-2013</u> <u>CC138755</u> 44083	MASTER GAUGE (PSI) 	990 1990 2990 4000 5000
GAUGE I.D. MASTER GAUGE I.D.	<u>11-7-2013</u> <u>CC138755</u> 44083	MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000	990 1990 2990 4000 5000 6000
GAUGE I.D. MASTER GAUGE I.D.	11-7-2013 <u>CC138755</u> 44083 Noul	MASTER GAUGE (PSI) 	990 1990 2990 4000 5000
DATE CHECKED GAUGE I.D. MASTER GAUGE I.D. REMARKS QC SIGN OFF	<u>11-7-2013</u> <u>CC138755</u> 44083	MASTER GAUGE (PSI) (000 2000 3000 4000 5000 6000	990 1990 2990 4000 5000 6000



	GAUGE CALIBRATION	N VERIFICATION RECORD	<u></u>
DATE CHECKED	11.14.13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	<u>CC138755</u>	1600	990
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	None	3000	2990
		4000	3990
		5000	5000
		6000	6000
		7000	7000
	0 111		
QC SIGN OFF	W. E. Pollen		
	AR PLANT UNIT 1 – 40 th Year	Joi	b#N1091
Project: TMI NUCLE	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC	DN VERIFICATION RECORD	
Project: <u>TMI NUCLE</u> DATE CHECKED	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC	DN VERIFICATION RECORD	JACK GAUGE (PSI
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15-13</u> CC1387195	MASTER GAUGE (PSI)	JACK GAUGE (PSI 990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> - \$ ا 3</u> <u>(1387195</u> 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15-13</u> CC1387195	MASTER GAUGE (PSI) (000 2000 3000	JACK GAUGE (PSI) 490 1990 2990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15.13</u> <u>CC1387195</u> 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 2990 3990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15.13</u> <u>CC1387195</u> 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000	JACK GAUGE (PSI 990 1990 2990 3990 400
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15.13</u> <u>CC1387195</u> 44083	MASTER GAUGE (PSI) 1000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 490 1990 2990 3990 5000 6000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRATIC <u> -15.13</u> <u>CC1387195</u> 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000 5000	JACK GAUGE (PSI 990 1990 2990 3990 400



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		ION VERIFICATION RECORD	
	GAUGE CALIBRAT	ION VERIFICATION RECORD	
DATE CHECKED	11-18-13	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	CC138755	1000	990
MASTER GAUGE I.D.	44083	2000	2000
EMARKS	Non	3000	3000
		4000	4000
		5000	5000
		6000	6000
		7000	7800
·	W.E. Public		o #N1091
	AR PLANT UNIT 1 – 40 th Year	Jot	o #N1091
Project: <u>TMI NUCLE</u>	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA	TION VERIFICATION RECORD	
	AR PLANT UNIT 1 - 40 th Year GAUGE CALIBRA 1/- 1名-1ろ	TION VERIFICATION RECORD MASTER GAUGE (PSI)	JACK GAUGE (PSI)
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 CL 138755	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 9 90
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 16-138755 44083	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1940
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 CL 138755	MASTER GAUGE (PSI)	JACK GAUGE (PSI) 990 1980 2980
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 16-138755 44083	TION VERIFICATION RECORD MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 2980 3980 3980
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 16-138755 44083	MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 2980 3980 3980 4990
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 16-138755 44083	TION VERIFICATION RECORD MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 990 1980 2980 3980 3980 4990 6000
Project: <u>TMI NUCLE</u> DATE CHECKED GAUGE I.D. MASTER GAUGE I.D.	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 12-138755 44083 NoNC	MASTER GAUGE (PSI) / 000 2000 3000 4000	JACK GAUGE (PSI) 990 1990 2980 3980 3980 4990
Project: <u>TMI NUCLE</u>	AR PLANT UNIT 1 – 40 th Year GAUGE CALIBRA 11-18-13 16-138755 44083	TION VERIFICATION RECORD MASTER GAUGE (PSI) / 000 2000 3000 4000 5000 6000	JACK GAUGE (PSI) 990 1980 2980 3980 3980 4990 6000



	GAUGE CALIBRATIO	N VERIFICATION RECORD	
DATE CHECKED	11-20-2013	MASTER GAUGE (PSI)	JACK GAUGE (PSI)
GAUGE I.D.	CC138755	1000	990
MASTER GAUGE I.D.	44083	2000	1990
REMARKS	NONC	3000	3000
	•	4000	4000
		5000	5000
		6000	6000
		7000	7000
QC SIGN OFF	W. R. Pellan		
Project: TMI NUCLE	AR PLANT UNIT 1 – 40 th Year	ot	b#N1091

GAUGE CALIBRATION VERIFICATION RECORD 11-20-2013 DATE CHECKED MASTER GAUGE (PSI) JACK GAUGE (PSI) LC138756 GAUGE I.D. 990 1000 MASTER GAUGE I.D. 44083 1990 2000 REMARKS NONC 3000 2890 3990 4000 5000 51000 6000 6000 7000 7000 W. R. Poble QC SIGN OFF

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N1091 PSC PROCEDURE QA 9.0 NONCONFORMANCES NONCONFORMANCE REPORT INDEX LOG 09/03/13 Revision 0 Page ____ of ____

	NONCONFORMANCE REP	ORT INDEX L	OG		
NCR#	DESCRIPTION	DATE WRITTEN	DATE SUBMITTED	DATE APPROVED	DATE COMPLETE
NCR- 11091-001	2 Protructing wires found on tendent	9-27-13	9-27-13		
NCR-	H 24-15 Buttress 4 Shop end. 1 Additional Missing wire At the Galkry/Field End of V-136	10.2-13	10-2-13		
NCR V1091-003	Locked off V.136 At 1414 Kips,	10-8-13	10-8-13		
NCR 1/091-004	D143 SOUTH SHOPEND	109-13	10-9-13		
NCR V 1041-005	Excessive ohim gap at buttless 1 of tendous H13-078	B-31-13			
NCR N 1091-006	Over 10% ON grease refill of tendon D-143.	11-13-13	11-13-13		
NCL N1091-007	Over 10% on grease letill of tenden D-146	11-13-13	11-14-13		
NCR 1091-008	Over 10% ON GIEASE refill of tendon D-237	11-14-13	11.14-13		
••••••••••••••••••••••••••••••••••••••					
					
			1		

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PRECISION SUPPLE	TANCE		Revis	ICES ORM 03/13 ion 0
(Sector	مەردىمەر مەرمەر ئىكى ئەركىيە ئىكى ئەركىيە ئىكى ئەركىيە ئىكى ئەركىيە ئىكى ئەركىيە ئىكى ئەركىيە ئەركىيە ئەركىيە ئەركىيە ئەركىيە	Ċ₩±₩₩₽₩₩₩₽₩₩₽₩₩₽₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩	Pagə of	
<u>nan yan ku </u>	NONCONFORMANCE / CO	RRECTIVE ACTION REP	PORT FORM	
HOLD TAG NO .:	N/A	NC / CA M	NO.: <u>NCR-N1091-001</u>	
NONCONFORMANCE: Vires that have a the client shall by tendon # H24	Per PSC proceedures lot been previously de be notified by A 4-15 butt. 4 shop end. 1	198.0 sec. 13.5 ocumented are NCR. Two p Both wires are p	When for more protrudi detected during inspects notruding wires were to notruding Approx 0.25"	NS ON, XINC
APPARENT CAUSE KNO		IF YES, DESC	۱۹۸۸ «۱۹۹۳» می بواند و دارند کرد کرد بو دور دینی می دون در می می دون در می می دون در است . است . می و می دود کرد کرد بو	
RECOMMENDED CORRE	ECTIVE ACTION: Client	to determine	h	
ANY NONCONFORMING	ITEM TO BE REPAIRED SHALL	HAVE AN APPROVED RI Lient to determ	EPAIR PROCEDURE.	
ANY NONCONFORMING	ITEM TO BE REPAIRED SHALL	AVE AN APPROVED RE	EPAIR PROCEDURE.	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE	TIEM TO BE REPAIRED SHALL	TITLE	EPAIR PROCEDURE.	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE:	TIEM TO BE REPAIRED SHALL	LAVE AN APPROVED RI Lienst to determ TITLE LNO IF YES	EPAIR PROCEDURE. ALUC . DATE: S, REFER TO QAM SECTION 15.	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL	ITEM TO BE REPAIRED SHALL I O PREVENT RECURRENCE: C DITION: YES 3	HAVE AN APPROVED RE Liewt to deterw TITLE LNO IF YES	EPAIR PROCEDURE. ALUC . DATE: S, REFER TO QAM SECTION 15.	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED	ITEM TO BE REPAIRED SHALL I O PREVENT RECURRENCE: C DITION: YES 3 3: QC Utallouty 9-27-13	HAVE AN APPROVED RE Liewt to deterw TITLE LNO IF YES	EPAIR PROCEDURE. ALWE, DATE: S, REFER TO QAM SECTION 15. ENGINEERING 2 9/30/13 ALWOWL	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL	ITEM TO BE REPAIRED SHALL I O PREVENT RECURRENCE: O PREVENT RECURRENCE: O TION: YES YES	HAVE AN APPROVED RE Liewt to deterw TITLE LNO IF YES	EPAIR PROCEDURE. ALAIC . DATE: S, REFER TO QAM SECTION 15. ENGINEERRING 2 9/30/13 HERDINEERRING DATE	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED	ITEM TO BE REPAIRED SHALL I O PREVENT RECURRENCE: O PREVENT RECURRENCE: O TION: YES YES	HAVE AN APPROVED RE Liewt to deterw TITLE LNO IF YES	EPAIR PROCEDURE. ALAIR PROCEDURE. DATE: DATE: S, REFER TO QAM SECTION 15. ENGINEERING L 1/30 /13 ENGINEERING DATE DATE DATE	
ANY NONCONFORMING CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED	ITEM TO BE REPAIRED SHALL I O PREVENT RECURRENCE: C DITION: I YES S: QC Uttlebutty Q-27-1: S: NO ENGINEER QA	AVE AN APPROVED RI Lient to determ TITLE LNO IF YES QA ABusson UENDOR	EPAIR PROCEDURE. ALAIC . DATE: S, REFER TO QAM SECTION 15. ENGINEERRING 2 9/30/13 HERDINEERRING DATE	
CORRECTIVE ACTION T INITIATOR: SIGNIFICANT CONE APPROVAL COMMENTS PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED X YE COMMENTS:	DITION: YES YES QC Uthelewith 9-27-13 S NO ENGINEER QA DISTRIBUTION	HAVE AN APPROVED RI Lient to determ TITLE LNO IF YES 3 ABusson	EPAIR PROCEDURE. ALAR PROCEDURE. ALAR DATE: DATE: S, REFER TO QAM SECTION 15. ENGINEERRING L 9/35 /13 ENGINEERRING DATE DATE DATE DATE DATE	

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(2) / 9.0 & 10. 9.2) But 9.2) Anc (9.2) But (9.2) But (9	As-Found Post De-Ter <u>0 - CORROSION & CRACK INSPEC</u> tonheads Level: Ar chorhead Level: A shing Level: A	Tendon End: ANCHORAGE Instanting / Pre-Wir CTION (1) (1) (1) (1) (1) (1)	INSPEC e Remova (10.1) (10.1) (10.1) (10.1) (10.1) etch of the c	TION CI Gracks Cracks Cracks Cracks Cracks Cracks cracks on S	 Post Re Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ 	-Tensioning XI No XI No XI No IXI No IXI No 8.0 and initiats	INVA NVA NVA NVA NVA	
(2) / 9.0 & 10. 9.2) But 9.2) Anc (9.2) But (9.2) But (9	As-Found Post De-Ter <u>0 - CORROSION & CRACK INSPEC</u> tonheads Level: At chorhead Level: A shing Level: A aring Plate Level: A 1^{11} - Corrosion Level of C requires a NCR. UTTONHEAD INSPECTION Offsize (Malformed) Protruding/unseated	ANCHORAGE nsioning / Pre-Wir CTION (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	INSPEC e Remova (10.1) (10.1) (10.1) (10.1) (10.1) etch of the c	TION CI Gracks Cracks Cracks Cracks Cracks Cracks cracks on S	 Post Re Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ Yes⁽²⁾ 	X] No X] No X] No X] No X] No		Q.C. Signofi
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(12.2) Number of Protruding Buttonheads (-): (12.3) Number of Missing Buttonheads (Ø, Ø): (12.4) Total of Protruding + Missing Buttonheads: (12.5) Total # of Effective Buttonheads Seated: (12.5) Total # of Effective Buttonheads Seated: (12.7) Overall Results Acceptable (12.7) Overall Results Acceptable (12.6) Continuity Test Requested? (12.6) Continuity Test Requested? (12.7) Continuity Test Requested? (12.6) Continuity Test Requested? (12.7) Continuity Test Requested? (12.6) Continuity Test Requested? (12.6) Continuity Test Requested? (12.6) Continuity Test Requested? (12.6) Continuity Test Requested? (12.7) Continuity Test Requested	PRECIBION BURNENCLANCE		PSC PROCEDURE SQ 8.0 NCHORAGE INSPECTION Data Sheet 8.0A 09/03/13 Page 1 of 1 Revision 0
ANCHORAGE INSPECTION CRITERIA Q As-Found Post De-Tensioning / Pre-Wire Removal Post Re-Tensioning Q.C. Signed 80.6 10.0 - CORROSION & CRACK INSPECTION (10.1) Cracks Yes ¹⁴ \square NN \square NNA 9(2) Buitonheads Level: \square (10.1) Cracks Yes ¹⁴ \square NN \square NNA (9.2) Shims Level: \square (10.1) Cracks Yes ¹⁴ \square NN \square NNA (9.2) Bearing Plate Level: \square (10.1) Cracks Yes ¹⁴ \square NN \square NNA (9.2) Bearing Plate Level: \square (10.1) Cracks Yes ¹⁴ \square NN \square NNA (9.2) Bearing United as missing \square Offsize (Malformed)		******	SUNIT 1
Example As-Found Post De-Tensioning / Pre-Wire Removal Post Re-Tensioning Q.C. Sign 20.6 10.0 - CORROSION & CRACK INSPECTION (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Buitonheads Level: $A^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Bearing Plate Level: $B^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Bearing Plate Level: $B^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Buins Level: $B^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Bearing Plate Level: $B^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (9.2) Buins Interation $B^{(1)}$ (10.1) Cracks Yes ¹⁰ ØN O N/A (10.2) Crackal on Statch Interackal on Statch $B^{(1)}$ $B^{(2)}$ $B^{$			X Field
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110-BUTTONHEAD INSPECTION Image: Constraint of the second distribution of the second distribution of the second distribution for the second distreter distribution fore the second distreter	9.0 & 10.0 - CORROSION & CRACK INSPECTION 9.2) Buttonheads Level: 9.2) Anchorhead Level: (9.2) Anchorhead Level: (9.2) Shims Level: (9.2) Bearing Plate Level:	(10.1) Cracks [] Yes ⁽²⁾ [2] No [(10.1) Cracks [] Yes ⁽²⁾ [2] No [(10.1) Cracks [] Yes ⁽²⁾ [2] No [(10.1) Cracks [] Yes ⁽²⁾ [2] No [] N/A] N/A] N/A] N/A] N/A] N/A] N/A
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OC Reviewed: Date:	(12.3) Number of Missing Buttonheads (Ø, Ø): (12.4) Total of Protruding + Missing Buttonheads: (12.5) Total # of Effective Buttonheads Seated:	(12.6) Continuity Test Requested?] Yes [] No] Yes [] No [<i>Cent</i> W
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Project: TMI 40 TH YEAR TENDON SURVEILLANCE SI Unit 1	
(7.8)Tendon No.: <u>V-136</u> Tendon End: <u>Top</u> ØShop] Field
LIFT-OFF INSPECTION CRITERIA	Q.C. Signoff
(9.3) Temp. of Concrete: <u>94</u> °F Thermometer No.: <u>ST-102</u> Recal Date: <u>/0.29-13</u> Ambient Temp.: <u>80</u> °F Thermometer No.: <u>PK104</u> Recal Date: <u>10.29-13</u> (9.4) Anchorhead and Stressing Adapter Threads : X Acceptable Unacceptable (9.5) Number of Effective Wires: <u>168</u>	0 <i>FR 10-2-1</i> 3
(9.6) Anchorhead and Stressing Adapter Engagement/Alignment : X Acceptable Unacceptable	WRE10-2-13
(9.7) RAM ID: <u>9400</u> Recal Date: end of job RAM Area: <u>231.947</u> K = <u>-0.269</u> Gauge ID: <u>((138755)</u> Recal Date: <u>Daily on usc</u> Daily Check: <u>OK</u>	AJRE ID-213
(9.8) Shim Stack Height: #1 15 in. #2 15 in. Ruler ID: R:94 Recal Date: 11-9-13 Individual Shims: Stack #1: 4,4,4,1/2,1/4,2 in. Stack #2: 4,4,4,1/2,1/4,2 in. (9.9) Lift-off Overstress Force (LOSF): 1592 kips Pressure: 6867.76 pst	0.KL 10-2-13
(9.10) PF: 1306 kips 95% PF: 1241 kips 90% PF: 1175 kips 5634.19 psi 5359.83 psi 5069.16 psi (9.11.5) As-Found Lift-Off (9.11.13) Circled Values	WR 10-2-13
Stack #1: 1) 5750 psi 2) 5750 psi 3) 5750 psi (9.11.13) End Average Force (this end): $/355/7$ kips (9.11.14) End Avg. Force (other end): $/355/7$ kips (9.11.16) Liftoff (ALV) Acceptance Criteria: a) \boxed{X} Acceptable – ALV is $\ge 95\%$ PF.	4 <i>182-1</i> 3
 b) ☐ Adjacent Tendons to be stressed - ALV is < 95%PF but ≥ 90%PF. Document on a NCR. c) ☐ Unacceptable - ALV is < 90%PF. Document on a NCR. NCR Required ☐ Yes ☑ No Customer Notified NCR No.:	WLR 10-2-13
(9.11.17) Adjacent Tendon Lift-Offs (Nots: Use a separate Date Sheet 9.0 to document Liftoff forces.) (a) { Adj Tendon: Adj Tendon: Acceptable – ALV > 95% of PF, The original scope tendon SHALL be restored to within –0/+6% of PF, but in no case, no greater than 0.70 GUTS as determined for the number of effective wires. Adj Tendon: EXELON Notified: Yes No	WEL102-13_
b) { Adj Tendon: Unacceptable – ALV < 95% of PF for either tendon. Document the condition on a NCR. Customer Notified NCR No.: Adj	<i>will</i> 10-2-13
c) - Adj Tendon: [] Unacceptable - ALV < 90% of PF for either tendon. Document the condition on a NCR Customer Notified NCR No.: N/A	uKR10-2-13
QC Reviewed: Date: Date:	
21.5	Q 9.0 TMI.13 ISIa

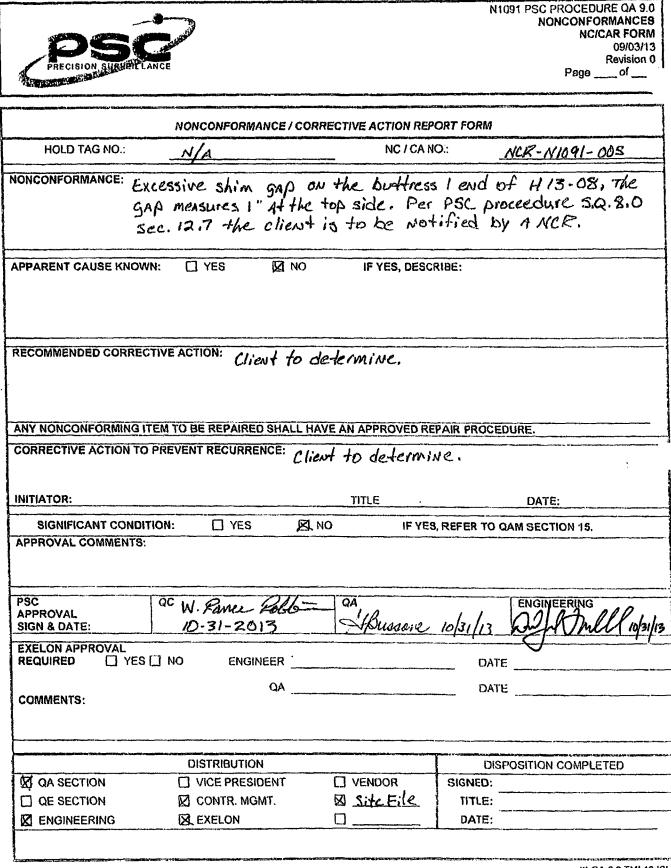
Project: TMI 40 TH YEAR TENDON SURVEILLANCE Image: Constraint of the second seco	NDONS
(9.3) Tendon No.: V-/36 Tendon End: Top Ishop Field (9.4) Temp. of Concrete: 8/ °F Thermometer No.: ST /DZ Recal Date: /0.29-/3 Ambient Temp.: 85 °F Thermometer No.: PK - 104+ Recal Date: /0.29-/3 (9.5) Anchorhead and Stressing Adapter Threads: Ist Acceptable Unacceptable RETENSIONING DOCUMENTATION (9.6) Number of Effective Wires: 167 (from Data Sht. 8.0) From gallery end. (9.7) Anchorhead and Stressing Adapter Engagement/Alignment : Ist Acceptable Unacceptable	ignoffs
(9.4) Temp. of Concrete: g/ °F Thermometer No.: ST DZ Recal Date: 10.29-13 Ambient Temp.: g5 °F Thermometer No.: PK - 104 Recal Date: 10.29-13 (9.5) Anchorhead and Stressing Adapter Threads: M Acceptable Unacceptable RETENSIONING DOCUMENTATION (9.6) Number of Effective Wires: 167 (from Data Sht. 8.0) Fedata sheet SQ 8.0 (9.7) Anchorhead and Stressing Adapter Engagement/Alignment : IX Acceptable Unacceptable	ignoffs
Ambient Temp.: 85 °F Thermometer No.: PK - 104 Recal Date: 10.29-13 (9.5) Anchorhead and Stressing Adapter Threads: Acceptable Unacceptable RETENSIONING DOCUMENTATION QC Si (9.6) Number of Effective Wires: 167 (from Data Sht. 8.0) Fedate sheet SQ 8.0 (9.7) Anchorhead and Stressing Adapter Engagement/Alignment : IX Acceptable Unacceptable	ignoffs
(9.5) Anchorhead and Stressing Adapter Threads: Acceptable Unacceptable RETENSIONING DOCUMENTATION QC Stressing Adapter SQ 8,0 (9.6) Number of Effective Wires: 167 (from Data Sht. 8.0) from gallery ead. (9.7) Anchorhead and Stressing Adapter Engagement/Alignment : IX Acceptable	ignoffs
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(9.6) Number of Effective Wires: 167 (from Data Sht. 8.0) From gallery end. (9.7) Anchorhead and Stressing Adapter Engagement/Alignment : 🕅 Acceptable 🗍 Unacceptable	ignoffs
(9.7) Anchorhead and Stressing Adapter Engagement/Alignment : 🔯 Acceptable 🗍 Unacceptable	
Gauge ID: (138755 Recal Date: Daily on USE Daily Check: OF	<u>0-2-1</u>
Step 2 = 1200 kips Pressure: $5176,99$ psi Elongation: 8.05 in. LOF = 1335.17 kips Pressure: 5760.00 psi OSF = 1568 kips Pressure: 6724.24 psi Elongation: 11 in. URP 1 WRR 10-2-13	<u>10-2-(</u>
$P = (F - K) \times 1000$ $A = Ram Area (in2)$ $P = Gauge Pressure (psi)$ $K = Constant factor (kips)$ $(CAUTION: "K" constants can be either positive or negative.)$	
NOTE: We removed 1 set of 1/4" shims and added 1 set of 1/8" shims At the top end. We added 1 set of 1" shims at the bottom/gallery end. HT#S 1/8"-RI6ST URE 1/2 1"-9F702F	
QC Reviewed: Level: Date:	

	DURE SQ 11.0 ION TENDONS SHEET SQ 11.0 09/03/13 Page 2 of 2 Revision ~
Project: TMI 40 TH YEAR TENDON SURVEILLANCE	2
(9.3)Tendon X-134 Tendon End: Xop Field	
Actual Observed Force and Elongation Measurements using formula below	QC Signoffs
(9.9.4.1) PTF = 196,80 klps Pressure: 850 psl @ Elongation: 395in.	
(9.9.5.1) Step 1 799.60 kips Pressure: 3450 psi Elongation: 9,2in.	
(9.9.6.1) Step 2 1200.70 kips Pressure: 5180 psi Elongation: 12.8 in.	
(9.9.7.1) OSF = 1567.02 kips Pressure: 6760 psi @ Elongation: 16.Din.	IRR 10-2-13
(9.9.8) $Q - Q_{m}$ (2, 05 in. Elongation Value (this end)	
(9.9.9) N/A in. Elongation Value (opposite end)	
(9.9.10) 12.05 in. TOTAL Tendon Elongation Value	
(9.9.12.1) Elongation 9.54% Ruler ID: R-94 Recal Date: 1/-9-13	
(9.9.12.3) Elongation Results Customer Notified NCR No: N/k	
Options Original Lift-off Values from Data Sheet SQ 9.0 A Lift-off < Predicted Force	
A Lift-off < Predicted Force	
C Lift-off > 67% GUTS Use 70% + 0 - 3% GUTS (effective wires)	
D Lift-off > 70% GUTS Use 70% + 0 - 3% GUTS (effective wires) (0.10 5) LOS Accessible Second Min	
(9.10.5) LOF Acceptable Range Min Max As found lift-off/or predicted (highest): (335,17 kips /4/5,28 kips	
	NRR 10.2.13
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
(9.10.8) Force (this end): 1414.00 kips Actual Average: 6100 psi	
(9.10.9) Force (opposite end): N/A kips (9.10.10) Tendon ALV Force 1414 kips (9.10.11) ALV Acceptable: X/A loss loss of the customer Notified NCR No.: N/A	
(9.10.15) Additional broken/missing wires: ZNO Yes Amount:	
(9.10.16) Additional Protruding/Unseated wires: XNo Yes Amount:	
9 F 702 F If Yes - Customer Notified NCR No.: N/A	WRE 10.2-13
QC Reviewed: Date: Date:	

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PRECISION SURVEY	C.ANCE	111-1 1112 The sector sector of the sector		SC PROCEDURE QA 9. NONCONFORMANCE NC/CAR FOR 09/03/1 Revision Page of
	NONCONFORMANCE / CO	RRECTIVE ACTION REPO	DRT FORM	
HOLD TAG NO .:	<u>/A</u>		D.: <u>NCR</u>	- N1091-004
IONCONFORMANCE: E DF TENDON D-11 ON TOP SIDE C TELON ENCEINEE	EXCESSIVE SHIM GA 43 SOUTH/SHOP END OF SHIM STHCK. PER FRINGS SHALL BE NOT	P FOUND AT F SHIM GAP ME PSC PROCEDUR IFIED BY A NO	ts Found Houred 1 in Le SQ 0.0 S C-R.	INSPECTION UCH WIDE SEC. 12.7
POSSIBLY CE	DWN: DYES Ø, NO NTERHOLE DF SHIM THE WIRE BUNDLE	IF YES, DESCR 15 15 TOO SMIA	IBE: LL, SHIMS	APPETER TO
				······································
	ECTIVE ACTION: (LIENT TO SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE:	DETERMINE	AIR PROCEDURE	
ANY NONCONFORMING CORRECTIVE ACTION	CLIENT TO SITEM TO BE REPAIRED SHALL F	IAVE AN APPROVED REP		DATE:
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON	CLIENT TO SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION:	IAVE AN APPROVED REF	REFER TO QAM S	DATE: SECTION 15.
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON	CLIENT TO SITEM TO BE REPAIRED SHALL F	IAVE AN APPROVED REF	REFER TO QAM S	DATE: SECTION 15.
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON	CLIENT TO SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION: [] YES [2] S: AS FOUND GAP U 1, CLOSED AS MUCH AS	TITLE NO IF YES, JAS 1." WIDE, POSSIBLE,	REFER TO QAM S IAS LEVDT	DATE: SECTION 15.
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON APPROVAL COMMENT .2.5 "AT BOTICY PSC APPROVAL SIGN & DATE: EXELON APPROVAL	CLIENT TO SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION: [] YES [2] S: AS FOUND GAP UN 1, CLOSED AS MUCH AS QC CUTE LOW A 10-9-1	TITLE NO IF YES, JAS 1." WIDE, POSSIBLE,	EFER TO QAM S 145 C-ETD) 10/4/13	DATE: SECTION 15. WAS 5" AT 10
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON APPROVAL COMMENT .2.5 "AT BOTICY PSC APPROVAL SIGN & DATE: EXELON APPROVAL	QLIENT To SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION: I YES S: AS FOUND GAP N, CLOSED AS MUCH AS QC QC<	TITLE NO IFYES, JAS I." WIDE, POSSIBLE, QA 3 HBUSSORE	EREFER TO QAM S 145 C-ETD) 10/4/13 EN 10/4/13 QATE	DATE: SECTION 15. WAS .5" AT TO
ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT CON APPROVAL COMMENT .2.5 "AT BOTICY PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED [] YE	QLIENT To SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION: I YES S: AS FOUND GAP N, CLOSED AS MUCH AS QC QC<	TITLE NO IF YES, JAS I. " WIDE, POSSIBLE, QA 3 ABUDGENE	REFER TO QAM S 145 CEVET 10/4/13 EN DATE DATE	DATE: SECTION 15. WAS 5" AT TO
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ANY NONCONFORMING CORRECTIVE ACTION INITIATOR: SIGNIFICANT COM APPROVAL COMMENT .2.5 "A1 & OTTCAV PSC APPROVAL SIGN & DATE: EXELON APPROVAL REQUIRED UYE COMMENTS:	QLIENT To SITEM TO BE REPAIRED SHALL F TO PREVENT RECURRENCE: DITION: YES S: AS FOUND GAP N, CLOSED AS MUCH AS QC QLENT (OUT A 10-9-1) ES NO ENGINEER QA	IAVE AN APPROVED REF TITLE NO IF YES, JAS 1." WIDE, POSSIBLE, QA 3 ABUSSONE	REFER TO QAM S 145 CEDT 10/4/13 DATE DATE DISPOSIT	DATE: SECTION 15. WAS 5" AT TO

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9.0 & 10.0 - CORROSION & CRACK INSPECTION (9.2) Buttonheads Level: $A^{(1)}$ (10.1) Cracks Yes ⁽¹⁾ Mo N/A (9.2) Bushing Level: $A^{(1)}$ (10.1) Cracks Yes ⁽¹⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽¹⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (9.2) Shims Level: $A^{(1)}$ (10.1) Cracks Yes ⁽²⁾ Mo N/A (10 Grassion Lavel of Crauting Shims Shims Coordination Shims <th></th> <th>PRECISION SURVER</th> <th>LANCE</th> <th></th> <th>nin minin kana kana di kana kana kana kana kana kana kana kan</th> <th>n na cantaka sa 12 milangan sa 19 mi Ing na cantaka sa 19 milangan sa 19 m</th> <th>N105</th> <th>ANCHORAGE</th> <th>EDURE SQ 8.0 E INSPECTION ata Sheet 8.0B 09/03/13 Page 1 of 1 Revision C</th>		PRECISION SURVER	LANCE		nin minin kana kana di kana kana kana kana kana kana kana kan	n na cantaka sa 12 milangan sa 19 mi Ing na cantaka sa 19 milangan sa 19 m	N105	ANCHORAGE	EDURE SQ 8.0 E INSPECTION ata Sheet 8.0B 09/03/13 Page 1 of 1 Revision C
ANCHORAGE INSPECTION CRITERIA Image: Anchor And American Structure Post De-Tensioning / Pre-Wire Removal Post Re-Tensioning Q.C. Signo 9.0 & 10.0 - CORROSION & CRACK INSPECTION (10.1) Cracks Yes (1) Image: No N/A (9.2) Buttonheads Level: A (1) (10.1) Cracks Yes (1) Image: No N/A (9.2) Bushing Level: A (1) (10.1) Cracks Yes (1) Image: No N/A (9.2) Shims Level: A (1) (10.1) Cracks Yes (1) Image: No N/A (9.2) Shims Level: A (1) (10.1) Cracks Yes (1) Image: No N/A (9.2) Bearing Plate Level: A (1) (10.1) Cracks Yes (1) Image: No N/A (10. BUTTONHEAD INSPECTION (10.2) Cracks Yes (1) Image: No Image: No N/A (11.0 - BUTTONHEAD INSPECTION GAP Sex ACGPH - N IOPI - 005 Sex ACGPH	Projec	ct: TMI 2013	TENDON SURVE	EILLANCE	210000000 00000000000000000000000000000	a-Gunnan ini sadara su kunununa	Ŋĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸ	NUNI	Т 1
Image: State of the second state o	(7.3)Te	endon No.: <u>H</u>	13-08	Tendon End:	Buttress	<u> </u>		X Sho	φ
3.0 & 10.0 - CORROSION & CRACK INSPECTION (9.2) Buttonheads Level: (1) (10.1) Cracks Yes ⁽¹⁾ (No N/A (9.2) Bushing Level: (1) (10.1) Cracks Yes ⁽¹⁾ No N/A (9.2) Bushing Level: (1) (10.1) Cracks Yes ⁽¹⁾ No N/A (9.2) Bushing Level: (1) (10.1) Cracks Yes ⁽¹⁾ No N/A (9.2) Shims Level: (1) (10.1) Cracks Yes ⁽¹⁾ Ø No N/A (9.2) Staing Plate Level: (1) (10.1) Cracks Yes ⁽¹⁾ Ø No N/A (9.2) Bearing Plate Level: (1) (10.1) Cracks Yes ⁽¹⁾ Ø No N/A (10 BUTTONHEAD INSPECTION (10.1) Cracks Yes ⁽¹⁾ Ø No N/A (10 Burtoninicads (10.1) Cracks Yes ⁽¹⁾ Ø No N/A (11.0 - BUTONHEAD INSPECTION CARCASINC CARCASINC Sketch Ske		an a		ANCHORAGE	INSPECTION C	RITERIA			
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(9.2) Ar	nchorhead	Level: A		(10.1) Cracks	[] Yes ⁽²⁾	🗹 No	🗌 N/A	
$ \begin{array}{c} (0.1) Cracks \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	(9.2) Bu	ushing	Level: A		(10.1) Cracks		ØŅo	[] N/A	
$ \begin{array}{c} (0.1) Cracks \Box 193 \\ ($	• •		24-		-	-	12 No	N/A	
11.0 - BUTTONHEAD INSPECTION Excessive. Shim, Image: Constraint of the state of	(9.2) Be				(10.1) Cracks	🗌 Yes ⁽²⁾	10 No	🗌 N/A	WPR 10-31-13
Image: Offsize (Malformed)GAP See NUR See NUR Wire/buttonheadsImage: Protructing/unseated wire/buttonheadsSee Sketch See Sketch Sheet See Sketch Sheet SurveillanceImage: Previously identified as missingImage: Offsize Offsize Offsize (Malformation Surveillance for testing Located on Sketch:Image: Image: Image: Offsize of Protructing Buttonheads Found: Image: Image: Image: Image: Offsize of Protructing Buttonheads (w):Image: Image:				. (4) - Compose a sk	etch of the cracks on	Sketch Sheet			
Protruding/unseated wire/buttonheads-N 1091-005 See sketch sheetØBroken/missing wire/buttonheadsØPreviously identified as missingØDiscontinuous - removed this surveillance or testingØDiscontinuous - removed this surveillance for testing(11.2) Anchorhead I.D.107% Located on Sketch:Located on Sketch:Ø YesNoBushing I.D.9 YesNo (11.4) Missing Buttonheads Found: $\Box Yes$ 11.2) Number of Protruding Buttonheads (w):0(12.2) Number of Protruding Buttonheads (w):0(12.2) Number of Protruding Buttonheads (w):0	<u>11.0 - E</u>	SUTTONHEAD INS	SPECTION	1					
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Previously identified as missingDiscontinuous - removed this surveillancesurveillancesurveillancesurveillancesurveillance for testing(11.2) Anchorhead I.D.Located on Sketch:Located on Sketch:Located on Sketch:The surveillanceSurveillance	ø	Broken/missing w	ire/buttonheads		and the second s	1018-		Sheer	
Discontinuous - removed this surveillanco \bigcirc Wire(s) being removed during this surveillance for testing \bigcirc (11.2) Anchorhead I.D. 107% Located on Sketch: \bigcirc Located on Sketch: \bigcirc \bigcirc Bushing I.D. 59% Located on Sketch: \bigcirc Located on Sketch: \bigcirc \bigcirc YesNo(11.4) Missing Buttonheads Found: \bigcirc \bigcirc Yes $(4, 2, \frac{1}{2})$ \bigcirc (12.2) Number of Protruding Buttonheads (\checkmark): \bigcirc (12.2) Number of Protruding Buttonheads (\checkmark): \bigcirc (12.2) Number of Protruding Buttonheads (\checkmark): \bigcirc (12.2) Number of Protruding Buttonheads (\checkmark): \bigcirc (12.2) Number of Protruding Buttonheads (\checkmark): \bigcirc					- Z 600	000000			
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Surveillance for testing(11.2) Anchorhead I.D. 107% Located on Sketch: 107% 11.4) Missing Buttonheads Found: $1000000000000000000000000000000000000$		and the second se	no and design these	4 /	1000000				
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Bushing I.D. 598 Located on Sketch:	(· · ·		T	-	1000000			ļ	
Located on Sketch: \bigcirc Yes \bigcirc No (11.4) Missing Buttonheads Found: \bigcirc Yes \bigcirc No Quantity: Additional Information: Shine stack htt - 6.6 $(4, 2, \frac{12}{2})$ (12.2) Number of Protruding Buttonheads (\forall): \bigcirc (8.3) Illumination source $ce^{f}cc-11$ - O_{4} /8 W_{A} Flashight	Į –		-			0000	5007	1	
(11.4) Missing Buttonheads Found: $\begin{array}{c c} (11.4) \text{ Missing Buttonheads Found:} \\ \hline Yes \\ \hline No \\ \hline Quantity: \\ \hline Additional Information: Shim stack ht 6.6 \\ \hline (4, 2, \frac{12}{2}) \\ \hline \end{array}$ (12.2) Number of Protruding Buttonheads (\forall): \overrightarrow{O} (8.3) Illumination source $ceFcc-11$ - $CH8$ $WA Flashlight$	i	-						/	
Image: Spin stack for the	ł		· •		<u> </u>	୵ୖ୵ୖ୵ୖ	and a second sec	j	
Additional Information: Shim stack ht 6.6 (4, 2, 1/2) (12.2) Number of Protruding Buttonheads (v): 0 (8.3) Illumination source <u>cettoc-11</u> - 048 11/4 Flashight	1 .	-					r	,*	}
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(a) while a contract of the co	(12.2)	Number of Proto	ding Buttonheads (e): ۲٦	(8.3) Illumination	source at	an it she	y n/ et.11.	14.
(12.3) Number of Missing Buttonheads (Ø, Ø): O	4		-		, we y manimation		<u>x-11</u> "On	s vya tushig	htj
(12.4) Total of Protruding + Missing Buttonheads: 0 (12.6) Continuity Test Requested ? () Yes (XNo			• •		(12.6) Cor	tinuity Test (Reministed 2	TYAC IN	
(12.5) Total # of Effective Buttonheads Seated: 169 Wires Identified? A Yes No	1		-	······································	. (12.0) 001				
NYA.					- Customer No			YA 005_	WPP 10-31-1
QC Reviewed: Date:	QC R	Reviewed:		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	L	.evel:	ón, Pall s∵nt a shersing "BPAC by	Date:	W.Y. MARTY R. MILL I MATURE AND DESCRIPTION
					••••			<u> </u>	
				anti anti a' un cunt a 27 miller Meller atta di si		I WART RAILING CAMER & A.S.			

18 SQ 8.0, TMI; 13 ISI

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REP-1098-510 Appendix H	, Page	13 of 20
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PRECISION SUBJECT LANCE)		N1091 PSC PROCEDURE SQ 8.0 ANCHORAGE INSPECTION Sketch Sheet 8.0 09/03/1 Page 1 of Revision 0
Project: Exelon 2012 TEND	DN SURVEILLANCE		UNIT 1
Tendon No.: <u>H13-09</u>	Tendon End: Butter	<u>css1</u>	Shop 🗌 Field
number; record the location of t Sheets as necessary being sur	pears in the anchorheads/bushings, s e anchorhead or bushing identification to list the page number below and to rt in accordance with Procedure QA 9.	in and apply to the apply a Sketch N	sketch. Use as many Sketch umber to each unit with cracks.
	TOP VIEW	H I 3 - 08	
			"Shim W/a 1"gap
			"Shim WA 1" SAP. E'Shim N/A 0.9" SAP.
			Theker Head
	BOTTOM VIEW	H 13-08	
			- (Bearing Plate
			4" Shim WA- 1/8 gAP.
			Z" shim (closed NogAp)
			1/2" Shime Closed NO 340) chor head
QC Inspector: W. Para	Robb	Level: II-	Date: 10-31-1
QC Reviewed:	₩ \$ ₩21282379994 12522888\$#19057899999999999999999999999999999999999	Levet:	Dale:



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N1091 PSC PROCEDURE SQ 8.0 ANCHORAGE INSPECTION 09/03/13 Page 3 of 8 Revision 0 Revision: 1, 10/04/13

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7.0 PREREQUISITES

- 7.1 The Anchorage Cleanup will be completed.
- 7.2 The tendon will be in a stressed condition.
- 7.3 <u>QCD</u> Document the tendon identification and tendon end on Data Sheet 8.0A or 8.0B, ANCHORAGE INSPECTION.

8.0 ANCHORAGE INSPECTION

- 8.1 The tendon anchorage, including the anchorhead, bearing plate, stressing shims, buttonheads and wires of all selected tendons shall be visually inspected (Detailed Visual Examination) for signs of corrosion, cracking, missing wires, protruding buttonheads and signs of deformation.
- 8.2 This inspection is to be performed with light conditions supplemented by auxiliary light sources if needed.
- 8.3 <u>QCD</u> Record the illumination source used on Data Sheet 8.0A or 8.0B as applicable.
- 8.4 For Detailed Visual Examinations, access must be sufficient to place the eye within 24 inches, at an angle not less than 30° to the surface.
- 8.4.1 Mirrors may be used to improve the angle of vision.
- 18.5 <u>QCD</u> The gap between shim halves for the first set of shims under anchorhead shall not exceed an average of 0.25". A maximum gap of 0.50" is acceptable at one gap location if other side of shim halves is in contact. The remaining shims are allowed a maximum gap of 0.50" at each location of shim halves. Exelon Engineering shall be notified by a Nonconformance Report if the average shim gap exceeds 0.25". A gap of 0.50" on one side and 0" on the other side is acceptable.

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			N1091 PSC PROCEDURE QA 9. NONCONFORMANCE
	and the second		NC/CAR FOR
	Careford Contraction		09/03/1 Revision
PRECISION SURVER	LANCE		Page of
		na af fan an fan fan fan fan ser fan	
n fan ferste general general general fer en de service fan de service ferste general ferste general ferste gene	NONCONFORMANCE / CC	DRRECTIVE ACTION REF	ORT FORM
HOLD TAG NO.:	N/A	NC / CA N	10.: <u>NCR-NID91-006</u>
IONCONFORMANCE:	ON tendon D-143 the	arease loss to	grease replaced difference
exceeds 10%. т	he Actual difference	e is 59,94%, t	er PSC omcedure S.Q 12.1
sec. 15.1 the cli	ent is to be Notifi	ed by A NCR.	Per PSC procedure S.Q 12.1
		<i>, , , , , , , , , , , , , , , , , , , </i>	
APPARENT CAUSE KNO		IF YES, DESC	RIĐE:
	CYNC ACTION		
KECOMIMENDED COKKE	Client 1	to determine.	
ANY NONCONFORMING	ITEM TO BE REPAIRED SHALL I	HAVE AN APPROVED RE	
	Concern Reconnence.	lient to deteri	mine.
INITIATOR:		TITLE	DATE:
SIGNIFICANT COND	ITION: YES	NO IF YES	, REFER TO GAM SECTION 15.
APPROVAL COMMENTS	;;		
			as "/13/13
PSC APPROVAL	QC N. Pance Poblar.	QA LID	11/13/13 ENGINEERING
SIGN & DATE:	11-13-13	ABurron	e #/14/13 Quel Mill "1
EXELON APPROVAL			
REQUIRED YES			DATE
	QA	······································	DATE
COMMENTS:			
<u>, , , , , , , , , , , , , , , , , , , </u>	DISTRIBUTION		
X QA SECTION			DISPOSITION COMPLETED
C QE SECTION	CONTR. MGMT.	Site File	TITLE:
			DATE:
A PROMERNING			
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N 1091 PSC PROCEDURE SQ 12.1 GREASE REPLACEMENT Data Sheet 12.1a - Pressure Pumping 09/03/13 Page 1 of 1 Revision 0

Project: TMI 40 th YEAR TENDON SURVEILLANCE Tendon No.: <u>D-1</u>	43
GREASE REPLACEMENT	OC SIGNOFFS
(8.4) Grease Used NEW OLD - TEST DATE: ACCEPTABLE APPROVAL LETTER	<u>VRR 11-12-13</u>
(8.5) Total Grease Loss from Data Sheet 6.0 for <u>Sourth</u> tendon end: <u>15.5 gal.</u>	NRP 11-12-13
(8.6) Total Grease Loss from Data Sheet 6.0 for <u>E43+</u> tendon end: <u>Å, ð gal.</u>	WRR 11-12-13
(8.7) Estimated grease losses from leaks for <u>South</u> tendon end: <u>Orgal</u>	WR211-12-13
(8.8) Estimated grease losses from leaks for <u>EAS</u> + tendon end: <u>Proal.</u>	UCE.11-12-13
(8.9) TOTAL Tendon Grease Loss:	WER 11-12-13
12.0 INITIAL PRESSURE PUMPING	
(12.6) Ambient Temp.: <u>36 °F</u> Thermometer ID: <u>PK-A</u> Recal Date: <u>10-11-14</u>	
(12.7) Grease Temp.: <u>200 °F</u> Thermometer ID: <u>PK-A</u> Recal Date: <u>10-11-14</u>	
(12.9) Initial Grease Height (a) <u>43,5</u> in. (12.14) Final Grease Height (b) <u>3</u> in.	
(12.16) Total amount of Grease Pumped: 71.69 gal (a-b) x 1.77 into the South end	
(12.18) Quantity of Waste Grease: [,] gal. (12.17) Was Exit Achieved? [X] Yes [] No	
12.19) Total Grease <u>Replaced</u> this end: <u>70,69 gal.</u> If no, Pressure Held for <u>N/A</u> psi <u>N/A</u> min	418R 11-12-13
13.0 HAND PUMPING - SECOND END (if necessary)	
(13.6) Ambient Temp: °F Thermometer D: Recal Date:	
(13.7) Grease Temp.: °F Thermometer/10: Recal Date:	
(13.9) Initial Grease Height (a) in. (19:42) Final Grease Height (b) in.	
(13:14) Total amount of Grease added:	
(13.16) Quantity of Waste Grease:	
(13.17) Total Grease <u>Replaced</u> this end: gal,	
14.0 CALCULATION OF PRESSURE PUMPING	Ì
(14.1) Total <u>Tendon</u> Grease Replaced: <u>70,69 gal.</u> (12.19 + 13.17)	
(14.2) Net Tendon Duct Grease Volume: <u>35,4 gal.</u> Roler to SQ 122 - Hillerse Volumes Toriche Tendon Met Citet Volume	
(14.3) Percent Difference: Total Tendon Replaced (14.1) - Total Tendon Loss (8.9) × 100 = <u>.59.94</u> % Difference	WRR 11-12-13
(14.4) Grease Leaks: 🔲 Yes 🔯 No	WEL 11-12-13
(14.5) Refill Acceptable: [] Yes (less than 10%) X No (greater than 10%)	NR. P. 11-12-13
If No – Customer Notified NCR No.:	NER 11-12-19
(14.6) Comments: NONC	
	MALING STATISTICS
QC Reviewed: <u>N U Marcing</u> Level: <u>U</u> Date: <u>11[13]</u>	(3)
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and in a she way to be a she w	NONCONFORMANCE / C	ORRECTIVE ACTION REP	PORT FORM
HOLD TAG NO .:	N/#	NC / CA N	0.: <u>NCR- N1041-007</u>
vonconformance: C lifference excer procedure SQ	NA tendon D 146 t 2013 1096. The Ac- 12.1 Sec. 15.1 th	he grease loss tust difference e client is to d	to grease replaced. is 58.849, Per PSC he notified by a NCR.
APPARENT CAUSE KNO	NN: 🗌 YES 🕱 NC) IF YES, DESC	RIĐE:
RECOMMENDED CORRE	CTIVE ACTION: CLIENT	to determine.	
	ITEM TO BE REPAIRED SHALL		₩₩₩₽₩₩₩₩₽₩₽₩₩₽₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩₩
	С	lient to deteri	nine.
INITIATOR:	······	TITLE	DATE:
SIGNIFICANT COND APPROVAL COMMENTS] NO IF YES	, REFER TO QAM SECTION 15.
PSC APPROVAL SIGN & DATE:	90 W. Jance Kold 11-13-13	= ABussione	11/14/13 AM Mall 11/14/19
EXELON APPROVAL REQUIRED			DATE
COMMENTS:	QA		
			an a suman and a construction of the construct
A SECTION	DISTRIBUTION	U VENDOR	DISPOSITION COMPLETED
	CONTR. MGMT.	D Site File	SIGNED:
			DATE:
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N1091 PSC PROCEDURE SQ 12.1 GREASE REPLACEMENT Data Sheet 12.1a - Pressure Pumping 09/03/13 Page 1 of 1 Revision 0

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Project: TMI 40 th YEAR TENDON SURVEILL	ANCE		Tendon No.: D1	4/2
GRE/	ASE REPLACEMENT	ander 9. an eine seine gesten der Stater under sein der Stater der Stater der Stater der Stater der Stater der	ny z karater zanadi na	UC SIGNOFFS
(8.4) Grease Used Si NEW OLD - TES 8.0 PREREQUISITES	I DATE:	CEPTABLE	DATED:	WRIZ 10-24-13
(8.5) Total Grease Loss from Data Sheet 6.0 for	South tendon	end:	11.6 gal.	NRE 10-21-13
(8.6) Total Grease Loss from Data Sheet 6.0 for	EAS- tendon	end:	4,6 gal.	WER 10-21-13
(8.7) Estimated grease losses from leaks for	South tendon	end:	() gal.	HER IDEL-13
(8.8) Estimated grease losses from leaks for	Easof lendon	end:	O gal.	WER 1021-13
(8.9) TOTAL Tendon Grease Loss:			15,5 gal.	MPP 10-21-13
12.0 INITIAL PRESSURE PUMPING (12.6) Amblent Temp.: 3기 또 Thermo	ometer ID: <u>PK - A</u>	Recal Date	»: <u>10-11-14</u>	
(12.7) Grease Temp.: 220 F Thermo	meter ID: <u>PK-A</u>	Recal Date	»: <u>10-11-14</u>	
(12.9) Initial Grease Height (a) 62.75	<u>in.</u> (12.14) <u>Finat</u> G	irease Hoight (l) <u>26.5 in</u>	
(12.16) Total amount of Grease Pumped:	64,16 gal. (A-b) x 1	.77 into th	• South end	
(12.18) Quantity of Waste Grease:	1, O gal. (12.17			1
,12.19) Total Grease <u>Replaced</u> this end:	63.16 gal. If no, 1	Pressure Held (or N/A psi N/Amin	WPP 11-13-1
13.9-HAND PUMPING - SECOND END (if neces	•••		an a haran an a	1
	ometer ID:	Recal Dat	e:	
	ometer Its:	Recal Dat		
(13.9) <u>Initial</u> Grease Height (a)		Grease Height (
(13.14) Total amount of Grease added:		1.77 into (A CONTRACTOR OF THE OWNER	
(13.16) Quantity of Waste Grease:	gal. (13.1)	5) 🗋 Poured	Hand Pumpad	
(13.17) Total Grease <u>Replaced</u> this end:	gal.		می این می با در می این می با ای می بین می با این می با	
14.0 CALCULATION OF PRESSURE PUMPING (14.1) Total Tondon Grease Replaced:	1 63,16 gal. (12.19	5 49 4 ³⁴		_
(14.1) Notal <u>Tendon</u> Orease Keplaced. (14.2) Net Tendon Duct Grease Volume:			I have been the Tex to a the Development	
			LNES, for the Terdon Net Duct Volume	
(14.3) Percent Difference: Net Tender Ver	don Duct Grease Volume (14.)		0 = <u>58.84</u> % Difference	»
(14.4) Greese Leaks: 🔲 Yes	No No			419811-13
(14.5) Refill Acceptable: 📋 Yes tiess than 10%)	🔯 NO (greater then 103	;}		1.2211-15
(14 G) Commonter I. A	If No – Customer Notified		1.118 1.1.1.2.1.5	1. SCR. 18-13
] QC Reviewed:	Level:		Date:	

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Topical Report 213 Attachment 2 Page 905 of 1008

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PRECISION SURVEY	LANCE		N1	091 PSC PROCEDURE QA 9.0 NONCONFORMANCES NC/CAR FORM 09/03/13 Revision 0 Page of
an the same of the same	NONCONFORMANCE / COR	RECTIVE ACTION REP	ORT FORM	
HOLD TAG NO .;	N/A	NC / CA N	0.: <i>L</i>	VCR-N1091-008
NONCONFORMANCE:	ON tendon D.237 the g exceeds 10%. The Al procedure SQ 12.1 sec A NCR,	grease loss to cluAl different . IS.I the clien	grease ne le is 48 t is to b	placed difference. 08%. Per PSC e Natified by
APPARENT CAUSE KNO	WN: 🗍 YES 🕅 NO	IF YES, DESC	RIBE:	
RECOMMENDED CORRI	ECTIVE ACTION: Client to	determine.		
· · · · · · · · · · · · · · · · · · ·	ITEM TO BE REPAIRED SHALL HA	VE AN APPROVED RE	PAIR PROCE	DURE.
CORRECTIVE ACTION T	O PREVENT RECURRENCE: Cli	ent to determ	ine.	
INITIATOR:		TITLE		DATE:
SIGNIFICANT CON		IF YES	, REFER TO G	AM SECTION 15.
APPROVAL COMMENTS	5:			
PSC	ac W. Bance Pollom	QA		ENCAVEERING
APPROVAL SIGN & DATE:	11-14-2013	ABussone	ulution	all milliglis
EXELON APPROVAL			······································	
REQUIRED [] YE	S NO ENGINEER		DATE	
COMMENTS:	QA DATE			····
	an tha an			м
an a dhalan an an ann an an an an an an an an an	DISTRIBUTION	<u></u>	DISI	POSITION COMPLETED
A SECTION	VICE PRESIDENT		SIGNED:	
QE SECTION	X CONTR. MGMT.	Site File	TITLE	
	X EXELON		DATE:	
	\$*10\$\$100\$7\$00\$7****C\$100\$200\$*******************************	<u>na na selata mangang ng Kangang térak sa tang kang térak sa 19</u> 2	والاستعمادة مرابع الارابية معمارية وموارعتهم	43 QA 9.0 TMI.13



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N 1091 PSC PROCEDURE SO 12.1 GREASE REPLACEMENT Data Shoet 12.1a - Pressure Pumping 09/03/13 Page 1 of 1 Revision 0

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Project: TMI 40" YEAR TENDON SURVEILLANCE	Tendon No.:	237
GREASE REPLACEMENT		QC SIGNOFFS
(8.4) Grease Used INEW OLD - TEST DATE: ACCEPTABLE] APPROVAL LETTER DATED:	ANER 11-13-13
(8.5) Total Grease Loss from Data Sheet 6.0 for West lendon end:	16,0 gal.	NKR 11-13-13
(8.6) Total Grease Loss from Data Sheet 6.0 for 5. EAST lendon end:	4,7% gal.	WRR 11-13-13
(8.7) Estimated grease losses from leaks for Nest tendon end:	_62- gal.	132C11-13-13
(8.8) Estimated grease losses from leaks for <u>5. EAST</u> tendon end:	B gal.	WRE11-13-13
(8.9) TOTAL Tendon Grease Loss:	20.75 gal.	JRR(1-13-13)
12.0 INITIAL PRESSURE PUMPING		
(12.6) Ambient Temp.: 30 °F Thermometer ID: DK-A Recal Date:	10-11-14	
(12.7) Grease Temp.: 2.20 °F Thermometer ID: PK-A Recal Date:	10-11-14-	
(12.9) Initial Grease Height (a) 64 in. (12.14) Final Grease Height (b)	26.15 in.	
(12.16) Total amount of Grease Pumped: 66.37 gal. (a - b) x 1 77 into the	West end	
(12.18) Quantity of Waste Grease:	wed? [7] Yes [] No	WER
(12.19) Total Grease <u>Replaced</u> this end: <u>65,37</u> gal. If no, Pressure Held fo	NA psi NA min	11-14-13
13.0 HAND PUMPING - SECOND END (if necessary)		
(13.6) Ambient Temp:: °F Thermometer ID: Recal Date		
(13.7) Grease Temp.: 2F Thermometer ID: Recal Date	:	
(13.9) Initial Grease Height (a) in. (19-12) Final Grease Height (b) <u>in.</u>	
(13.14) Total amount of Grease added: gal. (a - pix 1.77 - into the	and and	
(13.16) Quantity of Waste Grease: gav (13.15) Poured	Hand Pumped	
(13.17) Total Grease Replaced this end: gal.	······································	**
14.0 CALCULATION OF PRESSURE PUMPING	nandin ya kadanging takangkan ya kun yan kun kun kunakan k	
(14.1) Total Tendon Grease Replaced: 65,37 gal. (12.19 + 13.17)		
(14.2) Net Tendon Duct Grease Volume: 42.8 gal. Roterio SQ 12.2 - GREASE INLA	IES, fortra: Tendoa Net Duct Valenta	
(14.3) Percent Difference: Total Tendon Replaced (14.1) - Total Tendon Loss (8.9)	= 43.08 % Difference	
Her rendon Duct Greater Volume (14.2)	= <u>m pro p</u> 73 canetence	NRE 11-14-13
(14.4) Grease Leaks: 🛄 Yes 🗱 No		JR8-11-14-13
(14.5) Refill Acceptablo: (Yes tess than 10%) (In No (greater than 10%)	• • · • • • •	WRR 11-14-13
If No Customer Notified NCR No.: <u>N/</u> (14.6) Comments: <u>N/@NP</u>	091-008	WR211-14-19
(14.6) Comments: <u>Mone</u>		
and the second	ar na far an	
QC Reviewed:Level:	Date: 1/////	<u>145</u>
[]	31 \$	Q 12.1 TMI. 13 ISI

Topical Report 213 Attachment 2 Page 907 of 1008



MI NUCLEAR PLANT - UNIT 1 - 40 th Year			
FIELD CHANGE REQUEST INDEX I	.0G		
DESCRIPTION	DATE WRITTEN	DATE APPROVED	DATE REV.
Due to disamie seismic inst. IN the Area of D-143 S.E. and WRR N.IT.IS S.E. and. It will be inaccessable for AM NOFK.	10-17-13		
Add duct volumes for H24-47 and N/3-08	11-4- B		
	<u></u>		
			1
	FIELD CHANGE REQUEST INDEX I DESCRIPTION Due to givenie Seismic inst. IN the Area of D.143 S.E. and. The mill be inaccessable for MM. MORK. Add duct volumes for H24-47 and H/3-08	FIELD CHANGE REQUEST INDEX LOG DESCRIPTION DATE WRITTEN Due to giogmie Seismic inst. IN the Area of D-143 ID-17-13 S.E. and. The mill be inaccessable for MM. WORK. ID-17-13 Add duct volumes for H 24-47 and M/3-05 I.I.I.I.I.I.I.I.I.I.I.I.I.I.I.I.I.I.I.	FIELD CHANGE REQUEST INDEX LOG DESCRIPTION DATE WRITTEN DATE APPROVED Due to chomic seismic inst. IN the Area of D-143 S.E. and. The mill be inaccessable for ARM work. ID-17-13 Add duct volumes for H 24-47 and H/3-08 ID-17-13

PRECISION SUBJECT ANCE					ROCEDURE QA 7.0 SE REQUEST FORM 09/03/13 Page 1 of 1 Revision 0
SPECIAL FIELD REVISION CONTROL	FIELD CH		EST NO.: FCR -/	100-1001	
REQUEST BY: <u>Dustin En</u> Driginator: <u>W. Range, R</u>		P3C 31	•	: <u>10-1</u> : <u>10-1</u>	
	2.0 REV NO.:	<u>0</u> PRC	CEDURETITE	Surveill	NNCE SCOPE
AFFECTED SECTION: Table	1	RE	ISION TO MANUA	. REQUIRED:	YES MO
	XINO NCR NU	MBER:	N/A +	IOLD TAG NO.	NA
RECOMMENDED CHANGE: Cha	uge 10 D.14	6.			
PSC APPROVAL SIGN & DATE: EXELON APPROVAL OR COMMENT Engineening Data 5	usaone 10/17/13	10.	NCE Abland 17-2013		Bullinger
Formal transmittal	Ho follow via	TODI	5971-2013	- 033.	
APPROVED SITE QA AUTHORITY:	MAL	TIVLE:	Eng. Propr	TWS DATE	10/17/13
DISPOSITION PSC QC: QC INSPECTOR:	Hold Tag Applied:		HOLDTA		
DISTRIBUTION	<u> </u>				
🚺 EXÊLON QA 18. QA PSC 19. FNGINEERING PSC	Image: State of the state		점 QC PSC 원 <u>- 3과은 타</u> 라우. 미		
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	فكالأعة الراكة ويرابقا القريم ومجمعها يتوسعهم		1. 1 1923 LAND 10 A 1944 A 19 K 2445 (1945)	anna 27 a thairte a thairt a thairt	40 OA 70 FM 13 K

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Gerald Bussone

From:	Nick Darlage
Sent:	Thursday, October 17, 2013 3:39 PM
То:	Gerald Bussone; Paul Smith; Christopher Cox; William Robbins; Dustin Estep
Subject:	FW: Preliminary Tendon Data: FCR Response from TMI
Attachments:	FCR N1091-001.pdf; ATT00001.txt

Nick Darlage Precision Surveillance Corporation

From: Grimm, Michael:(GenCo-Nuc) [<u>mailto:Michael.Grimm@exeloncorp.com</u>] Sent: Thursday, October 17, 2013 3:26 PM To: Stein, Howard:(GenCo-Nuc); Nick Darlage; Taylor, Sean Ryan:(GenCo-Nuc); Espenshade, Marvin H:(GenCo-Nuc) Subject: RE: Preliminary Tendon Data: FCR Response from TMI

Nick,

Attached is the signed FCR. You will receive a TODI formally transmitting the values in this email chain tomorrow.

Thanks,

Mike

Michael Grimm Reactor Vessel Internals/ISI Programs Engineer. EIT

Exelon Generation.

Three Musicalast 2625 Role: Road, Modiercam, PA 17157 Official 717-043 B356 michael.grimm@exeloncorp.com, www.exeloncorp.com

From: Stein, Howard:(GenCo-Nuc) Sent: Thursday, October 17, 2013 3:59 PM To: Nick Darlage; Grimm, Michael:(GenCo-Nuc); Taylor, Sean Ryan:(GenCo-Nuc); Espenshade, Marvin H:(GenCo-Nuc) Subject: RE: Preliminary Tendon Data: FCR Response from TMI Importance: High

Mike-

Please see Nick's comment below.

Thanks, Howard

From: Nick Darlage [mailto:ndarlage@pscnuclear.com] Sent: Thursday, October 17, 2013 3:22 PM To: Stein, Howard:(GenCo-Nuc) Subject: RE: Preliminary Tendon Data

Thanks Howard.

Can we get Mike to Sign that FCR and reference this information within his response?

Thank you,

••

Nick Darlage Precision Surveillance Corporation

From: Stein, Howard:(GenCo-Nuc) [mailto:Howard.Stein@exeloncorp.com] Sent: Thursday, October 17, 2013 2:15 PM To: Nick Darlage Subject: FW: Preliminary Tendon Data

Here is info Nick!

From: Grimm, Michael:(GenCo-Nuc) Sent: Thursday, October 17, 2013 2:12 PM To: Stein, Howard:(GenCo-Nuc) Subject: Preliminary Tendon Data

Howard,

Please distribute this information so we can start on D-146. We need to get the TODI signed off and we have not been able to get the right people yet this morning. Will get by end of day. Work can proceed at risk with the information below.

Tendon Stressing Data:

Tendon Number	Normalization Factor	Predicted Force (Kips)	95% Predicted Force (Kips)	90% Predicted Force (Kips)
D-141	47	1059	1006	953
D-146	-4	1110	1055	999
D-149	52	1055	1002	950

Tendon Net Duct Volume:

Tendon Number	Net Duct Volume (GAL)	10% Net Duct Volume (GAL)
D-141	80.6	8.06
D-146	81	8.1
D-149	75.84*	7.58*

*Tendon D-149 installation cards are not included in electronic files and are not readily available. The net duct volume provided is the minimum value per calculation C-1101-153-E410-033 Revision 0, *Dome Tendon Grease Void Calculations*.



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Thanks,

Mike

Michael Grimm Reactor Vessel Internals/ISI Programs Engineer, EIT



Inrae Mile is and 2625 River Road, Mildletown, PA 17057 Office, 717-943 \$306 michael.grimm@exeloncorp.com/www.exeloncorp.com/

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TODI 5971-2013-033

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THREE MILE ISLAND TRANSMITTAL OF DESIGN INFORMATION					
SAFETY RELATED	Originating Organization TMI Programs Engineering	ID# <u>5971-2013-033</u> Revision <u>0</u> Page 1 of 2			
To: Nick Darlage PSC 3468 Watling St. East Chicago, IN 46312					
Subject: Replacement Tendon	Engineering Data				
Sean Taylor	Michael Grimm <u>10/18/13</u> Prepared by Signature Date Sean Taylor <u>Lean Taylon</u> 10/18/13				
Greg Ciraula Approved by	nature	10/18/13 Date			
Status of Information:	Verified Unverified EngIneering Judgement				
Action Tracking # for Method and for Unverified DESIGN INFORMA		N/A			
Description of Information: TMI is currently performing the 40 th Year Tendon Surveillance on Unit 1. During surveillance activities a tendon (D-143) in the current inspection population was identified to be inaccessible due to interferences from installed plant equipment. Engineering data, including the stressing information and net duct grease volumes of the replacement tendon (D-146) and its adjacent (D-149 and D-141) is being transmitted for revision of the PSC inspection manual.					
Purpose of Information: TMI is currently performing the 40 th year tendon surveillance on Unit 1. To support the continued performance of the surveillance TMI is supplying PSC with engineering data for the replacement tendon (D-146) and its adjacent (D-149 and D-141). This information will be incorporated into a revision of the PSC inspection manual. This TODI submittal provides information from AR EVAL A2238266-04, <i>Tendon Net Duct Volume Technical Evaluation</i> , and the stressing data for D-146 and its adjacents (D-149 and D-141) taken from calculation C- 1101-153-E410-046 Revision 0.					

Tendon Stressing Data:

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Tendon Number	Normalization Factor	Predicted Force (Kips)	95% Predicted Force (Kips)	90% Predicted Force (Kips)
D-141	47	1059	1006	953
D-146	-4	1110	1055	999
D-149	52	1055	1002	950

Tendon Net Duct Volume:

Tendon Number	Net Duct Volume (GAL)	10% Net Duct Volume (GAL)	
D-141	80.6	8.06	٦
D-146	81	8.1	1
D-149	75.84*	7.58*	٦

*Tendon D-149 installation cards are not included in electronic files and are not readily available. The net duct volume provided is the minimum value per calculation C-1101-153-E410-033 Revision 0, Dome Tendon Grease Vold Calculations.

PSC to sign and confirm receipt of this information:

Bussone PSC OA Managy Date: 10/18/13 Receipt: 0

References:

- 1) CC-AA-310, Transmittal of Design Information
- 2) C-1101-153-E410-046, Tendon Force Predictions
- 3) C-1101-153-E410-033, Dome Tendon Grease Void Calculation
 4) Technical Evaluation A2238266-04, Tendon Net Duct Volume

Supplemental Distribution:

E - Mail: ndarlage@psctendon.com

Hard Copy: EDMS

SPECIAL FIELD REVISION CONTROL FIELD CHANGE REQUEST NO.: ECR N 10 91 - 002 REQUEST BY: DUS-LIL ESTER TITLE: PSC Sup. DATE: 11-4-2013 ORIGINATOR: M. RANCE Robbins TITLE: PSC QL. DATE: 11-4-2013 PROCEDURE NUMBER: S.Q. 12.2 REV NO: D PROCEDURE TITLE GRASSE ValueS AFFECTED SECTION: 2.2 TABLE. 7-1 REVISION TOMANUAL REQUIRED: UYES RIM NCR REQUIRED: UYES RIMO NCR NUMBER: M/A HOLD TAG NO: M/A DETAILED DESCRIPTION OF EXISTING CONDITION: (USE EXTRA PAGES OR WRITE ON BACK) MAC M/A NCR REQUIRED: UYES RIMO NCR NUMBER: M/A HOLD TAG NO: M/A MCL grasse duct volume for H 24-477, gasked repair teadout, And HILL Scope. Neck drout, Replaced with H 13 HEU dro field from the scope. Neck drouged from the scope. Neck drouged from the scope. Neck drouged from the scope. RECOMMENDED CHANGE: Add net duct volumes for the two heudows lister Above. MOUD TAG MOUD TAG REPROVAL OR COMMENTS: MADUEL MOLD TAG MOLD TAG MOLD TAG DISPOSITI	PRECISION SURVEILLANC	E	1978-1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1994 - 1 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 - 1974 -	N1091 PSC PROCEDURE QA 7.0 FIELD CHANGE REQUEST FORM 09/03/13 Page 1 of Revision 0
ORIGINATOR: M. RAACE Robbins TITLE PSC QL DATE: 11-4-2013 PROCEDURE NUMBER: S.Q. 12.2 REV NO: D PROCEDURE TITLE Grease Volumes AFFECTED SECTION: 2.2. TALL. 7-1 REVISION TO MANUAL REQUIRED: VESTOR NCR REQUIRED: VESTOR NO NOR NUMBER: M/A HOLD TAG NO: M/A DETAILED DESCRIPTION OF EXISTING CONDITION: USE EXTRADAGES OR WRITE ON BACKY NCR REQUIRED: VESTOR OF EXISTING CONDITION: USE EXTRADAGES OR WRITE ON BACKY Need grease duct volume for H 24-47, gasked repair tendows, And H 13 .08, N lich was daemed in accessable and replaced with H 13 thew droped from the scope. RECOMMENDED CHANGE: Add net duct volumes for the taxo tendoms list above. PSC APPROVAL SIGNA DATE: DATE: DISPOSITION PSC QC: HOLD TAG APPREVED SITE GA AUTHORITY: TITLE: DISPOSITION PSC QC: HOLD TAG APPLIED: APPLED: DISPOSITION PSC QC:	SPECIAL FIELD REVISION CO	ONTROL FIELD C	HANGE REQUEST NO.: FCR	500- 1901 N
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TODI 5971-2013-037

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SAFETY RELAT	Г	Originating Organiz MI Programs Engin		ID# <u>59</u> Revision <u>0</u> Page 1 of 2	071-2013-037
To: Nick Darlage PSC 3468 Watling S East Chicago,					
Subject: Addition	al Grease Volds f	or 40 ^m Year Tendor	n Surveilla	nce	
Michael Grimm Prepared by Sean Taylor Reviewed by Mark Torborg Approved by	Signatu Signatu Signatu Signatu	n Taylo		<u>/0/3//</u> Date <u>///3///2</u> Date <u>///03///</u> Date	<u>7</u> 3 3. 3
Status of Information	Un Un	ified verified jineering Judgement			
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continued perf volumes for us leaking end ca inaccessibility	y performing the 4 ormance of the su te on tendon H24-4 p. H13-08 was in t . The tendon is ha is not previously t	10 th year tendon sur Irvelilance TMI is su 47 and H13-08. H24 the original outage Iving a visual exam ransmitted.	Ipplying F -47 was a scope and	SC with addit deled to the ou l was removed	ional grease void utage to repair a d due to
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PSC to sign and confirm (Receipt:	receipt of this information:	Datə:
3) Technical Evaluation A2238	Design Information rizontal Tendon Grease Void Calculatio 8266-02, Tendon Net Duct Volume 8266-04, Tendon Net Duct Volume	n
Supplemental Distribution:	E - Mail: ndarlage@psctendon.com	Hard Copy: EDMS

From: Grimm, Michael:(GenCo-Nuc) Sent: Thursday, October 31, 2013 11:24 AM To: Espenshade, Marvin H:(GenCo-Nuc) Cc: Steln, Howard:(GenCo-Nuc); <u>hthill@hthpe.com</u>; Taylor, Sean Ryan:(GenCo-Nuc) Subject: Grease Void Info

Butch,

Please pass this info on to Rance. I will send the TODI out with this information once signed. Just want to make sure you guys have it.

Tendon Number	Net Duct Volume (GAL)	10% Net Duct Volume (GAL)
H24-47	110.1	11.01
H13-08	110.7	11.07

Thanks,

Mike

This e-mail and any attachments are confidential, may contain legal, professional or other privileged information, and are intended solely for the addressee. If you are not the intended recipient, do not use the information in this e-mail in any way, delete this e-mail and notify the sender. -EXCIP



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CONCRETE EXTERIOR DATA SHEET SQ 8,4 09/03/13 Page 1 of 1 Revision 0

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VISUAL EXAMINATION	- GENERAL VISUAL EXAMINATION						
Project <u>TMI Unit 1</u> Surveillance #							
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Spalls	*Indication of Degradation Due to Vibration						
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PRECISION SURVEILLANCE

REP-1098-510 Appendix J, Page 2 of 70

VISUAL EXAMINATION	- GENERAL VISUAL EXAMINATION					
roject TMI Unit I Surveillance #	<u>40TH</u> Year <u>2013</u>					
nspection Area: <u>Buttress 2</u>						
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Popouts and Voids	Corrosion on Grease Cans, Bearing Plates or Anc	hore	ge			
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(IO) findings for the pu	prose of documentation and orientation.)		•				
	s to be Examined For (PSC Procedure 8.4)	C72-0014	Circum Cir	al d sea luine			, mised
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Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surfaces	,					
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Cracks	*Excessive Corrosion on Exposed Embedded N			aces			
Scaling	*Detached Embedments or Loose Bolting						
Spalls	*Indication of Degradation Due to Vibration		_				
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Land the second s	i na na manana akan ya ana ana na manan ingina na ingi a na ingi ana ingi angi a		21	0 80 8	4 7	M) 12	i Qi
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nspection Area: <u>Buttress 3</u> outside quipment Used <u>Tape measure</u> ; feeler gage F78 due cal				
animent Used Take measure frage and FR due cal				
THE MERICE TO UTE CAT	9/30	114	and	
Test Chart S/N OC11-026		and the second		-
Concrete Surface Condition				
Containment Surface (Findings and Description)		NI	10	RI
Embed plate pulled away from face of concrete				
racking and degraded grout patch at constructi	on			
seam		П		
				T
		T -		
Initial examination was performed remotely with			┼╌┾═┽╌	
the aid of binoculars, Locations requiring		十十	┼┲┥╸	十一十十
		-	┼╍╞═╡╌	┢┝┝┥
locations as noted above.		╞═┿╴	╆╍╊═╉╌	┼╍┝═╡
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(Use as many sketch sheets (page 2) as needed to report any Recordable Indication (Infor	mation	Only
(IO) findings for the purpose of documentation and orientation	1.)			
Recordable Indications to be Examined For (PSC Procedure 8.4)				
Leaching or Chemical Attack Deterioration of any Concrete Coating (if a		:)		
Abrasion or Erosion Degradation Tendon Grease on Exposed Concrete Surfa			1	
Popouts and Volds Corrosion on Grease Cans, Bearing Plates of				
Cracks *Excessive Corrosion on Exposed Embedd	ied Met	al Surf	faces	
Scaling *Detached Embedments or Loose Bolting			· .	
Spails *Indication of Degradation Due to Vibrati Corrosion Staining on the Concrete Surface (* The owner/agent must be notified for the owner/agent must be nowner/agent must be notified for the owner/agent must b		tod oo	nditions	
Exposed Reinforcing Steel	mese no	teu co	uuuua	•)
	REL	Bul		
Comments and Disposition by Responsible Engineer				
Comments: EMAGD PLATE REQUIRES FURTHER EXAMIN				Arria
	<u>~ [/ / / / / / / / / / / / / / / / / / </u>			- <u> </u>
\sim \sim \sim \sim	······			
Laure Plant The Date	151	21	1	
Inspector & Level: Le UP-UP II Date:	-4	<u>}</u>	277	
Responsible Engineer. Date: Date:	144	-674	14	
ANII: Date:		1		

PRECISION	BURVEILLANCE	REP-1098-510 Appendix J, Page 5 of 70	CONCRETE EXTERIOR SKETCH SHEET 8.4 09/03/13 Page X of X Revision 0
Project:	TMI 2013 40 TH YEA	R TENDON SURVEILLANCE	nen for en forsken en se
Inspection Area:			
1. Sketch o	or attach photographs t	o provide documentation or additional details	as necessary.
(D	Buttress 3	
	-		
·			
r .			
			*
Comments:			
() Cracki (2) Embe	ing and grout	degradation @ construct away from face of conc	crete
QC Inspector:	Par	Level: T	
-	<u> </u>		$L \text{Date:} \frac{\sqrt{2/3}}{3}$



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CONCRETE EXTERIOR DATA SHEET SQ 8.4 09/03/13 Page 1 of 1 Revision 0

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<u>OTH</u> Year 2013 Surface Condition NI IO RI # embed plates #
Surface Condition NI IO RI * IO IO
NI IO RI
NI IO RI
NI IO RI
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report any Recordable Indication (RI) or Information Only se of documentation and orientation.)
be Examined For (PSC Procedure 8.4)
Deterioration of any Concrete Coating (if applicable)
Tendon Grease on Exposed Concrete Surfaces
Corrosion on Grease Cans, Bearing Plates or Anchorage
*Excessive Corrosion on Exposed Embedded Metal Surfaces
*Detached Embedments or Loose Bolting
*Indication of Degradation Due to Vibration
(* The owner/agent must be notified for these noted conditions.)
Conceptione Contractione
11/15 Date: 1/13/13
2E/ Date: 19 Fea 14
Date: 4/15/14

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CONCRETE EXTERIOR DATA SHEET SQ 8.4 09/03/13 Page 1 of A Revision 0

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VISUAL EXAMINATION - GENERAL VISUAL EXAMINATION			
Project TMI UNIT Surveillance # 40TH Year 2013	and a second	C. Statistics of the Control of the	
Inspection Area: Buttress 4 and adjacentareas (Easto Wes	t sid	2 001	side
Equipment Used Tape measure; feeler gage F78 due cal 9/30/	14 0	ind.	
Test chart s/N OC 11-026	<u> </u>		
Concrete Surface Condition		ويتلفأ فتشتعون	****
Containment Surface (Findings and Description)	NI	10	DI
			RI
Degraded grout patches @ construction seam ()	┈┝═┥╌		
Embed plate Plaking			
Degraded grout patches @ embed plates O			
Embed plates pulled away from face of concrete D			
Face of ring girder has random / intermittent			
Scaling / Spalling of concrete and grout			
- senting praining of concrete energing	╼┾═╡╼╸		┟╌╞╦╉╴
			┝╸╞═┫╌
Tat lare to a first the training	┝╌╞═╉╴	┼╌╞═┥╌╴	┟┈╞═┫╴
Initial examination was performed remotely with		┝┝╧┥╸	
the aid of binoculars, Locations requiring			
direct VT-IC were performed on suspect			
locations as noted above,			
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	┼╌╞╦╦┽╾	┽╍╞═┽╸	┥╌┝═╡╴
	ليليل	<u></u>	
(Use as many sketch sheets (page 2) as needed to report any Recordable Indication (RI) of	r Infor	mation	Only
(IO) findings for the purpose of documentation and orientation.)	-		
Recordable Indications to be Examined For (PSC Procedure 8.4)			
Leaching or Chemical Attack Deterioration of any Concrete Coating (if applicat	le)		
Abrasion or Erosion Degradation Tendon Grease on Exposed Concrete Surfaces			
Popouts and Voids Corrosion on Grease Cans, Bearing Plates or Anci		_	
Cracks *Excessive Corrosion on Exposed Embedded M	etal Surf	aces	
Scaling *Detached Embedments or Loose Bolting			
Spalls *Indication of Degradation Due to Vibration			. .
Corrosion Staining on the Concrete Surface (* The owner/agent must be notified for these r Exposed Beinforcing Steel	INCEG CO	naitions.)
Exposed Reinforcing Steel Surface Patches or Repairs	si	~	
	acceptab		-
		LUNT	Ind
COMMONY MADEN IN A ISSUEVING PULLARS GRAMINATION			VI.
Inspector & Level: Date: 12 Date: 12	121	19	
	12/		
Responsible Engineer: Date: 19	<u>rsß [</u>	4	
ANII: Date: 4/	5/14	· · · · ·	
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Project:	TMI 2013 40TH	EAR TENDON SUR	VEILLANCE		444		
inspection Area:	Buttre						-
1. Sketch or	attach photograp	hs to provide docume	intation or additiona	I dotoile co macon		1999 di star ili ili districta di la contra	
		Buttress			isary.	<u>17-1866 - 1</u>	
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		from face	3 Embec	flaking			
Comments:	1	INNI THE			** <i>=-=</i>		
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	D-nA	<u>A</u>					
QC Inspector:	Eonald	a Pr	Level:	<u> </u>	Date:	12/3/13	
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VISUAL EXAMINATION -	- GENERAL VISUAL EXAMINATION		interio de la comercia			
Project TMI UNIT I Surveillance #	40TH Year 2013			بينداذ ارتعاريفا كالبريد		
Inspection Area: <u>Containment tendons - Buttress 5</u> (outside)						
Equipment Used Binoculars		×				
	te Surface Condition					
Containment Surface (Findings and Description)		NI	10	RI		
Buttress 5 face is inaccessibil	e due to ventilation					
Stack	· · · · · · · · · · · · · · · · · · ·					
Small cracks noted < 0,010 in	, width					
Degraded grout patches	· · · · · · · · · · · · · · · · · · ·					
Minor oil stains						
Small buy holes						
Exposed embed plates with slight	toxidation Ino degradation					
noted.	CPOLICON JUL SCALLOWING					
/101 CD .		┼╌┢═┥╴	<u></u> ┨╌╞═╬╴	┼╍┢═╉╴		
Alata Carltan a metal	We An Angelia walk	┝┝╤┥╴	╉╾╞═╬╾	┼─╞═╋╴		
Note, conditions holed	were previously rent changes noted.	┼┈┝═┽╌	┾╞═╉╴	┼╾┝═╡╴		
<u> </u>	rent changes noted.	┾╌┝═╉╾	┼╌┝╾┥╴	╁╌┢═╉╴		
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			┼╌┢═┢╴	┝┝┛╴		
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		\Box				
(Use as many sketch sheets (page 2) as needed		r Infor	mation	Only		
	pose of documentation and orientation.)					
	to be Examined For (PSC Procedure 8.4)					
Leaching or Chemical Attack	Deterioration of any Concrete Coating (If applical	ble)				
Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surfaces	homan				
Popouts and Voids Cracks	Corrosion on Grease Cans, Bearing Plates or And *Excessive Corrosion on Exposed Embedded M	norage etal Suri	Aces			
Scaling	*Detached Embedments or Loose Bolting	clai Juli	10000			
Spalls	*Indication of Degradation Due to Vibration					
Corrosion Staining on the Concrete Surface	(* The owner/agent must be notified for these	noted co	nditions	.)		
Exposed Reinforcing Steel				•		
Surface Patches or Repairs						
Comments and Disposition by Responsible Engineer	Acceptable Un	acceptab	le			
Comments:						
Inspector & Level:	1 II Date: /	2/31/	13			
Responsible Engineer	1 C.E. Date: 19	FER	14			
ANII:	Date: 4	istic				
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Procedure: SQ 8.4 Rev 0



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VISUAL EXAMINATION - GENER	AL VISUAL EXAMINATION		-0.803			10-011122	Ì
Project <u>TMI (Luit]</u> Surveillance # 40TH	(ear		متهدين	operios:		<u>tar airin</u>	
Inspection Area: <u>Buttress</u> 6 (outside) Equipment Used <u>Binoculars</u>						<u></u>	
Equipment Osed D/AOCOTAVS	<u></u>		-				
Concrete Surface	Condition	a initia initi Ny fisia initia		ianapa)			
Containment Surface (Findings and Description)	· ·]	VI		IO		RI
- Hairline cracks]	_			
- Minor bugholes and popouts							
- Degraded grout patches	×						
- Abandoned expansion anchor	15						
				<u> </u>		\Box	\Box
+ Previously reported		Π					
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(Use as many sketch sheets (page 2) as needed to report a	ny Recordable Indication (RI) o	r I	nfo	rma	ition	0	ily
(10) findings for the purpose of do			_				
Recordable Indications to be Exam	ined For (PSC Procedure 8.4)					-	
	tion of any Concrete Coating (if applica	ble)					
	Brease on Exposed Concrete Surfaces						
	n on Grease Cans, Bearing Plates or And ve Corrosion on Exposed Embedded M			fac	74		
	ed Embedments or Loose Bolting	cla.	00	140	-3		
	on of Degradation Due to Vibration						
	wner/agent must be notified for these	not	ed c	ond	itlqn	s.)	
Exposed Reinforcing Steel							
Surface Patches or Repairs Comments and Disposition by Responsible Engineer	Acceptable Un	100 0		bla			
Comments:	Jan Acceptable []01	acc	epta	UIC			
	<u></u>						
\square	7						
Inspector & Level: A Part	IF Date: 111	12	Ti	٦			
Responsible Engineer: 2 August 12.	Date:	>		R)	TV.		
ANII: XOLUL	Date:	15	14		-+-		
							
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	- GENERAL VISUAL EXAMINATION		ti strat y Tit <u>s</u> — .	
Project TMI LIN: + / Surveillance #	40TH Year 2013		an a	
Inspection Area: <u>Between Butt</u>	ress 2 and 1			
Equipment Used <u>Binoculars</u> ; Te	st Chart SN OC11-026			
	rete Surface Condition			
Containment Surface (Findings and Description).		NI	-10	RI
Degraded grout patche	ويستقينها والمنافعة ويستثنيا المحادقين المتعصينة الأكاف فتستجد والمؤوج ففتنتهم والمتكافية والمتعاقل والمتكافي فالمتكافي والمتعادي والمتعاد			
Hairline Cracks	<u> </u>			
Poports and hugholes				
Very Slight Spalling @ e	abed states #			
Slight leeching effor	escente 7			
Exposed embed plat	e *			
· · · · · · · · ·				
* These conditions were	Previously reported			
and remain essentially	the same			
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	مەرىپىيىرىغى بىت ئىيىنىغىنى ئىلىغىن بىلىك تەكەر يەرىپىيىنىيەت تەكەپ يېرىپىغى تەكەپ يېرىپىيە تەكەپ تىك تەكەپ تە يېرىپىيىرىغى بىت ئىيىنى بىلىغىن بىلىغىن بىلىغىن بىلىغىن بىلىغىن بىلىغان يېرىپىغى تەكەپ يېرىپىيە تىك ئىلىغىن بىل		┼┾╡╌	┝╌╞═┽╴
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(Use as many sketch sheets (page 2) as needed (IO) findings for the put	d to report any Recordable Indication (RI) prose of documentation and orientation.)	or Infor	mation	Only
Recordable Indication	s to be Examined For (PSC Procedure 8.4)			
Leaching or Chemical Attack	Deterioration of any Concrete Coating (if applic	able)		
Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surfaces			
Popouts and Voids	Corrosion on Grease Cans, Bearing Plates or Ar			
Cracks Scaling	*Excessive Corrosion on Exposed Embedded I	vietal Surf	aces	
Spalls	*Detached Embedments or Loose Bolting *Indication of Degradation Due to Vibration			
Corrosion Staining on the Concrete Surface	(* The owner/agent must be notified for these	e noted co	nditions.)
Exposed Reinforcing Steel				•
Surface Patches or Repairs				
Comments and Disposition by Responsible Engineer		nacceptab	le	
Comments:				
for the second second		t at		
Inspector & Level:	Date: /	115/1	3	
Responsible Engineer:	<u>C.K.</u> Date: 2	<u>† FER (</u>	14_	
ANII: Kreen it	Date:	4/15/14	, 	
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VISUAL EXAMINATION	- GENERAL VISUAL	EXAMINATION					<u></u>	
Project TMI UNIT! Surveillance #	40TH Year 201	13		a and a constant of the			<u>alandı inşerin</u>	-
		vtside)						
Equipment Used Binoculars ! Test		11-026						
Concre	te Surface Condition						Alexy gardenication	
Containment Surface (Findings and Description)			1	NI		10	R	U I
Hairline cracks	×							\square
Exposed embed plate	*		ſ				ΤĽ	\Box
	rescence #	-	Ţ		Π		TC	П
Grout patches degraded	بر		Ī		T			
Spalling @ embed plate	الازار فالمتراف المساوي بيوان فبرنج والمتبالا فالمتحد المتعاد والمسود فبسبط التكر كالا		Ť		Τ			
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* Previously reported	Constraine in	2		-	+-	┣╡-	┼╌┾	╤┥╌┥
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essentially the sa	me			╞═┽╴	+-	누	╍┼╍┾	
	·····	<u></u>			_	┢═┪╴	╌┼╌╞	━
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(Use as many sketch sheets (page 2) as needed			r II	nfoi	rma	ttion	ı On	ly
(IO) findings for the pur						-		
	to be Examined For (PSC P						و فدل او معاد ا	and the state of the
Leaching or Chemical Attack	Deterioration of any Concr		ole)			•		
Abrasion or Erosion Degradation Popouts and Voids	Tendon Grease on Exposed Corrosion on Grease Cans,							
Cracks	*Excessive Corrosion on I				face	26		
Scaling	*Detached Embedments o							
Spails	*Indication of Degradation							
Corrosion Staining on the Concrete Surface	(* The owner/agent must	be notified for these r	iot	ed c	ond	ition	s.)	
Exposed Reinforcing Steel								
Surface Patches or Repairs	وفرغ بجبوه بنشين بمعنات بمسبوب ببجاهيه أنامها كالمشافات	Standard Laboration	-		1.1.			
Comments and Disposition by Responsible Engineer		Acceptable Uni	acc	epta	DIE			
Comments:	<u>است ب را از است رو میکور م</u>							
<u> </u>	<u> </u>							
Inspector & Level:	Unt I	Date: //	7		7.	>		an she maka k
	TI	Date: <u>//</u>	4	2/	- Ti	<u>,</u>		
Responsible Engineer		Date: 4	7		4			
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VISUAL EXAMINATION - GENERAL VISUAL EXAMINATION	V		
Project <u>TMI Unit /</u> Surveillance # 40TH Year 2013 Inspection Area: Between Bottness 3-4 outside	Slimen (koyali - y Arihik in 1	Selang Constitutions	
Equipment Used 31.10Culars		<u> </u>	
Concrete Surface Condition	Distanti di Superiori d	a a a a a a a a a a a a a a a a a a a	
Containment Surface (Findings and Description)	NI	10	RI
-Hairline crecting			
- Category A corrosion of embed plates			
- Expessed expansion anchors - abandoned			
- Degraded avout Patches *			┝╼╞═┥╌
- Minor Depouts/ bugholes			┝┾╤╉╌
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Unchanged from previous report		┼╌╞═┩╌	┝╍╞═╍┥╌
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La Paris and a fait	╍┥╼┢═┽╸	┼╌╞═┥╴	┼╌┝═┽┈
* Previously reported		┼╍╬═┟╴	┼╍┢═┥╌
		┢┝╋┥	┟┈┝╼┟╴
(Use as many sketch sheets (page 2) as needed to report any Recordable Indication (RI (IO) findings for the purpose of documentation and orientation.)		mation	Only
Recordable Indications to be Examined For (PSC Procedure 8.4)			
Leaching or Chemical Attack Deterioration of any Concrete Coating (if appl	icable)		
Abrasion or Erosion Degradation Tendon Grease on Exposed Concrete Surfaces			
Popouts and Voids Corrosion on Grease Cans, Bearing Plates or A	Inchorage		
Cracks *Excessive Corrosion on Exposed Embedded	Metal Surf	laces	
Scaling *Detached Embedments or Loose Bolting			
Spalls *Indication of Degradation Due to Vibration Corrosion Staining on the Concrete Surface (* The owner/agent must be notified for the	so noted as	nditiona	、
Exposed Reinforcing Steel	se noteu co	10110112)
Surface Patches or Repairs	1		
Comments and Disposition by Responsible Engineer	Unacceptab	le	يأمان أكري الإستراديات الأربيبية
Comments:	_		
		والإرب البراد الم	
Inspector & Level: Carpen II Date:	11/13/1	3	
Responsible Engineer: Date: Date:	9' Fee	14	
ANII: Debut at Date:	4/15/14		
	-		
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VISUAL EXAMINATION – GENERAL VISUAL EXAMINATION						
Project <u>TMI Unit 1</u> Surveillance # 40TH Year 2013 nspection Area: <u>Between Buttress 4-5 (outside</u>) Equipment Used <u>Binoculars</u>				•••••••••••		••••••••••••••
Concrete Surface Condition	فليتي فأرجد				-	الا توريد فخف معاد
Containment Surface (Findings and Description)	L P	11	T	O	<u> </u>	RI
	┝─╆				┉┝╾	
Hairline cracks	┼╌┡	- 12	+	-	┿	┢╧┽╌
Degraded grout patches *		-	+-	1	+	┢╧┥╌
Slight keching left lorescence +	┝╌╞					
Minor popouts / bugholes					_	
Category A cotrosion on Embed plates						\Box
- Fracks above Fuel handling bldg remain						
Unchanged from previous reports		Т	Γ			
	T			Π	Τ	T
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REP-1098-510 Appendix J, Page 15 of 70 PRECISION SURVEILLANCE PAGE 1	٥F.		ICRE ATA	SHE	ET 09 Page	SQ 9/03	8.4 /13 of 7	R. 3
VISUAL EXAMINATION - GENERAL VISUAL EXAMINA	TION		vТ		<u>IC</u>	R igger (
Project <u>TMI Unit I</u> Surveillance # 40TH Year 2013 Inspection Area: <u>Containment between Buttress 5 + 6 (outs</u> Equipment Used <u>natural lighting</u> , <u>Camera</u> , Test chart SN OCI	side I-c) 26		·	· · ·			
Concrete Surface Condition							and the second	1
Containment Surface (Findings and Description)			NE	1	0	T	RI	1
Hairline cracks						Π		1
Abandoned expansion anchors with Category A corros	on							1
Embed plates that are exposed to the Environment		\square		Π	й.	Π		1
exhibit category A corrosion								1
Small bugholes								1
Grout patches Trepair areas exhibit continued degra	date	1						1
which was previously reported				TÌ				1
Embed plates are detached - not flush with conc	cre.T	1		Π				1
surface,				T				1
Grout patch over equipment opening remains					16			1
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Exposed Reinforcing Steel Surface Patches or Repairs	e B	660	ม	-	۱			
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Page 2 oF 3

O SGR construction repair patch is coated with a shiny curing compound which is transparent and does not interfere / prohibit 100% examination. All other concrete surfaces are not coated. Condition remains unchanged.

- (a) Embed plate (vertical) that is 4"wide and 2'feet from west side of Buttress 5 has the following condition css;
 - a) 7 tendons down from top the embed plate is pulled away from the face of the containment wall approx 1/4" concrete has spalled on the Left hand side of the embed plate.

b) 13 tendons down from top - repair patch is spalling 9"L × 5"w × 1/2" D.

- c) 21 tendons down from top the embed plate has pulled away from the concrete face approx. 14".
- 3 Crack just below ring girder is 7"x 2"x "" ""
- (4) spalled area . noted = 1/2" in depth
- S Vertical embed plate that is 4"wide and 2'feet from east side of Buttress 6, the following conditions are noted!
 a) one location-embed plate concrete has degraded on Rtside. and cracks at repair area noted.

Dand location - cracking/spalling of repair area@ embed plate. c) 31d location - embed plate has pulled away from face of concrete - concrete has separated from embed plate.

d) 4th location - concrete has separated from embed plateand embed plate is not flush with face of concrete. e) 5th location - repair patch cracking and concrete separated from en beobicay Refert # 3 Attachment 2 Page 934 of 1008

Page 3 of 3

- f) 6th location concrete has separated from embed plate and embed plate is not flush with concrete surface.
- g) 7th location concrete has separated from embed plate and embed plate is not flush with face of concrete.

General Observations: Previously reported a) hair cracks Dabandoned expansion anchors have Category A corrosion i) Embed plates that are exposed to the environment have Category A corrosion. d) Grout patches / repair areas exhibit continued degrading e) small bug holes These conditions have been previously reported. Note: Outside the scope of ASME Section X) TWES a) Meteorological / electrical boxes exhibit significant degradation (material loss due to weathering) and provide 40 Rup little to no protection.



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roject TMI <i>init /</i> Surveillance # 40TH Year 2013			, and				
nspection Area: Between Buttress Tandb (outside)							
Equipment Used Binoculars; Test Chant SN OC11-026							
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Containment Surface (Findings and Description)		NI]	Ò	Γ	RI
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Degraded grout patches +							
Popouts and bugholes - minior *							
Abandoned expansion anchors *							
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CONCRETE EXTERIOR DATA SHEET SQ 8.4 09/03/13 Page 1 of 1 Revision 0

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Project <u>TMI</u> <u>(1,w, F1</u> Surveilla Inspection Area: <u>Behind</u> <u>Missle</u> Equipment Used <u>Binoculars</u> , test				
	Concrete Surface Condition	and the state of the second state of the second	, 1997 - 1997 - 1997 - 19 97 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997	
Containment Surface (Findings and Description		I NI	10	T
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	and have		- 麣-	┼╌
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Minon leeching / effloresce	ALE IN Several TOCA. TOAS			┢
Bugholes and popouts	(minor) minor at several locations			╋
Spalls and scaling	MINON a Several TOCATIONS	───┤ ┾═┽┈		+
Degraded grout pati	hes (minor)	<u>───</u> ┟╍┢┉┫╌	幽	┿
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	he purpose of documentation and orientatio			
	cations to be Examined For (PSC Procedure 8.4)			
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Inspector & Level: L. C.				
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REP-1098-510 Appendix J, Page 21 of 70 PRECISION SURVEILLANCE Page 1 oF		SHEET	
VISUAL EXAMINATION - GENERAL VISUAL EXAMINATION	J		
Project <u>TMI</u> Surveillance # 40TH Year <u>2013</u> Inspection Area: <u>Turkine</u> <u>Bldg</u> <u>Elevations</u> <u>305</u> , <u>322</u> , <u>338</u> , Equipment Used <u>Flashlight</u> , <u>light a Hacked to hard hat</u> , <u>bea</u> <u>and binoculars</u> , <u>Test chart</u> <u>SN OCII-02</u>	355' <u>(on</u> 1 6	38 9ht	o' ()
Concrete Surface Condition	-		
Containment Surface (Findings and Description)	NI	<u>IO</u>	RI
See attached pages for specific details.			
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Comments and Disposition by Responsible Engineer			-
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Inspector & Level: Responsible Engineer: ANII:	11/12 9 Fee 115/14	43	ng pang kang kang kang kang kang kang kang k
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Page 2 oF 6

() This examination was performed from floors, roots, platforms, walkways, ladders and other permanent vantage points. This examination was performed on 11/4/13 through 11/8/13, specific examination results are provided where rooms are identified on the doorway, otherwise general area comments are provided.

Note: In all instances the conditions noted / observed are reported as "Information Only." No "Reportable Indications" (RI) were noted.

 281 Elevation - Door <u>I</u> - 10\$7 ^{Rapo} illiplis
 a) Walls are painted - minor chipping
 b) abandoned expansion anchors
 G) grout repairs

= 281' Elevation - Door I-108 a) Walls are painted b) Popouts/bugholes (minor) c) 6 abandoned concrete expansion anchors

Page 3 OF 6

=281' Elevation - Door I-104 a) walls painted c) minor bugholes ~ 281' Elevation @ ladder beside Buttress #1 a) epoxy repair patch behind ladder 9"x9" b) popouts and bugholes (minor) = 322' Elevation - Room I-204 a) hair line cracks, minor bugholes and popouts b) very minor leeching / efflorescence d) 3 abandoned expansion anchors holes = 322 Elevation - Room I-203 a) minor popouts and bugholes b) 3 abandoned expansion anchors c) grout patch repairs d) pipe = 3/4" diameter protruding from wall adjacent to junction box

Page 4 oF 6 098-510 Appendix J, Page 24 of 70 = 322' Elevation - room east of Buttress #1 a) minor popouts and bugholes b) = 3/4" pipe protruding from concrete c) hairline cracks adjacent to Buttness #1 d) oil/grease on Buttness@tendons-not on containment wall. = 322' Elevation - Buttness#1 a) minor popouts and bugholes b) construction seams = 322' Elevation west side of Bottness #1 (Room I-202) a) minor bug holes b) hair line cracks c) construction seams 2 322' Elevation - Room I - 202 between Buttness land 2 a) oil/grease on Buttress I west side and not on containment wall b) minor hairline cracks c) leeching / efflorescence 1 foot from Buttress #1 wall d) grout repair patches e) 2 abandoned expansion anchors f) 3/4" pipe protruding = 4" out from wall face g) minor bug holes and popouts Topical Report 213 Attachment 2 Page 942

Page 5 oF 6

REP-1098-510 Appendix J, Page 25 of 70 = 322' Elevation - Room east of I-202 a) minor popouts and bugboles a) minor bugboles b) bottom portion of well painted = 13" = 357' Elevation a) grout patches b) Popouts and bugholes =357' Elevation - and room west of I-202 a) hair line cracks b) bugholes gvery minor leeching/ efflorescence = 357' Elevation - West side of Buttress #6 a) minor popouts and bugholes

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General observations of areas that are not clearly | specifically defined - all elevations - Turbine Bldg,

a) hair line cracks b) abandoned expansion anchors c) minor leeching / efflorescence d) minor popouts and bugholes e) grout and epoxy patches

Note! All conditions noted are acceptable. These are being reported as "Information Only"



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	VISUAL EXAMINATION - GENERAL VISUAL EXAMINATION					
Project TMI Surveillance # 40TH Year 2013						
	Inspection Area: Tendon Gallery = 253' elevation - 360° around					
		erd	sh			
	0611-026					
	Concrete Surface Condition					
	Containment Surface (Findings and Description)	NI	IO	RI		
W	Leeching / efflorescence (here) noted in two locations.					
	Pictures included in report. Stalactites noted at inter -					
_	face between ceiling and wall.					
O	Exposed rebar noted @ V-143 and V-149 (V-150) location					
	This was previously reported.					
3	Two cavity repairs by epoxy noted @ V-149 and V-150					
	location, Epoxy repair is not flush with face of concrete					
أير	One - 7/2"L × 1/2"W - Two - 21/2" × 21/2"					
Θ	Hairline cracks, minor buy holes and popputs noted which	П				
_	were previously noted.					
\mathfrak{G}	Minor I medium leaching / efflorescence noted randomly					
	360°. This was previously reported. This is on					
<u>_</u>	inner and outer wall,					
\bigcirc	Exposed embed plate adjacent to V-113 is pitted 20.010	T		111		
	deep.	Th,	T TT			
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	Corrosion Staining on the Concrete Surface (* The owner/agent must be notified for these n	oted co	nditions.)		
	Exposed Reinforcing Steel			•		
	Surface Patches or Repairs					
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PRECISION SURVEIL LANCE	Page 1	0 F_4		Page	a 1 of
VISUAL EXAMINATION -	GENERAL VISUAL EXA	AMINATION]		
ction Area: Cont. Bldg Alligator	0TH Year <u>2013</u> P.H. approx 273'				
hard hat; Test ch			tached	1 18	
	Surface Condition	ويتجارب والمراجع المراجع والمراجع والمراجع والمراجع		a construction of the same	-
ainment Surface (Findings and Description)			NI	0	RI

	see allachments for specifics			8		
Popouts, Voids, buy holes - se	e attachments for specifics					
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Oil leeching thru concrete - se		╞╡╴				4-1
Tendon grease on concrete surtac		┶╧┶	<u> </u>	쳺니	┶	
Achandoned expansion anchors	- see attachments for specifics				Ľ	
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	to be Examined For (PSC Procedure 8.4)		a de la come		, NG INCOMENTING	
Leaching or Chemical Attack	Deterioration of any Concrete Coating (if applicable	;)				
Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surfaces					
Popouts and Voids	Corrosion on Grease Cans, Bearing Plates or Ancho					
Cracks	*Excessive Corrosion on Exposed Embedded Meta	al Sur	faces			
Scaling	*Detached Embedments or Loose Bolting					
Spalls	*Indication of Degradation Due to Vibration					
Corrosion Staining on the Concrete Surface	(* The owner/agent must be notified for these not	ted co	onditi	ons.)	ı.	
Exposed Reinforcing Steel						
Surface Patches or Repairs				ومفادر الإلاحداد	<u>_</u>	
Comments and Disposition by Responsible Engineer	Acceptable Unac	ceptat	ble		1	
Comments:						
	2					
Inspector & Level: K & A - K	Date: 1/	75	11	3		
	Date: 19	Con	TIL			1
ANII:	Date: 4/12		17	•		
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						8

20 SQ 8.4.TMI.13 ISI

Page 2 oF 4 REP-1098-510 Appendix J, Page 29 of 70 ER-AA-335-019 D wall is printed approx. 11" from floor. 3 At Buttress 1 - bugholes, an Il" grout petch, and grease was noted on the wall adjacent to the tendons. 3) The following conditions were noted between Buttness 1 and 6: a) hair line cracks approx 5ft Bastof Azimuth 0° Bhairline cracks 2ft east Azimuth 0° Q A cavity 3"L x 1/2" w x 1/8" d @ AZIM th 350" d) hair line cracks between Azimuth 350° and 340° were leeching oil e) hairline cracks close to Azimuth 340° was noted as leeching / efflorescence. f) hairline cracks 5ft east of Azimuth 340° leeching oil. g) Approx 1 cup of oil noted on floor. h) hair line cracks leeching oil 1 ft west of Azimuth 330°. (1) The following conditions were noted @ Buttress 6: a) hairline cracks, buy holes and popouts b) Twenty-one (21) abandoned expansion anchors were abandoned, one has bolting the hole. These are aligned 8, 6 and 7 progressing west to east. One cavity, 31/2" × 31/2" × 2"d appears to be an abandoned expansion anchor. 5) The following conditions were noted between Buttiess 6 and 5. below a) leeching / efflorescence 7' west of Azimuth 310° above electrical conduit mounted on well. 11/4/13 b) hair line cracks located @ Azimuth 300° and east there of have 4 rows of leeching oil, Three are dry and one is wet, Topical Report 213 Attachment 2 Page 947 of 1008

ER-AA-335-019 (5) Continued c) Hairline cracks noted @ Azimuth 290"- two have oil (wet) leeching thru the wall. The other hair line crack the all is dry. (6) Buttress 5 had the following conditions! a) Minor hairline cracks < 0,010 and very minor leeching / efflorescence noted. b) Oil/grease noted on wall and grease cap. (7) Between Bottress 5 and 4 the following conditions were noted! a) Hairline cracks 60,010 and very minor leeching/ efflorescence. (8) Bottress 1- the following conditions were noted: a) minor bug holes b) At Azimuth 40° white stains were observed emanating from a galvanized angle iron support (Into only) c) very minor leeching/efflorescence noted approx 20" west side of tendons (between Bottress I and 2) d) Hainline cracks leeching oil thru concrete noted 5' east of Azimuth 40° e) Approx. 15 expansion anchors abandoned@ Azimuth 60" f) Dry and wet oil leeching thru concrete was noted @ Azimuth 600 9) Six (6) abundoned expension anchor holes have been grouted.

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Page 3 of 4

REP-1098-510 Appendix J, Page 31 of 70

Page 4 oF 4 ER-AA-335-019

(a) conditions noted @ Buttress 2 a) very minor bugholes b) wet oil noted on grease caps and well D conditions noted & between Buttress 2 and 3: a) minor popoints and buy holes b) hair line cracks 2 0.010 noted @ Azimuths 90% 100°; and 110°. Three were noted as having wet oil leeching thru concrete; the other has dry oil. (Conditions noted @ Buttress 3: a) bugholes b) one grout patch c) two cavities (just west of Buttress 3); one cavity 3×3/8"×1/4"; the other 3"×1"×1/5".

Note: All the conditions noted above were previously reported and no apparent changes have occurred, REP-1098-510 Appendix J, Page 32 of 70



Project TMI Un; t Surveillance #	- GENERAL VISUAL EXAMINATION 40TH Year 2013	ter an	<u>an ya ma</u> ng di Sangan	
Project <u>TMI Unit</u> Surveillance # nspection Area: Blest side of But	TAALC 2 - ING alow Aux	RIJ	a .	
nspection Area: <u>Blest side of But</u>	Tress 3 - 305 elev Aux est chart s/N OC11-026	$-\rho_{14}$	<i>9.i</i>	
Equipment Used <u>flashlight and Te</u>	ST CHART STO OCTI V26	. <u> </u>		
Concre	te Surface Condition			
Containment Surface (Findings and Description)	an a	NI	10	RI
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CONCRETE EXTERIOR DATA SHEET SQ 8.4 09/03/13 Page 1 of 1 Revision 0

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VISUAL EXAMINATION - GENERAL V			126 <u>0-0-0</u> 04	
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Project <u>TMI Unit</u> Surveillance # 40TH Year Inspection Area: <u>Buttress 4 Westside</u> Hu Equipment Used <u>Flash light and Test char</u>	+ Bldg 305'2	1011		
Equipment Used Flash light and Test char	F SIN OCH- 02	16	·	
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Concrete Surface Cond	ition			
Containment Surface (Findings and Description)		NI	10	RI
Minor brown staining				
Construction seams	·····			
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CONCRETE EXTERIOR DATA SHEET SQ 8.4 09/03/13 Page 1 of 1 Revision 0

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VISUAL EXAMINATION - GENERAL VISUAL EXAMINATION	an a			, San Maria	فسيتعتق		
Project <u>TMI [1 & T]</u> Surveillance # <u>40TH</u> Year <u>2013</u>		-					
nspection Area: Buttness 4 281 elev both sides accessible							·····
Equipment Used <u>Flashlight and Test Chart shu oc11-026</u>							
Concrete Surface Condition	****				Nation young		
Containment Surface (Findings and Description)	1	11	Ι	IC		F	ય
Construction segms							
Minor leeching / efflorescence on wall					the second s		
Abandoned expansion anchor holes	Π	Ţ					ך
Abandoned expansion anchors	Π		Τ	ġ		Π	
				Ľ		П	
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Note: Buttress not painted - Containment	1÷ř	-	+	T	┭	<u>†</u> −†	7
walls are painted. Examination limited	11	-	-[-	Ť	┭	1 T	-
due to Diping, Conduit, which boxes etc		-	+		4	Ħ	-
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Recordable Indications to be Examined For (PSC Procedure 8.4)							
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Abrasion or Erosion Degradation Tendon Grease on Exposed Concrete Surfaces							
Popouts and Voids Corrosion on Grease Cans, Bearing Plates or And							
Cracks *Excessive Corrosion on Exposed Embedded M	letal	Su	ur fac	ces			
Scaling *Detached Embedments or Loose Bolting							'
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			-Viii		01130	,	
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Surface Patches or Repairs Comments and Disposition by Responsible Engineer Comments: Inspector & Level: Responsible Engineer: Date: 1 Date: 1 Date: 1			t 1 8 15	314	<u> </u>	Rendi	

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ATTACHMENT 4 ASINE IV/L (Class CC) Containment Concrete Detailed or General Visual Examination

			Page 1 of 2 12/3/13
Station: T.M.I		n l	Init: / Date: 12/3/13 Report No:
System: Tendon's Compon	ient 1		ress 3 (outside) WO No(s): R2193606
Location: Building: Cont.	Etev.:	MA	
Exam Type: Detailed Visual			
K General Visual	() (She ou	Craint	Remote Mail. Type: Concrete
Design Drawing(s) TMI ~0	OIN TI		Visual Aids: Test Chart SN OC11-026,
Surface: D OD D ID	<u> </u>		Surface / Components Coaled: YES IN NO
Infumination Used Natur		14	ig - Sunlight
ويستعدن والمديد والمنابع المنابع	RI NRI	lio	
Allribute	ra ara	The Action was all	Explanation / Comments
Cracks (Characterize and Size) Exposed Reinforcing Steel			Gracking at Construction seams
Exposed Metallic Items (Other)		┨╌╌┨	
Evidence Of Grease Leakege		<u> </u>	
Evidence Of Moisture	┼──┤───		
Leaching Or Chemical Attack		+	
Settlements Or Deflections			
Degraded Patches or Repairs			At Construction Seams
Papouls, Volds, Honaycamb			
Spalla			
Cold Joint Lines			
Concesion Staining			
Scaling / Dusting			
Coating Delerioration			
Abrasion, Cavitation, Wear			
Air Vaids / Bug Hales			
Efficiescence			
Other (Explain)			Embed plate pulled away from face of fonce
Results Legend: RI - Reco	deble ladic	-	NRI - No Recordable Indications IQ - Information Only
Supplemental Information :	Yes INO	, D	Skelch Photo Video Olher (Describe):
Examiner: <u><u><u><u></u></u><u><u><u></u><u></u><u><u></u><u></u><u></u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u></u></u></u></u>	<u>a 1</u>	in	Level: II Date: 12/3/13
Further Evaluation Required:	X Yes	ď	No
	•	Doci	UMENT ADDL. DETAIL AT GAREPRINE RI
			for Corrective Action) Suspect Areas shall be dispositioned by a Responsible Engineer
Reviewer 2 Mart	220		E. RESPONSIBLE ENGINEER Data: PJFGRAM
ANIE: Lawfit			Catex 4/5/14
L			
			Page 1 of 2 er formed remotely with the aid of binocul
I tal avaniat	inn WK	c /.	er hanned comptely with the aid of binocul

CONCRETE EXTERIOR SKETCH SHEET 8.4 09/03/13 2 0F Page X of X **Revision 0** Raf 12/3/ TMI 2013 40TH YEAR TENDON SURVEILLANCE Project: Buttness 2 Inspection Area: Sketch or attach photographs to provide documentation or additional details as necessary. 1. Buttress 3 (west side) H 13-055 3 H13-054 - H13-053 - H 13-052 Omments: Dicracking and grout degradation @ construction seam @ Embed is pulled away from face of concrete Comments: QC Inspector: Level: \mathcal{T} Date: 20 SQ 8.4.TMI.13 ISI

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

		Page 1 or			
Stallon: TML	and the second	<u>nit: / / </u>	Date: 11/14		
System: Conf. Company	ent Buttnes	<u>s 1</u> (0	utside)	WO No(s).	R2193606
Location: Building: Conti	EDAV .: NIA	- Col.:	UM ROW.	NA Azimuth/	Radius: 12/14
Exam Type: Detailed Visual	Type Of Exam	: Direct	Nonil Thursday	Concrete	
General Visual		Remote	Matil. Type:	Concrest	
Design Drawing(s) TmI-	0014/1	Visual Aids	Binocule	ers	
Surface: 💹 OD 🔲 ID		Surface / C	amponents Co	aled: 🗌 YES	NO
Humination Used Sunlig	ht / bino	culars.			
Attribute	RI NRI IO	inni lian ihan mini ninahikikini	Explana	tion / Comments	
Cracks (Characterize and Size)		Hairlin	ويتعصفني فتنزك الجليلة جليك بريكا والمكار	reviously ra	ported
Exposed Reinforcing Steel					
Exposed Mesallic Items (Other)					
Evidence Of Grease Leakege					
Evidence Of Molsture					
Leaching Or Chemical Attack			47 		
Settlements Or Deflections					in the second
Degraded Patches or Repairs			iously rej	ported	······································
Papouts Volds, Honeycomic		and bug	holes - m	1101 - AS PM	evious ly reporte
Spalla		At em	hed plat	tes - skahl	
Cold Joint Lines			<u> </u>		
Concision Staining					
Scaling / Dusting				ويتراف والمتحد المتحد والمتحد والمتحد والمحد	
Coaling Deterioration					
Abrasion, Cavilation, Wear					
Air Voids / Bug Holes		[······
Efforescence					
Other (Explain)		Abando	ned exp	ansion and	
;	dable Indication				
Supplemental Information :	Yas INNO	Skelch P	hoto 🗌 Vidao	Ditter (Describ	6):
Examiner: <u>R</u> Q	P	-7		Level:	Date: 11/15/13
Further Evaluation Required:	🛛 Yes 🕱	Na			
Additional Actions:	<u> </u>				
(Action Request, Work Onder, Int			Suspect Areas shill	be dispositioned by a Reep	ontible Engineer
Reviewer: Lacon	7.6.	E. R	<u>sponsible</u>	Grain EER	Date: / 9 Far M
ANIE: Seeul to				5-	Date: 4/15/14
in the second		_ 1 .	1		

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

An and the second s		Page 1 of 1				
Station: TMT	Աղ	it:	Date: 11/15	113	Report No:	
System: Tendens Compone	ent: Buttre	-SS 2			WO No(a) .:	R2193606
Location: Building: Cont.	Eler.: NIA-	Col. N	H ROWE	NA	Azimuth/R	scilus: N/17
Exam Type:] Detailed Visual	Type Of Exam:	Direct			مند به الکرار ، مرتبع از بی رو هم می از را ماند به ه	
General Visual		Remote	Mail. Type:	Co	ncrete	-
Design Drawing(s) TINT -		Visual Aids;	Binocu	lars		
Surface: 🕅 OD 🗍 ID	•	and the second se	mponents Co			NO
Mumination Used NaTur	ral lightin	a - Sun				Charles and the second s
	RI NRI IO	7		finn / C	mments	
Cracks (Charactesize and Size)		Hairlin			*	
Exposed Reinforcing Steel						
Exposed Metallic Items (Other)		Embed	plate	\$	*	
Evidence Of Grease Leakege			7			· · · · · · · · · · · · · · · · · · ·
Evidence Of Molsture		·····				
Leaching Or Chemical Atlack						
Settlements Or Deflections						
Degraded Patches or Repairs					·····	
Papaula) Vaids, Honaycomb		And byg	holes -	mino	<u>^</u>	ŧ
Scalls		·				
Cold Jaint Lines						
Contasian Staining						
Scaling / Dusling						
Caating Deterioration						
Abrasion, Cavitation, Wear						
Air Vaids / Bug Hales						
Efforescence		-71		<u> </u>	.	
Other (Explain)		<u>nbando</u>	ned ex	Pans	ion an	chors
	labla Indication Ni				- Information	
Supplemental Information :	res Kano 🔲 🗄	Sketch Ph	oto UVideo		ter (Describe	٤
Examiner:	a	Pag		_ Level:	I	Date: 11/15/13 - essentia
Further Evaluation Required:	1 Yes 12 N	va ×	Previousl,	y rej	oor ted	-essential
Additional Actions:		remain	the san	ne		
Action Request Work Onlect Stu						sible Engineer
Reviewer: 2/2 to	RE CE	CEST	ons rele h	ANG/M	sex.	Date: 19 68 14
ANII: Breufoto						Datex 4/15/14
L						
	•	Pageof	L			

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		NDE Report Page 1 of 1		
Station: TMI	······································	and the second	Date: ////8//3	
		Unit: /	ستكسب والأمام وتتباسي فتستنب فتت	Report No:
System: Francions Compone	nt Du	ottress 3	(outside)	WO NO(9) .: R215 3606
Location: Building: Cont.	Elev.: M	Int Cal: N/	A ROW. MA	Azimuth/Redius: A/19
Exam Type: 🔲 Detailed Visual	Type Of Exa	ım: 🗌 Direct 🔰	Watt. Type: C	oncrete
General Visual		Remote	ware Tabler	
Design Drawing(s) TMI-0	014/1	Visual Aids:	BINOCULO	
Surface: DO DD D		Surface / Con	ponents Coaled:	YES INO
Illumination Used Natu	ral ligh	nting - Sui	n light	
Attribute	RI NRI IC		Explenation / C	ammenta .
Cracks (Characterize and Size)		Hairli.	ne - previ	ously reported
Exposed Reinforcing Steel				
Exposed Metallic Items (Otiver)		Miner Cor	rosion@ e	mbed plates
Evidence Of Grease Leakage				
Evidence Of Molature				
Leaching Or Chemical Attack				
Settlements Or Deflections		SRM Z		
Degraded Patches or Repairs		AS previ	ously repo	
Popaute, Vaids, Honeycomb	 [19]	Minor pc	pouts/hi	igholes
Spalls	<u>}</u>		• ••••••••••••••••••••••••••••••••••••	/
Cold Joint Lines				
Corroston Staining				
Scaling / Dusting				
Casting Deterioration			<u></u>	
Abrasion, Cavitation, Wear				
Air Vaids / Bug Hales				
Efflorescence		Abanda	and an An	ation publicant
Other (Explain)	able Indication			<u>15/01 anchors</u>
Results Legend: RI-Record Supplemental Information : []Y		Sketch MPho		her (Describe):
Examiner: R Q	Pr		Level	and the
	U Yes	Na		
Additional Actions:	(j)			
(Action Request, Work Order, issue	Report, etc. Injiet	Stor Consetive Action) Si	spact Areas shall be dispos	itioned by a Responsible Engineer
Reviewer: Lalar			PONSALE EN	
ANIE: Steery H	Z		مناظر المرجب ورود عرب 	Date: 4/15/14
		Page of		

ATTACHMENT 4 ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Page 1 of 1											
Station: TMI			nit: 1	Date: 11/1		Report No:					
System: Tendons Compor	ent:	But	ttress 4	(outside	e)	WO No(s) .:	R2193606				
Location: Building: Cont.	Ete	N: N/A	7 Cal: A	IF ROWR	MA	Azimuth/R	scius: 4/2				
Exam Type: 🗌 Detailed Visual	Ту	pe Of Exam;	Direct	hand Trents	Co	ncreta	2				
General Visual		· · · ·	Remote	Mall. Type:			Y				
Design Drawing(s) TMI-0014/1 Visual Aids: Binoculars											
Surface: B OD D ID Surface / Components Coaled: VES B-NO											
Inumination Used Nati	iral	lighti	19- SU	nlight	·						
Attribute	RI	NRI IO		Éxplana	ition / Co	mments					
Cracks (Characterize and Size)			Hairlin	و							
Exposed Reinforcing Steel											
Exposed Metallic Items (Other)			Categor)	1 A Corr	osion	-emb.	ed plates				
Evidence Of Grease Leekage				•							
Evidence Of Moisture		·									
Leaching Or Chemical Attack											
Settlements Or Deflections				· · · · · · · · · · · · · · · · · · ·							
Degraded Patchas or Repairs			Previous	y repo	N Tec	7 Dennes					
Papaute, Vaids, Honeycomb	┝━━┡										
Spalis											
Cold Joint Lines	┝╼╌╀						and the second				
Canasian Steining											
Scaling / Dusting											
Coating Daterioration											
Abrasion, Cavitation, Wear					· · · · · · · · · · · · · · · · · · ·						
Air Voids / Bug Holes		<u></u>									
Efflorescence	┞╼╾┤		12 - 1-	1 .	44						
Other (Explain)			Bugho		nine	and the second	(D-h-				
			IRI-No Record Sketch []Ph			-Information					
Supplemental Information :			Skeich Linn								
Examiner:	1_	<u>/-</u>	y-		_ Level:		_ Data: 11/13/13				
Further Evaluation Required:		Yes 🕅	Na /				•				
Additional Actions:											
(Action Request, Work Order Live	ya Repa	n, etc. thistelad for		· •		- •					
Reviewer.	24	2.0	<u> </u>	PONSIBLE	· En	5/2 <i>G</i> C	Date: 12 Fer 14				
ANTE: Lacusta							Dates 4/15/14				
				······			`				

Page ____ of ____

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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination

	· · · ·		NDE Repoi Page 1 of:	t pap ra 12/3/1	3	,
ſ.	itation: TMI		Unit: /	Date: 12/3/13		1
-	الاستعادي والمتعا التثليات والمحجور وتقوي فالمتحج والمعاد ومبرد والمراجع والمتعاد والمحاد	Int Button	ss 4 and adju		WO No(3): \$2193606	
	ocation: Building: Cont.				/// Azimuth/Radius: N//	•
California (California)	xam Type: 🕅 Detailed Visual	a second s			ما مريخي في مكسوماً الأسمين <u>منه</u>ينا في الملك مسيرة عن من الملكما مريحاً من عرا من مركز المعالة . -	
L	🗡 🔲 General Visual		Ramola			
	Design Drawing(s) TMI-	0014/1	Visual Aids:	Test Chart	0611-026	<u> </u>
[Surface: 🔟 OD 🔲 ID				t: 🗋 YES 🧱 NO	
	lumination Used Natur	val light	Ting - SUNI	ght		
	Attribute	RI NRI IC	<u>)</u>	Explanation	I Comments	
	Cracks (Characterize and Size)				and a figure of the second	1
_	Exposed Reinforcing Steel					-
			Embed	spile tlak	ing	-
	Evidence Of Grease Leekege					
	Svidence Of Moisture					4
	Settlements Or Deflections					-1
	Degraded Patches or Repairs		am Birect Mail. Type: Concrete [Remote Visual Aids: Test Chart Ocil-026] Surface / Components Coaled: [] YES M NO ting ~ Sun light D Explanation / Comments Embed plate flaking At construction seams and enbed plate At construction seams and enbed plate And scaling at face of ring girder (rander) Embed plates pulled away from face of concrete a NRI-No Recordabie indicationa No-Information Only M Levei: Date: 12/3/13			
	Papoula, Valda, Konaycomb	At construction seams and earled plates agroups At construction seams and earled plates agroups Mear				
	Spalls		And Scal	ing at face	ofring girder (rando	[]
	Cald Joint Lines			7		
Ī	Comosion Staining					
	Scaling / Dusting					
	Coating Deteriorstion				و « المان « موجود المراسعين »	
-	Abrasion, Cavitation, Wear					. .
ļ	Alr Voids / Bug Holes				·····	
ļ	Efforescence					- to to
ł	Other (Explain)		I EMDED	pluies pul		of concrete
			and the second			
ļ	Supplemental Information : []	res LINO		TORO LIVIDEO L	Tower (mescuper	 }
	Examiner:	<u>a p</u>	in	L	evel: Date: 12/3//	3
ľ	Further Evaluation Required:	X Yes [] Na			1
	Additional Actions: NE-EXA	MMEDO	CUMENT AD	DL. DETAIL A	T ENGEP RATE RELS	
	(Action Request, Work Order, Iss	workepart, etc. tollier	est for Cerceotive Action)	Suspect Areas chail be d	ispanitaned by a Responsible Engineer	
	Reviewer:	22,	_ <u>P.E. , IX</u>	ESPONS POLLE	GNGINGER Data: 19 Fee	"4
	ANIE _ Steery M		» >		Date: 4/15/1	4
•			_ 1	2		
×	Initial examinat	ion was	performe	d remotely	y with the aid of T-IC were perf ove. RaRy 12/3,	f ,
}	onoculars, Loca	tions re	equining a	lirect, Vi	T-IC were perti	ormed
	on suspect area	:_topilalment	2037Afachment 2	Page store for	ove. Rapy 12/3,	113

PRECISION S	REP-1098-510 Appendix J, Page 42 of 70 DAyeil LANCE CONCRETE EXTERIOR SKETCH SHEET 8.4 09/03/13 Page 1 of 1 Revision 0	\$ 3 1
Project:	TMI 2013 40 TH YEAR TENDON SURVEILLANCE	
Inspection Area:	Buttress 4	-
Complete Survey of the State Survey of the State Survey of the State State State State State State State State		
1. Sketch or i	attach photographs to provide documentation or additional details as necessary.	
H24-05 H24-05 H24-5 H24-5 H24-5 H24-5 H24-5		- D
Comments:	iction seam cracks-degraded patches	\neg
(2) Embe	d protruding from face d flaking	
QC Inspector:	Rapy Level: II Date: 12/3/13	

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

			-	Page 1 of 1	فنسب والارد استرجب ومرود ومراجب والنزو	ار بالا دارين را در در بار من در در مرسو المر	
Station: TMI				nit: /		0/13 Report No:	
	ent	Conta	inn	ent Bld 7	Buttress 5	- WO No(s) .:	R2193606
Location: Building: Cont.	Ele	W.:	NIA	Cal.: A	A Row.	NA Azimuth/R	BOILUS: N/A
Exam Type: Detailed Visual	Ty	pe Of E	Xam	Diract	Real Trunes	Concrete	
General Visual		-		Remote	Matl. Type:	concre. e	
Design Drawing(s) TINI -	00	14/1		Visual Aids:	Binoc	ulars	
Surface: 🗰 OD 🔲 ID					mponents Co	aled: 🗋 YES	NO
Mumination Used Natur	nal	119	ht	ng - Sur	ilight		
Aitribute	Ri	NRI	10	/	Explana	tion / Comments	
Cracks (Characterize and Size)	1			Small C	racks n	oted <0.	,010
Exposed Reinforcing Steel				· _· _·			
Exposed Metallic Items (Other)				Exposed en	nbed pla	tes noted - m	inor or det
-Evidence Of Grease Leakage						no degry	dation
Evidence Of Molature						·	
Leaching Or Chemical Atlack	┝╼╼┥				مى باغانىك تەجمەر ايكان كا		
Settemants Or Deflections					,,		
Degraded Patches or Repairs				Grout Pat	tches de	gruded	
Papouls, Valds, Honeycomb						· · · · · · · · · · · · · · · · · · ·	
Spala						<u> </u>	+
Cold Jaint Lines				K EXa	m per	ormed ou	15,00
Conosion Staining					· · · · · · · · · · · · · · · · · · ·		
Scaling / Dusting					ingenie	······	
Goating Datationstion			L				
Abrasion, Cavitation, Wear	 						
Air Vaids / Bug Hales					ورميار النائل الأحدة جدت التحديل		
Efficrescence		<u> </u>	Longer R				<u>+ r </u>
Other (Explain)	Ļ	Ļ		Bugholes			and the second
				NRI - No Record			
Supplemental Information :	Yes	MNO.		Sketch Ph	ata 🗌 Video	Other (Describe	<u>k</u>
Examiner: RA	•	P.	<u>~</u>			Level:	Data: 10/3//13
Further Evaluation Required:		Yes	6	Na			
Additional Actions:			-				
(Action Request Work Order As	Ø Rear	in all lai	lipied 6	n Conscive Action) S	Suspect Areas skul)	be dispositioned by a Respon	niida Englader
Reviewer:	24		0	E Roo	BUSIRIE	ENGINEER	Date: 19 FEB 14
and the second sec	A		_# <u></u> _				- •
ANII: / Aperifation	~		<u> </u>				_ Date: <u>4/15/1</u> 4
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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

			Page 1 of			وميرودية منبور وتبيين	
Station: TML		_	nit:	Date: 11/12	13	Report No:	
System: Conjus Compone	ant:	Buttre	ess 6	louts, de	<u>}_</u>	WO No(s) .:	R2193606
Location: Building: Cont.	Elev.:	MA	Col:	VA Row	NIA	Azimuth/R	adlus: N/A
Exam Type: 🗌 Detailed Visual	Туре	Of Exam:	Direct	Mati. Type:	1	ncret	e
General Visual			Remote	wau. vype:	_ ل_ ن _	m crei	
Design Drawing(s) Trn I-	00141	1	Visual Aids:	Binoc	ulai	ns	
Surface: 🖾 OD 🔲 10			Surface / C	omponents Con	aled; [] YES	NO
Illumination Used Natu	ral	light	ing - Su	inlight	~~	· · · · · · · · · · · · · · · · · · ·	
Attributa	RI NI	31 10	7	Explanat	tion / Co	imments	
Cracks (Characterize and Size)			Hairl	ne			
Exposed Reinforcing Steal							
Exposed Metallic Items (Other)			Hbandy	ned ex,	DAVIS	ion ar	ichors
Evidence Of Grease Leekage							
Evidence Of Molature					Oblinginging		
Leaching Or Chemical Attack							
Settlements Or Deflections			-0			<u> </u>	
Degraded Patches or Repairs			revi	ovsly r oports a	rpo	ried	
Popouts , Voids, Honaycomb			Minor p	oports a	ad l	avg hole	<u> </u>
Spalls Onlid John Linco							······
Cald Joint Lines Conosian Stelning				<u>ئەرىمەرىمە ھەرە</u> ئىسمىسو ئۇرلېر سېرىمە ئە			
						استياد مناكرين	
Scaling / Dualing Coating Deterioration							میں جانب بانا <u>تیں چک</u> ۲۳۳ میں جب ب
Abrasion, Cavilation, Wear			·····				
All Voids / Bug Holes			L				
Efforescence							
Other (Explain)							****
	iable End	lication l	NRI - No Recan	dable indication	18 (Q	- Information	Only
Supplemental Information :	Yes 🕅	No 💭	Skelch P	noto []Video		ler (Describs);
Examiner: RQ		P	in		Lavel:	I	Date: 1/12
Further Evaluation Required:	U Y	es 🕅	Na		-		- T
Additional Actions:		· ·					·····
(Action Request, Work Online Tag	la Report	initialized for	or Contrativa Action)	Suspect Areae skall	be disposit	bred by a Respon	aldis Engineer
Reviswer:	<u>I</u>	ſ€.	RETPON	STALE EN	6/116	EK	Date: 12 Fee
ANIE Sperry Sta	2						Dats: 4/15/
L							

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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Anna and a second s	Page 1 of 1	
Stalion: TMI	Unit: / Date: 11/12/13 Report No:	
System: Tendons Compone	ent Containment Dome WONO(3): R21536	06
Lacation: Building: Cont.	Eter: N/A Cal.; N/A Row. N/A Azimuth/Radius; N/	4
Exam Type: Detailed Visual	Tune Of Evens: CIDirect	
Migeneral Visual	Matt. Type: Concrete	
Design Drawing(s) T/11 I -6		
Surface: 🕅 OD 🗍 ID	Surface / Components Coaled: VES NO	
Inumination Used Natu		
	RI NRI 10 Explanation / Commants	
Cracks (Characterize and Size)	MINOP CRACKING Q	
Exposed Reinforcing Steel	Water seepage on dome embeds	: 67
Exposed Metallic Items (Other)		
-Evidence Of Grease Leakage		
Evidence Of Molature		
Leaching Or Chemical Attack		
Settlements Or Deflections		
Degraded Patches or Repairs		
Popoula, Volds, Honaycomb		
Spalls	At done trench O	{
Cold Joint Lines	A literation to a first	
Consian Staining	Angle iron supports exhibit rus	
Scaling / Dusting		
Coating Deletionation Abrasion, Cavitation, Wear		——
Air Voida / Bug Hous		
Efforescence		
Other (Explain)	Rain has exposed aggregate	,
	dable Indication NRI - No Recordable Indications 10 - Information Only	
Supplemental Information :	Yes Mo Skeich Photo Video Olher (Describe):	
Examiner:R	a Pin Level: I Date: 11	12/13
Further Evaluation Required:	CI Yes XI No	
Additional Actions:	· · ·	
Action Request Work Onder, 145	and Record and initialized for Corrective Action) Suspect Areas shall be dispositioned by a Responsible Engineer	
Reviewer:	P.E., RESPONSIBLE ENGINEER Date: 191	GR 14
ANII: / sprent	Data: 4	15/14
	Page 1 of 1	<u></u>
O There is	tions were previously reported, no ch	a 19 E
U These Condit	lions were previously for real	,
V	vere noted.	•
	Topical Report 213 Attachment 2 Page 963 of 1008	

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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

	<u>161011</u>
Station: TMI Unit:	Date: 11/18/13 Report No:
System: Contradors Component: Behind miss	le shield WO No(s): R2193606
Location: Building: Cont. Else: N/A	Cal.: NA Row. NA Azimuth/Radius: NA
Exam Type: 🗍 Detailed Visual Type Of Exam: 🗐 🛛	irect Mall. Type: Concrete
General Visual	emote Mail. Type: Concrete
Design Drawing(s) TMI - 0014/1 Vis	sual Alds: binoculars/Test chart SNOC 11-026
	risce / Components Coaled: VES IN NO
Infumination Used Natural lighting -	Sunlight
Attributes RI NRI to	Explanation / Comments
	air line
Exposed Reinforcing Steel	
Exposed Metallic Items (Other)	bandoned expansion anchors
Evidence Of Grease Leekage	
Evidence Of Molsture	
	nor in several locations
Settlements Or Deflections	
Degraded Patches or Repairs	Iner
Popouts Vatas, Honeycomb	
(Spalls) AT	repair areas
Cald Joint Lines	
Concision Staining	inon @ several locations
Scaling / Dusting //	MON (B SEVERAL TOCA TONS
Abrasion. Cavitation, Wear	,
Air Voids / Bug Hales	
	nor at several locations
Other (Explain)	
Resulta Legand: RI - Recordable Indication NRI - I	to Recordable Indications IO - Information Only
Supplemental Information : Yes MNo	ch Photo Video Other (Describe):
Examiner: <u>Rapy</u>	Level: <u>II</u> Date: <u>///8//3</u>
Further Evaluation Required: 🔲 Yes 🕅 No	
Additional Actions:	
(Action Request, Work Onler, Thus Regarder, Initiated for Corre	civa Action) Suspect Areas stuli be dispositioned by a Responsible Engineer
	CESPONSIALE ENGINEER Data: 19 For A
ANII: Accurate	Data: 4/15/14
Pag	e l of l

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ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

		No. of Concession, Name	Page 1 or	1	والمراد والمراجع المتقاد		والمرد والمتافقة المتحد والمتحد والمتحد والمتحد والمتحد والمتحد والمتحد والمتحد والمتحد والمحد والمحد والمح	
Station: T.M.L		Un Un		Date: 11/15		Report No:		
System: Tendens Company	ent: FB	letwe	en But	tress 2 a	ndl	WO No(s) .:	R2193606	
Location: Building: Cont.		NA		N/14 Row		Azimuth/R	adius: N/17-	
Exam Type: Deteiled Visual		Exam:			1			
General Visual			Remote	Matl. Type:	C01	vcrete	-	
Design Drawing(s) TMI-	DOIYT	7	Visual Alds	Binocu	bre		······································	
Surface: D OD D	ži i dopo	······	Contraction of the local division of the loc	amponents Co			NO	
Attribute	RI NRI	a state of the second se		the second s		mments		
Cracks (Characterize and Size)		10Part	Hairlin					
Exposed Reinforcing Steel			Embre					
Exposed Metallic Items (Other)			Art St. C. Mailer	-101.00				
Evidance Of Grease Leakage	<u> </u>							
Evidence Of Moisture								
Leaching Or Chemical Attack			Very mi	101				
Settlements Or Deflections	l							
Degraded Patches or Repairs		前還				-		
(Papauta) Voltis, Honaycomb			And bug	holes				
Spals			At em	bed plai	tes	minor	1 1	
Cold Joint Lines								
Concision Staining							· · · · ·	
Scaling / Dusting					0		·	
Coaling Deterioration			XE	kain per-	tor m	rd ou	itside	
Abrasion, Cavitation, Wear						······································		
Air Voids / Bug Holes								
Efforescence							k.	
Other (Exclain)	<u> </u>							
Results Lagand: RI - Recom	labla indic			dable Indication		- Information		
Supplemental Information :	Yes 🕅 No		Skelch DP	holo UVldec	<u>100</u> c	ier (Describe	k	
Examiner: <u>C</u>	1	P	<u>c</u>		_ Lavel:		_ Date: 11/15/13	
Further Evaluation Required:	🗋 Yes	R	Na /				}	
Additional Actions:								
(Action Request, Work Onlar, Isa	Ropon at	Indiators for	<u> </u>				nibis Engineer	
Reviewer:		<u>re</u>	. <u>((</u> E5)	OONTIGLE E	NGIN	<u>reek</u>	Date: 12 Gas A	
ANIE: Steen 24	2						Dates 4/15/14	
						·		

Page ____ of ____

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

		Page 1 of			
Station: TMF	وبالمستقر ويستجد ويستجونني فالأمريج بالمتكرية	<u>nit: / / / / / / / / / / / / / / / / / / /</u>	Date: ////	بسياسية المتعادية ببريه ويستعد ألمو فاستنب المتراك فالتعد التهار وتبادأ وتبار	
System: Tendens Compone	ent Betwe	en Butt	ress 3 a	2nd2 WO No(s) .:	R2193606
Location: Building: Cont.	Eber .: NA	Cal: M	A Row	NIA Azimuth/F	ledius: N/A
Exam Type: Detailed Visual	Type Of Exam:	Direct	l	Concret	· · ·
General Visual		Remote	Matl. Type:	Concrel	e.
Design Drawing(s) TmI-	0014/1	Visual Aids:	Bureco	lars	[
Surface: 🔢 OD 🔲 ID	· · · ·	and the second se	imponents Co		NO
فيتراط بالمتحاظ الالالات البلاتين وإرابية والانتباط التكار التكواف المتباد المتباد المتحد الجربي ويستع كان	light - A	latural	Lighting		
Attributa	RÍ NRI IO		Explana	tion / Comments	
Cracks (Characterize and Size)		Hairlin		-	
Exposed Reinforcing Steel					
Exposed Metallic Items (Other)		Embed	nlate		
Evidence Of Grease Leakage					
Evidence Of Molsture					
Leaching Or Chemical Attack		Very Slig	ht	*	
Settlements Or Deflections					
Degraded Patches or Repairs		Grovt 1	atches_	*	
Popouts, Volds, Honeycomb					
Spalls.		al ember	plute.	1	
Cold Joint Lines	── ╎─── ┠──┨				
Concesion Steining				·	
Scaling / Dusting	╺╼╍┠╌──┠╼╼-┠			<u> </u>	
Coating Deterioration		T EXA	n per	formed or	Tside
Abrasion, Cavilation, Wear					
Air Vaids / Bug Hales	╾╌╉╼╌╌╏╴╌╴╏				
Efflorescence		Ala			
Other (Exclain) Results Legend: RI - Record	lable Indication N			an Sion Cinc	
and the second	-				
Supplemental Information :		Sterch LIPh		Other (Describe	h:
Examiner:	al	ny ny		Level: II	
Further Evaluation Required:	🖸 Yes 🗶	Na 🗡	Previous	y reported	condition
Additional Actions;	~~~~			the same	
(Action Request, Work Only, Usu	a Ropont, atc. initialed for	r Cansolive Action) &	iuspaci Arcas skall	be dispositioned by a Respon	sible Englaser
Reviewer:	P.E.	RESPONS	IRLE EN	GINEER	Date: 19 68 17
ANIE XDEMIST	~				Clate: 4/15/14
er					

Page ____ of ____

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Station: TMI Unit: / Date: 11/12/13 Report No:	
System: Fendens Component: Between Buttness 3-4-outside WO Nota: Ra193606	
Lacation: Building: Cont Else.: NA Col.: NA Row. NA Azimuth/Radius: NA	
Exam Type: Detailed Visual Type Of Exam: Direct Matt. Type: Concrete	
kal General Visual Welternole '	
Design Drawing(s) TMI-0014/1 Visual Aids: Billoculars	
Surface: 🕅 OD 🔲 ID Surface / Components Coaled: 🔲 YES 🕅 NO	
IRumination Used Natural Lighting - Sun Light	
Attribute RI NRI IO Explenation / Comments	
Cracks (Characterize and Size)	
Exposed Reinforcing Size	
Exposed Metallic liams (Other) Embed plates - A corrosion	
Evidence Of Grease Leekage	
Evidence Of Moisture	
Leaching Or Chemical Attack	
Decreted Patches or Repairs AS Dreviously Acount ted	
Papouts, Voids, Honeycomb Miner Poperts / bugholes Spalls Atring girder - minor	
Cold Joint Lines	
Concesion Staining	
Sceling / Dusting	
Coating Deterioration	
Abrasion. Cavitation, Wear	
Air Vokis / Bug Holes	
Efforescence Minor leeching / efflorescence	۲
Other (Explain) Exposed expansion unchors (abaidon	ied
Results Legend: RI - Recordable Indication NRI - No Recordable Indications IO - Information Only	1
Supplemental Information : Nes No Sketch Photo Video Other (Describe):	
Examiner: Ra Pup Level: II Date: 11/13/13	
Further Evaluation Required: 🔲 Yes 📈 No	
Additional Actions:	
(Action Request), Work Onter, Type Rogers, and Typeles for Connective Action) Suspect Access shall be dispositioned by a Responsible Engineer	
Reviewer: The Provide C.G., RESPONSIBLE ENGINEER Date: 19 FERNY	
ANII: Date: 4/15/14	
Page / of /	
U LYNUNS UDDUE FUEL FI UNDING DIAY LUNUINI	
Ocracks above Fuel Handling Bldg remains unchanged from previous report, unchanged from previous report,	
· · · · · · · · · · · · · · · · · · ·	

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

	-		Page 1 of 1			
Station: TMI		U	the second s	ate: 11/19	فبالمساف بيوب فيتستعمنها مراب كالتهايية سارد	
System: Fradad Company	ent Be	Ween	Buttress 4-	-5 (00	tside) WO No(a) .:	R2193606
Localion: Building: Co.17.	Ebav.:	MI	- Cal.: N/A	F Row:	NA Azimuth/	Radius: NA
Exam Type: Detailed Visua	Type Of	Exam:	Direct	Al MProvense	Concret	0
General Visual		-	Remote	ttl. Type:	Loncren	
Design Drawing(s) TMI	-0014/	1	Visual Aids:	Bing	cubrs	
Surface: 🕅 OD 🗌 ID.	r		Surface / Comp	onente Co	aled: 🗌 YES	NO
Illumination Used Nat	ural	light	1.79 - Su	alight	/	
Attribute	RI NRI	fo		Ekolana	tion / Comments	
Cracks (Characterize and Size)			Hairline			
Exposed Reinforcing Staal				بيسيونون شب		
Exposed Melallic Items (Other)						
Evidence Of Grease Leakage		┥──┤				
Evidence Of Molature		┦↓				and the second
Leaching Or Chemical Atlack	ļ	┿				
Settlements Or Deflections		TANKS A	- A			
Degraded Patches or Repairs	<u> </u>		Previously	rep	File	1.0
Papouts, Volds, Honaycomb	<u> </u>		Minor f	10pou	ts/ bugho	Hes
Spala	┠──┠───	╉┯╍┦				
Cold Joint Lines			<u>,</u>	موسية ومورجوا بالألاة الإغرا		
Concision Staining	<u>├</u>	┼╍┫				
Scaling / Dusting	├ ─── <i>├</i> ────	╶╁╍╍╌┨				· · · · · · · · · · · · · · · · · · ·
Gaating Deterioration	┦┙┍═ ┨╌╌╌╴				· · · · · · · · · · · · · · · · · · ·	······································
Abraston, Cavitation, Wear Air Voids / Bug Holes	┟╌╌┟╼╌╌╴					
Efforescence	<u> </u>		Slight Le	echi?	a lefflore	SCANCE
Other (Explain)	[[_	Cote on	VA		n embed plate
	dable Indica	rtion I	Ri - No Recordabl	Indicatio		
Supplemental Information :			Sketch Photo			and the second se
Examiner:	a		Di		Leval:	Date: 1/1/4/13
Further Evaluation Required:	Ves	X	Na			
Additional Actions:		ト				я. - П
Additionen Actions: (Action Request, Work Order, Is	Based at	labled f	- Comprise Antion) Com	act Ayana atal	he dimether by a Deen	onstitus Fadiscer
Action Request, Work Order, (a	14/		^		ENGIN COL	Date: 19 Ferry K
ANII: Sterus		2	- 1691 AV9			Date: 4/15/14
FUNIR _ DUMANDE P						
0			Drag i of I			

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

			Page 1 of 1
Station: TMI		and the second se	nit: / Date: , Report No:
System: Tendens Compon	ent: B.	etween	Buttness 5 + 6 (05,de) WO No(s): R2193606
Lacalion: Building: Cont	Etev.:	NA	
Exam Type: 🖉 Detailed Visual		Of Exam:	(R) inort
			Ramata Mau. Type: Concrete
Design Drawing(s) TmI-	00141	1	Visual Aids: Camera; Natural light Test chart SN OC11-026
Surface: 🔀 OD 🔲 ID	inii la		Surface / Components Coaled: M YES INC O
Inumination Used Natu	no /	119htin	
Affribute	RINE	the second s	Explanation / Comments
Cracks (Characterize and Size)			
Exposed Reinforcing Steel			<u></u>
			2 Embed plates (vertical) see altribed
-Evidence Of Grease Leakage			comments
Evidence Of Moisture			
Leaching Or Chemical Attack			
Settlements Or Deflections			
Degraded Patches or Repairs			
Popoula, Voids, Honaycomb		Saran	vernains uncharofect
Spalla			
Cold Joint Lines	<u> </u>		
Canasian Steining			
Scaling / Dualing	 		
Coating Datasiasetion			
Abrasion, Cavilation, Wear			· · · · · · · · · · · · · · · · · · ·
Air Voids / Bug Holes	<u> </u>		e manden and and and and and and and and and an
Efflorescanca	┠──┤──		Walls F. Q. Hurr Con River Dag
Other (Explain)			W side of Buttress 5 ~ Bird Poop
Supplemental Information :	Yes LI	™ <u>⊿</u> ⊔	Sketch Photo Video Other (Describe):
Examiner:	L	Pe	7 Level: Date: 11/14/13
Further Evaluation Required:	X Ye	as 🖸 /	HIG CNOTOGRAPH SPALL AREAS +
			MENT ADDITIONAL DETAIL AT ENGED 4 RETS
(Action Requised Work Onland	us Roport	ic, initialed to	or Consolive Action) Suspect Areas shall be dispositioned by a Responsible Engineer
Reviewer:	1	RE	RESPONSIBLE ENGINEER Date: 19 Feat
ANIE:			Date: 415/14
<u> </u>			Para 1 of 3

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SGR construction repair patch is coated with a shiny curing compound which is transparent and does not interfere / prohibit 100% examination. All other concrete surfaces are not coated. Condition remains unchanged.
Embed plate (vertical) that is 4"wide and 2'feet from west side of Buttress 5 has the following conditioncss:
Tendons down from top the embed plate is pulled away from the face of the containment wall approx 1/4". Concrete has spalled on the Left hand side of the embed plate.

b) 13 tendons down from top - repair patch is spalling 9"L × 5" × 1/2" D.

c) 21 tendons down from top - the embed plate has pulled away from the concrete face approx. 1/4".

3 Crack just below ring girder is 7"x 2"x 1/3".

(4) spalled area willing - noted = 1/2" in depth

B Vertical embed plate that is 4"wide and 2'feet from east side of Buttress 6, the following conditions are noted!

a) one location-embed plate concrete has degraded on Rtside. and cracks at repair area noted.

Dand location - cracking | spalling of repair area@ embed plate, c) 31d location - embed plate has pulled away from face of

concrete - concrete has separated from embed plate.

from embed plate. Topical Report 213 Attachment 2 Page 970 of 1008

d) 4th location - concrete has separated from embed plate and embed plate is not flush with face of concrete. e) 5th location - repair patch crucking and concrete separated

Page 3 of 3 f) 6th location - concrete has separated from embed plate and embed plate is not flush with concrete surface. 9) 7th location - concrete has separated from embed plate and embed plate is not flush with face of concrete. General Observations: Previously reported a) hair cracks Dabandoned expansion anchors have Category A corrosion) Embed plates that are exposed to the environment have Category A corrosion. d) Grout patches / repair areas exhibit continued degrading e) small bug holes These conditions have been previously reported, Note: Outside the scope of ASME Section X) TWE ; a meteorological / electrical boxes exhibit significant degradation (material loss due to weathering) and provide no protection.

ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

			Page 1 or	And in case of the local division of the loc	······	r r
Station: TMT		the second s	ait:	Date:	Report No:	
System: Contradions Compor		<u>etweer</u>			vtsde) WO No(a).:	Construction of the local division of the lo
Location: Building: Cort.	Ebev.:	NA	Cal.:	1/17 Row.	NIA Azimuth/R	solus: NIA
Exam Type: Detailed Visual	Type	Of Exam:	Direct	Real Trees	Concret	0
General Visual			Remote	Mail. Type:	Coperat	
Design Drawing(s) TmI-	0014	17	Visual Aids:	binocu	lars	
Surface: 🕅 OD 🗍 ID			Surface / Co] NO
Mumination Used Sun ig	ht:	Test	card s	NOCII-	- 026	
Attribute	RIN	31 10		Explana	fion / Comments	
Gracks (Characterize and Size)			Hairlie	<u>re</u>	×	
Exposed Reinforcing Steel						
Exposed Metallic Items (Other)	<u> </u>					
Evidence Of Grease Leekage						
Evidence Of Moisture	 					
Leaching Or Chemical Attack					and the second	
Settlements Or Deflections						
Degraded Patches or Repairs			······		- X.	
Papaula Valds, Honaycomb	┞───┠──		bugholes	*		
Spala						
Cold Joint Lines	├ ── │ ──					
Concision Steining						
Scaling / Dusting						
Casting Deterlaretion	┝──┝─			<u></u>		
Abreston, Cavitation, Wear	┝┈┼╟┈╸					
Air Voids / Bug Hales						
Efforescence				·		<u> </u>
Other (Explain)				red expe	ansion anch	
Results Legend: Ri-Recor	dable ind		IRI - No Record		والمتكار المرقع بوارية ويداكم والزار المتكار المتكار المتكار	
Supplemental Information :	Yes 🔲	vo 🗆	Sketch Ph	oto 🗍 Video	Other (Describe)r
Examiner: R	a	P.	ly -		Level: TE	
Further Evaluation Required:		35 X	Na →	+ Previou	sly reporta	1
Additional Actions:					- 	
(Action Request Work Order 14	Rosen	tc_initiated for	Controlive Adian) {	Suspect Acces shall	be dispositioned by a Respon	sible Engineer
Reviewer:	E	<u>(?E.</u>	(ESRON	SIBLE E	NGINGER	Date: 19_668/4
ANIA: Steery		\leq	£. —			Date: 4/15/14
K J						

Page ____ of ____

ATTACHMENT 4

· · · · · · · · ·		NDE Report Page 1 of X	2 Ral II	15/13
Station: TMI	L u	ut: /	Date: 11/5/	3 Report No:
System: Tendens Compone	ent Tendon (ballery Base	e Mat	WO NO(9) .: R2193606
Location: Building: Cont.	Elev.: 2 253			In Azimuth/Radius: NA
Exam Type: 🔯 Detailed Visual	Type Of Exam:	Direct		
General Visual		Remote	Aatil. Type: 🛛 🤇	concrete
	1-0016/1		flashlight	Tape measure
Surface: Di OD [] ID			ponents Coale	
Mumination Used Flashligh	ht and light			hat.
	RI NRI DO			/ Comments
Cracks (Characterize and Size)				
Exposed Reinforcing Steel		Advacenti	5 V-143	and V-149 (V-150)
Exposed Metallic Items (Other)				
Evidence Of Grease Leakega				
Evidence Of Molature				on floor in two locations
Leaching Or Chemical Atlack		¥ See C	omment or	rattached page
Settlements Or Deflections		<i>ka</i>		
Degraded Patches or Repairs		See Com		
Popouls, Vaids, Honeycomb		Minus popu		
Spalls		AT CONSTRU	LT.O.A JOIN	t 6' above top basemat
Cold Joint Lines	┝───┨╌╍┥	<u></u>		
Concision Staining				
Scaling / Dusting				
Coating Deterioration	┝─╼╉───┤			
Abrasion, Cavitation, Wear Air Voida / Bug Holes			<u></u>	an an a at statements of a second
Efforescence		K 500 00	mmant a	rattached Page
Other (Explain)		JEE UD		rante paye
Results Legend: RI-Record	dable Indication	RI - No Recorda	ble Indications	IO - Information Only
Supplemental Information :] Other (Describe):
Examiner: R Q	ιρ	is	L	evel: II Date: 11/5/13
Further Evaluation Required:	Yes 🕅	Na		
Additional Actions:		110		
	us Rocat, etc. wildend A	r Conceptive Action) Su	anect Areas shall be d	lapositioned by a Responsible Engineer
Reviewer 2/10	PE.	1	CALE EN	
	, 1. 5.	t Ser Kan		
ANII: Keen A	y			Date: <u></u>
		Page of	-	

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- D Leeching / efflorescence heavy accumulation noted@ 2 locations. Accumulation buildup approx. 14 From face of concrete. Stalactites noted@ interface between ceiling and wall. Previously noted.
- (2) Leeching/efflorescence noted randomly 360° around tendongallery. This condition was previously noted. Located inver/outer walls.
- 3 Two cavity repairs using epoxy was noted at location V-149 and V-150. The epoxy is not flush with the surface of the concrete. One repair 7% Lx 1/2"w. The other repair is 21/2" × 21/2".
- (D) Other conditions noted, i.e. popouts, hairline cracks and buy holes were previously reported.
- (5) stress cracks previously reported remain @ \$ 0.015"
- 6 Exposed metal lembed plates have pitting 2 0,010". This was previously reported.
- @ bround water noted in two locations on floor.

ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination

		n F	ide Repoi	re Ra $re Ra $	5/13		
Station: TMI		Uni		Date: 11/5		port No:	
System: Contants Compone	nt Cont.	Bld	g Alligat) No(9).:	R2193606
Location: Building: Co.1+	and the second se	273	-ferran and the second s	VIA ROW.	and the second	zimuth/Re	
Exam Type: 🕅 Detailed Visual	Type Of E	xam: 🛛	Direct		dad	crete	
General Visual			Remote	Mail. Type:	Con	6/2/~	-
Design Drawing(s) TMI-0	014/1		Visual Aids:	Flashligh	t / hand	dhat 1	ight
Surfaca: 🌆 OD 🔲 ID			Surface / Co	amponents Co	aled: 🛛 Y	ES 🖉	NO
Wumination Used						·	
Attribute	7 4 <u>7 7 7 7 7</u>	10		Explana	lition / Comm	nente	
Gracks (Characterize and Size)			Hair lin-	e – <u>See a</u>	Hached	page	
Exposed Reinforcing Steel							
Exposed Metalific Items (Other)							
Evidence Of Grease Leakaga			<u>see_atta</u>	iched pag	res for	deta	15
Evidence Of Moisture		-	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~				
Leaching Or Chemical Attack	P		<u>see atta</u>	ched pag	es for	detai	15
Settlements Or Deflections	╼┥──┼						
Degraded Patches or Repairs			7.11	Teles - C	<u> </u>		A
Popouta, Volds, Honaycomb		- 後期		holes - s	ee ett	ached	pages
Spalla			Miner	<u></u>		· · · · · · · · · · · · · · · · · · ·	
Cald Joint Lines	╾┼╾╾╀						
Consion Staining			·····				
Scaling / Dusting	╌╋╍╌╆		الأأن واسترجعت ويتعاد والمتناكر والمراجع				
Coating Delegioration	╺╼╅───┼			,			
Abresion, Cavitation, Wear Air Voids / Bug Holes							
Efflorescence			See att	ached pa	ges to	r det	a. Is
Other (Exclain)						or de	tails
	able indicatio	on NF		dable inclication		formation	
Supplemental Information :							
Examinar: R	a	P.	n		Level:	IL	Data: 1/5/1
Further Evaluation Required:	I Yes	R N	ia			بي المراجع ا	
Additional Actions:				~ <u>~</u>			
(Action Request, Work Onlern stru	a Roport, etc. initi	laleri Sor (Connective Action)	Suspect Areas shall	be dispositioned	by a Respons	ibin Engineer
Reviewer: Man 24	Pe	E	Respond	SIBLE EN	GINEER	,	Date: 19 For
ANII: Seeur It		5				·	Data: 4/15/1
			Page 1 of	Ц			

Page 2 of 4 REP-1098-510 Appendix J, Page 58 of 70 ER- AA - 335-019 () wall is painted approx. 11" from floor. 3 At Buttress 1 - bugholes, an Il" grout patch, and grease was noted on the wall adjacent to the tendons. 3) The following conditions were noted between Buttness 1 and 6: a) hair line cracks approx 5ft past of Azimuth O" Dhairline cracks 2ft east Azimuth 0" a) A cavity 3"L x 1/2" w x 1/8" d @ Azimuth 350" d) hair line cracks between Azimuth 350° and 340° were leeching oil e) hairline cracks close to Azimuth 340° was noted as leeching / efflorescence, f) hairline cracks 5ft east of Azimuth 340° leeching oil. g) Approx 1 cup of oil noted on floor. h) hair line cracks leeching oil 1 ft west of Azimuth 330°. (4) The following conditions were noted @ Buttress 6: a) hairline cracks, bug holes and popouts b) Twenty-one (21) abandoned expansion anchors were abandoned, one has boltin the hole. These are aligned 8, 6 and 7, progressing west to east, One cavity, 31/2" × 31/2" × 2"d appears to be an abandoned expansion anchor. (5) The following conditions were noted between Buttress 6 and 5. a) leeching / efflorescence 7' west of Azimuth 310° above Rop 4/4/13 electrical conduit mounted on well. b) hair line cracks located @ Azimuth 300° and east there of have 4 rows of leeching oil, Three are dry and one is wet Topical Report 213 Attachment 2 Page 976 of 1008

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(5) Continued C) Hairline cracks noted @ Azimuth 290°- two have oil (wet) leeching thru the wall. The other hair line crack the oil is dry. (Buttress 5 had the following conditions ! a) Minor hairline cracks < 0,010 and very minor leeching / efflorescence noted. b) Oil/grease noted on wall and grease cap. D Between Bottress 5 and 4 the following conditions were noted! à) Hairline cracks < 0,010 and very minor feeching/ efflorescence. 8) Bottress 1 - the following conditions were noted: a) minor bug holes b) At Azimuth 40° white stains were observed emanating from a galvanized angle iron support. (Info only) c) very minor leeching/efflorescence noted approx 20" west side of tendons (between Buttress I and 2) d) Hairlive cracks leeching oil thru concrete noted 5' east of Azimuth 400 e) Approx. 15 expansion anchors abandoned @ Azimuth 600 f) Dry and wet oil leeching thru concrete was noted (a) Azimuth 600 9) Six (6) a bendoned expension anchor holes have been grouted.

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(g) conditions noted @ Buttress 2 a) very minor bugholes b) wet oil noted on grease caps and well 1 Conditions noted @ between Buttress 2 and 3: a) minor popouts and bug holes b) hair line cracks & 0.010 noted @ Azimuths 90°; 100°; and 110°. Three were noted as having wet oil leeching thru concrete; the other has dry oil. (10) Conditions noted @ Buttress 3: a) bugholes b) one grout patch c) two cavities (just west of Buttress 3); one cavity 3x 3/8" × 1/4"; the other 3" × 1" × 1/3".

Note: All the conditions noted above were previously reported and no apparent changes have occurred,

ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination

		NDE Report Raf Page 1 of x 6 1/1/13
Station: TMI	ហ	
in the second	: Containm	
	Eberv.: A//	Cal.: N/A Row. N/A Azimuth/Radius: N/A
	Type Of Exam:	
Migeneral Visual	•	Mau. Type: Concrete
	0015/1	Visual Aids: See below (2)
Surface: 🕅 OD 🔲 ID		Surface / Components Coaled: 19 YES 19 NO as noted
Illumination Used (2)		
Attribute RI	NRI IO	Explanation / Comments
Cracks (Characlerize and Size)		
Exposed Reinforcing Steel		See attached pages for
Exposed Metallic Itams (Other)		specific comments
Evidence Of Grease Leakage		
Evidence Of Moisture	- 	
Leaching Or Chemical Atlack		
Settlements Or Deflections	-┣	
Degraded Patches or Repairs	╺┼╍╍╌╟╶╍╊	
Popouts Volds, Honaycomb	╺┼╍╍┟╍╍┟	
Spalls	╶╂───╊─╾╴╄	
Cold Joint Lines		
Conceion Steining		
Scaling / Dusting	╺╉───╁──┼	
Coating Deterioration	╺╋╌╌┦╼╌┦	
Abrasion, Cavitation, Wear	<u>_╊</u> ┨ ₁ ╊	
Air Voids / Bug Halas	╺-╉╼╍╍╌┠╸╼╫┠	
Efforescence	-{1}	
Other (Exclain) Results Legend: RI - Recordeb	In function Al	Ri - No Recordable Indications IQ - Information Only
	in the second	
Supplemental Information : WYes		Sketch Photo Video Other (Describe):
Examiner: <u>Ka</u>	Py	Level: Date: 11/12/13
Further Evaluation Required:] Yes 🖬 I	No
Additional Actions:		
(Action Request, Work Onlar Jesus R	openi, etc. Initialed for	Conscient Action) Suspect Asses shall be dispositioned by a Responsible Engineer
Reviewer: 2000-27	<u></u>	. RESPONSIBLE ENGINEER Date: 19 For 14
ANIE: Maryot		Cats: 4/15/14
h		Dave 1 as h
(5) Elast Lat Lat 1	+:	Page _ of b
and Test Chan	t snow	rted on hard hat, beacon light, binocular. 511-026
		213 Attachment 2 Page 979 of 1008

Report 213 Attachment 2 Page 979 of 10

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Page 2 OF 6

() This examination was performed from floors, roots, platforms, walkways, ladders and other permanent vantage points. This examination was performed on 11/4/13 through 11/8/13, specific examination results are provided where rooms are identified on the doorway, otherwise general area comments are provided.

Note: In all instances the conditions noted / observed are reported as "Information Only." No "Reportable Indications" (RI) were noted.

→ 281 Elevation - Door I - 10\$7 "Histis
A Walls are painted - minor Chipping
b) abandoned expansion anchors
b) abandoned expansion anchors
b) grout repairs

= 281' Elevation - Door I-108 a) walls are painted b) Popouts/bugholes (minor) c) 6 abandoned concrete expansion anchors

Topical Report 213 Attachment 2 Page 980 of 1008

Page 3 of 6 098-510 Appendix J, Page 63 of 70 ~281' Elevation - Door I-104 a) walls painted c) minor bugboks ~ 281' Elevation @ ladder beside Buttress #1 a) epoxy repair patch behind ladder 9"x9" b) popouts and bugholes (minor) = 322' Elevation - Room I-204 a) hair line cracks, minor bugholes and popouts b) very minor leeching / efflorescence c) exposed embed plates - minor corrosion/p.tting d) 3 abandoned expansion anchors holes = 322' Elevation - Room I-203 a) minor popouts and buyholes b) 3 abandoned expansion anchors c) grout patch repairs d) pipe = 3/4" diameter protruding from wall adjacent to junction box

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Page 4 oF 6

= 322 Elevation - room east of Buttress #1 a) minor popouts and bugholes b) = 3/4" pipe protruding from concrete a hairline cracks adjacent to Butness #1 d) oil/grease on Buttness@tendons-not on containment wall. = 322' Elevation - Buttness#1 a) minor popouts and bugholes b) construction seams = 322' Elevation west side of Buttress #1 (Room I-202) a) minor bug holes b) hair line cracks c) construction seams 2 322' Elevation - Room I - 202 between Buttress land 2 a) oil/grease on Buttress | west side and not on containment wall b) minor hairline cracks c) leeching / efflorescence I foot from Buttress #1 wall d) grout repair patches e) 2 abandoned expansion anchors f) 3/4" pipe protruding = 4" out from wall face 9) minor bugholes and popouts Report 213 Attachment 2 Page 982

P-1098-510 Appendix J, Page 65 of 70

Page 5 oF 6 = 322' Elevation - Room east of I-202 a minor popouts and bugholes a) minor bugholes b) bottom portion of wall painted = 13" = 357' Elevation a) grout patches b) Popouts and bugholes 2357' Elevation - 2nd room west of I-202 a) hairline cracks b) bugholes gvery minor leeching/ efflorescence = 357' Elevation - West side of Buttress #6 a) minor popults and bugholes

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Page 6 OF 6

General observations of areas that are not clearly | specifically defined - all elevations - Turbine Bldg.

a) hair line cracks b) abandoned expansion anchors c) minor leeching / efflorescence d) minor popouts and bugholes b) grout and epoxy patches

Note! All conditions noted are acceptable. These are being reported as "Information Only"

ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report Page 1 of 1

	F8961011
Station: TMI	Unit: / Date: 11/12/13 Report No:
System: Fenders Component: Bu	ettress 6 (outside) WO NO(9): 12193606
Location: Building: Cont. Elev.: M	A Cal.: NA Row. NA Azimuth/Radius: NA
Exam Type: Detailed Visual Type Of Exa	am: Direct
Migeneral Visual	man: Lillinger Mail. Type: Concrete
Design Drawing(s) TMI-0014/1	Visual Aida: Binoculars
Surface: BOD D ID	Surface / Components Coaled: YES INO
المراجعة ويستحد المنتي التشارية التلابي ويتشرون وتتشائلة تشتهم بتبات ومحابا التسريك الأعممه بمباد بشكالا ومعابها فاستنب	hting
Attributes RI NRI K	
	Hairline cracks
Exposed Reinforcing Steel	7441 - F 174 5 - 177 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 - 5 -
Exposed Metallic Items (Other)	Abandoned expansion anchors
Evidence Of Grease Leakage	
Evidence Of Motsture	
Leaching Or Chemical Attack	
Settlements Or Deflections	
Degraded Patches or Repairs	Heviously reported
Papouts, Volds, Honeycomb	Minor bugholes and popouts
Spalls	
Cold Jaint Lines	
Conasian Staining	
Scaling / Dusting	
Goating Deterioration	
Abrasion, Cavitation, Wear	
Air Volds / Bug Holes	
Efforescance	
Other (Explain)	Category A corrosion of embed plates
and the second	n NRI-No/Recordable Indications 10 - Information Only
Supplemental Information: Types Witho	Sketch, Photo Video Other (Describe):
Examiner: RA	Level: Date: //////
Further Evaluation Required: 🔲 Yes 🖉	2 No /
Additional Actions:	
(Action Request, Work Onlac Asus Roport to Initial	ed for Conscilve Action) Suspect Areas shall be dispositioned by a Responsible Engineer
	E. RESPONSIBLE ENCLOSER Date: 19 FORM
ANIE: Accent the	Cata: 4/15/19
L	Page of

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Topical Report 213 Attachment 2 Page 985 of 1008

Revision 0 Page 17 of 17

			NDE Repor Page 1 of 1					
Station: TMI	· <u>بر معالی میں میں معا</u> قط م		Init: /	Date: 12/4	11.3	Report No:	1	ï
the second s		and the second se	and the second design of the s	والمرابع والمتحد والمحافظ والمحا	112	and successful the plant states of the last state of the last stat	100,000	
	int Wes		سليتي يبتك محمد فيواديهم	ress 3	l	WO No(s) .:	the second s	Commences of the local division of the local
Location: Building: Avk	Ellev.:	305	ويستعديني والمتبعين ويرتعي المشكر البالان والمتك	1/14 Row.	NA	Azimuth/R	adius: 1	IR
Exam Type: Detailed Visual Bigeneral Visual	Type Of	Exam	I: Direct	Mall. Type:	Con	crete		
Design Drawing(s) TMI-	0014/1		Visual Aids:	Flashfigh	+ 7	est chart	0011-0	126
Surface: DO D D D			والمراجع والمقوط فستشتر والمتشق والمحاط	mponents Co	The second s	YES [1 NO	
Inumination Used Flash	light	7.	est Chart	- OC11-	the second s			{
Attribute	RI NRI	10	Station of the state			mments		
Cracios (Characientze and Size)			۲۵٬۵۰۵ ال اوري <u>من ا</u> لغا <u>مي من المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة المراجعة ا</u>				للقديب بتكري أستعد الأشرابان	
Exposed Reinforcing Steel	1					······································		
Exposed Metallic Items (Other)						وي السور من من الألوك المكان المريد	::-::::::::::::::::::::::::::::::::::	
Evidence Of Grease Leakaga			Minor					
Evidence Of Molatura								
Leaching Or Chemical Attack								
Settlements Or Deflections								
Degraded Patches or Repairs								
Popoula, Volds, Honaycomb			Minor bi	igholes_				
Spalls				/				
Cold Joint Lines					بدعة المباركة			
Concision Steining						,		
Scaling / Dusting								
Gaating Delevioration	·							
Abrasion, Cavitation, Wear							المالي مراجع والمتعامل	
Air Voids / Bug Holes	<u> </u>		ļ					
Efforescence		TRI STA						
Other (Explain)		NO.	Brown 5	tain on	wall	- Origin		wn
and the second statement of the second s	والمتعادية بريك أوريك البربيك		NRI - No Record	ومحربه ويعارض ومقدوسا الرجمي ومقاطي		- Information		
Supplemental Information :	es Ma		Sketch []Pho	osbiVII oli		er (Describe)		
Examiner: <u>E</u> <u>U</u>	£	1	7		Level:		Date: 12	4/13
Further Evaluation Required:	🗌 Yes	X	Na .					
Additional Actions:	•							
Action Regenter Work Onton Linua	Report, etc. In	iliakad fo	or Corrective Action) S	uspact Areas abult	be disposib	ance by a Reapon	ible Englaser	-
Reviewer:	<u>e</u>	?€.	RESPON	RIE ENG	IN COL	د ا	Date: /91	See 14
ANIE: ADREEN M		\leq	<u>, </u>				Data: 1	* * * *
				*				

ATTACHMENT 4 ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Page ___ of ___

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ATTACHMENT 4

ASME IWL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Page 1 of 1						
	Init: / Date: 12/4/13 Report No:					
System: Tendons Component Butters	54 281 Chu Aux B/dg WO No(s): R2193606					
Location: Building: Avx Elev.: 26/	Col.: N/A Row. N/A Azimuth/Radius: N/A					
Exam Type: 🗌 Detailed Visual Type Of Exam	Matt. Type: Concrete					
General Visual	Remote					
Design Drawing(s) TINI-0014/1	Visual Aida: Flashlight Test Charloc 11-026					
Surface: B OD D ID	Surface / Components Coaled: MYES INO X					
Humination Used Flashlight and	Test chart OC-11-026					
Attribute RI NRI IQ	Explanation / Comments					
Cracks (Characterize and Size)						
Exposed Reinforcing Steel						
Exposed Metallig Items (Other)						
Evidence Of Grease Leakage						
Evidence Of Maisture	Note: Examination limited due to					
Leaching Or Chemical Atlack	piping, conduit, junction boxes					
Settlemente Or Deflections	etc. which obscured vision					
Degraded Patches or Repairs	A The buttress is not painted and					
Papouts , Volds, Honeycomb	containment walls are painted					
Spalls						
Cald Jaint Lines						
and a second						
Scaling / Dusting						
Coating Daterlargian						
Abrasion, Cavitation, Wear Air Valda / Bug Holes						
Efforescence	Almor leeching leftlarescence					
Other (Explain)	Abandoned expansion anchors and holes					
	NRI - No Recordable Indications IO - Information Only					
Supplemental Information : TYes Witto] Skelch Photo Video Ofher (Describe):					
Examiner: RaPi	2 Level: Date: 4/4/13					
Further Evaluation Required: 🔲 Yes 💐	Nα					
Additional Actions:						
(Action Request Work Opter, Issue Report, etc. Joliejos	for Cornective Action) Suspect Arese shall be dispositioned by a Responsible Engineer					
Reviewer: Vara Peter						
ANIE / Leeup to	Data: <u>41511</u> 4					
	Page / of /					

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C.J.

Rap 12/4/13

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ATTACHMENT 4 ASME IVIL (Class CC) Containment Concrete Detailed or General Visual Examination NDE Report

Station: TMT_ Unit: / Date: 1/2////3 Report No: System: Marcons Component: Building: Mux West side WO No(a): R2/93606 Location: Building: Mux Elsev: 305 Col: N/A Azimuth/Radius: M/A Exam Type: Detailed Visual Type Of Exam: Direct Matt. Type: Concrete Besign Drawing(s) TMI - 0014 // Visual Aids: Flash/joht Test chart 0C//-026 Surface: OD ID Surface: Concrete INO INO Iffundation Used Flash/ight - Test Chart Ocll-026 INO INO Altributes RI NRI IO Explanation / Comments Cracks (Characterize and Size) I Explanation / Comments Explanation / Comments Exposed Metaillo Itams (Other) I I Inor Explanation / Comments Explanation of Characterize and Size) III III IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
Location: Building: Avx Etev:: 305 Col:: N/A Row: M/A Azimuth/Rediue: M/A Exam Type: Detailed Visual Type Of Exam: Direct Matt. Type: Concrete Besign Drawing(s) TMI - 0014 /1 Visual Aids: Flash1.pht Test charf 0C11-024 Surface: OD ID Surface / Components Coaled: YES NO Mun(nation Used Flash1ight - Test charf 0C11-024 Aitribute RI NRI IO Explanation / Comments Cracks (Characterize and Size) II Explanation / Comments INO Exposed Metallicitizes Minor Explanation / Comments Eaching: Evidence Of Greese-Lesiage Minor Explanation Seams Exitements Or Deflections Inor Explanation Seams Degraded Patches or Repairs Inor Explanation Seams Degraded Patches or Repairs Inor Explanation Seams Evidences Inor Explanation Seams Inor Explanatin therein Inor
Exam Type: Detailed Visual Type Of Exam: Direct Mail. Type: Concrete Besign Drawing(s) TMI - 0014/1 Visual Aids: Flashlight Test chart 0c11-026 Surface: OD ID Surface / Components Coaled: YES NO Illumination Used Flashlight - Test Chart OCII-026 NO NO Attributes Rt NRt IO Explanation / Comments Cracks (Characterize and Size) II Explanation / Comments Exposed Metallicitams (Other) III IIII Exposed Metallicitams (Other) IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
Image: Second State Image: Second State Design Drawing(s) Tml - 0014 / 1 Visual Aids: Flash 1.9h T Test charf OC 11-026 Surface: Image: OD 1 Image: Second State Image: Second State Image: Second State Image: Second State Surface: Image: OD 1 Image: Second State Image:
Billioneral Visual Image: Second
Surface: OD ID Surface / Components Coaled: YES NO INUmination Used Flash light - Test Chart Ocli-o26 NO NO NO NO Attributes RI NRI IO Explanation / Comments NO Attributes RI NRI IO Explanation / Comments Cracks (Characterize and Size) IO Explanation / Comments Exposed Reinforcing Steal IO Exposed Metallic Items (Other) Exposed Metallic Items (Other) IN IN Evidence Of Grosse Leskage IN Minor brown Staining Evidence Of Grosse Leskage IN Construction Staining Evidence Of Hotstme IN Construction Staining Evidence Of Charical Attack IN IN Degraded Patches or Repairs IN IN Degraded Patches or Repairs IN IN Spairs IN IN Cold Joint Lings IN IN
Illumination Used Flashlight - Test chart Ocli-oab Altribule Ri NRi IO Explanation / Comments Cracks (Characterize and Size) IO Explanation / Comments Exposed Reinforcing Steel III IO Explanation / Comments Exposed Metallic Items (Other) IIII IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
Attribute RI NRI IO Explanation / Comments Cracks (Characterize and Size) Exposed Reinforcing Sizei Exposed Reinforcing Sizei Exposed Reinforcing Sizei
Cracks (Characterize and Size) Exposed Reinforcing Steel Exposed Reinforcing Steel
Exposed Reinforcing Steel
Exposed Metallia Itams (Other) Minor brown Staining Evidence Of Grosse-Leskage Minor brown Staining Evidence Of Motature Construction Staining Leaching Or Chemical Atlack Degraded Patches or Repairs Degraded Patches or Repairs Spairs Cold Joint Lines Degrade
Evidence Of Gresse-Leakage IIII Minor b Yown Staining Evidence Of Molature Construction Seams Construction Seams Leaching Or Chamical Atlack Construction Seams Construction Seams Settlements Or Deflections Construction Seams Construction Construction Descraded Patches or Repairs Seams Construction Construction Construction Spairs Construction Construction Construction Construction Construction
Evidence Of Motature Construction Seams 1 Leaching Or Chemical Atlack
Leaching Or Chamical Atlack
Settlements Or Deflections i Degraded Patches or Repairs i Ponouta , Voids, Honeycomb i Spails i Cold Joint Lines i
Degraded Paiches or Repairs Popouls , Voids, Honeycomb Spalls Cold Joint Lines
Papaula , Valds, Hanaycamia Spalla Cald Jaint Lines
Spalls Cald Joint Lines
Cald Joint Lines
Scaling / Dusting
Coating Datestoration
Abrasion, Cavitation, Wear
Air Voide / Bug Holes
Efforespence
Other (Explain)
Results Legend: RI - Recordable Indication NRI - No Recordable Indications IO - Information Only
Supplemental Information : Tyes (1940] Sketch Photo Video Other (Describe):
Examiner: <u>Raph</u> Level: <u>II</u> Data: 12/4/1
Further Evaluation Required: 📋 Yes 🔯 No
Additional Actions:
(Action Request, Work Creater, Landa Agaon, eta initialasi (ar Corrective Autor) Suspect Areas shall be dispositioned by a Responsible Engineer
Reviewer: The Att, P.E., RESPONSIBLE ENGINEER Date: 19 For
ANIE: Deter 4/5/10
Page / of /

Topical Report 213 Attachment 2 Page 988 of 1008



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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 16 of 20 Revision 0

	TMI UNIT 1 TENDON ANCHORAGE GREASE CAP INSPECTION							
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE		
		YES/NO	LEAKAGE *	YES/NO	↔ YES/NO			
V-1	Top & Bottom		N	N	N	WER 12-4-13		
V-2	TeB	N	N	N	N	WRR 12-4-13		
V-3	TEB	N	N	N	N	WRR 12-4-13		
V-4	TEB	N	N	N	W	WER 12-4-13		
V-5	TEB	N	N	N	N	WRK 12-4-13		
V-6	TEB	N	N	N	N	WRR 12-4-13		
V-7	TEB	N	N	N	N	WRR 12-4-13		
V-8	TEB	N	N	N	N	WRR 12.4.13		
V-9	TEB	N	N	N	N	WRR 12.4.13		
V-10	Tib	м	N	N	N	WRR 12-4-13		
V-11	TB	N	N	N	N	WRR 12-4-13		
V-12	TIB	N	N	N	N	HRR 12-4-13		
V-13	TEB	N	N	N	N	WRR 12-4-13		
V-14	TIB	N	N	N	N	WRR 12.4.13		
V-15	Tib	N	N	N	N	WRR 12.4-13		
V-16	TEB	N	N	N	N	WRR 12-4-13		
V-17	TYB	N	N	N	N	WAR 12-4-13		
V-18	TEB	- M	N	N	N	WRR 12-4-13		
V-19	TEB	N	N	N	N	WER 12.4.13		
V-20	TEO	N	N	N	N	WRR 12.4.13		
V-21	Tib	N	M	N	N	NRR 12-4-13		
V-22	TAB	N	N	N	N	WRR 174-13		
V-23	TEB	N	N	N	N	URR 12-4-13		
V-24	TIG	N	N	N	N	WRR 12-4-13		
V-25	TOB	N	Ň	N	N	WRR 12.4-13		
V-26	TEB	N	N	N	N	WRC 12-4-13		
V-27	TEB	N	N	N	N	HRR 12-4-13		
V-28	TIB	N	N	N	N	NRR 12-4-13		
V-29	TAB	N	N	N	N	URR 12.4.13		
V-30	TEB	N	N	<u>N</u>	N	WRR 12-4-13		
V-31	TEB	N	N	N	N	WRP 12-4-13		
V-32	TER	N	N	N	N.	WRR 12-4-13		
V-33	TEB	N.	N	N	A	well 12.4-15		
V-34	TEB	N	N	N	N	WRR 12.4.13		
V-35	TEB	N	N	N	N	WRR 12.4.13		
V-36	TEB	N	N	N	N	WPR 12.4-13		

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.

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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 17 of 20 Revision 0



	TMI UNIT 1	TENDON A	NCHORAG	E GREASE CAP	INSPECTIO	N
TENDON	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF	INSPECTOR'S
	BUTRESS	YES/NO	LEAKAGE *	YES/NO	CORROSION	DATE
V-37	TEB		YES/NO	<u>-</u>		WER 12-9-13
V-38	TEB	<u>N</u>	<u>N</u>	N N	N	
V-39	TEB	<u>N</u>	N	I	N	WRR 12-4-13
V-40	TEB	N	N		N	WRR 12-4-13
V-41	TEB	N	Ň	N	N	WER 12-4-1
V-42	TLA	N	Ň	N	N	LIPE 12-4-13
V-43	TAB	N	N	 	Ň	WRE 12.4-1
V-44	TEB	~~~~~	N	Ň	1	WER 12-4-13
V-45	TEB	N	N	N	N N	WP2 12-4-1
V-46	TEB		N	- N	N	JEE 12-9-19
V-47	TEB		N	N		WRR 12-4-1
V-48	TEB	N	- 	N		WRR 12-4-1
V-49			N	N	· · · · · · · · · · · · · · · · · · ·	NPR 12-4-1
V-49 V-50	TEB	<u>N</u>	N		<u>N</u>	WRR 12-4-1
V-50 V-51	TEB	<u>N</u>	· · · · · · · · · · · · · · · · · · ·	<u>N</u>	N	WRP 12-4-1
V-51 V-52	TEB	<u>N</u>	N	N	N	
V-53	TEB	N	N	<u>N</u>	<u>N</u>	WRR 12-4-1.
V-53 V-54	TEB	<u> </u>		<u> </u>	N	WRR 12-4-1
V-54 V-55	TeB	<u> </u>	<u>N</u>		N	138 12-4-1
V-55 V-56	TEB	N	N	<u> </u>	<u> </u>	MRR 12-4-13
	TEB	N	N	N	<u>N</u>	WRP 12-4-13
V-57 V-58	TAB	N	<u> </u>	N	<u>N</u>	WRR 12-4-1
	TEB	N	N	<u>N</u>	N	WRR 12-4-1
<u>V-59</u>	TAB	<u>N</u>	N	N		NRR 12-4-1
V-60	Teb	N	N.	N	N	WRR 12-4-12
V-61	TEB	<u>N</u>	N	N		URR 12-4-12
V-62	TEB	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	WRR 12-4-1
<u>V-63</u>	TEB		<u> </u>		N	WRK 12-4-1
V-64	TiB	N	N	<u>N</u>		NPR 12-4-1
V-65	TB	N	<u> </u>	<u> </u>	<u>N</u>	WR 12-4-1
V-68	TB	<u>N</u>	<u> </u>	<u> </u>		WRR 12-4-1
V-67	TES	N	N	<u>N</u>	N	WRR 12-4-1
V-68	TEB	N	N	<u> </u>	N	URR 12.4.1
V-69	TIB	N	N	<u>N</u>	N	WRR 12.4-1
V-70	TEB	~~	N	<u> </u>	N	MRR 12.4-1
V-71	TEB	N	N	N	N	KRR 12-40
V-72	TIB	N	N	N	N_	NRR 12.4-1

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.6 09/03/13 Page 18 of 20 Revision 0

TMI UNIT 1 TENDON ANCHORAGE GREASE CAP INSPECTION							
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE	
		YES/NO	YES/NO	YES/NO.	YES/NO		
V-73	TEB	N	N	N	N	HRR 12-4-13	
V-74	TEB	N	N	N	N	WRR 12-4-13	
V-75	TEB	N	N	N	N	WER 12-4-13	
V-76	TEB	N	N	N	N	WRR 12-4-13	
V-77	TB	N	Ń	N	N	WRR 12-4-13	
V-78	TAB	_N	N	N	Ň	HRR 12-4-13	
V-79	TEB	N	N	N	N	WRR 12-9-13	
V-80	TIB	N	N	N	N	NRR 12-4-13	
V-81	TEB	N	N	N	N	WRR 12-4-13	
V-82	TiB	N	N	<u>N</u>	N	URR 12-4-13	
V-83	TAB	<u>N</u>	N	N	N	WER 12-4-13	
V-84	TEB_	<u>N</u>	N	<u>N</u>	<u>N</u>	NRL 18.9-13	
V-85	TAB	N	N	N	<u>`N</u>	Well 12-9-13	
V-86	TEB	N	N	N	<u>N</u>	WER 12.4-13	
V-87	TEB	N	N	N	N	NER 12413	
V-88	TAB	N	N	N	N	WRK 12.9-13	
V-89	TEB	N	N	N	<u>N</u>	WRR 12-4-13	
V-90	TEB	<u>N</u>	<u> </u>	<u>N</u>	<u>N</u>	WRR 12-9-13	
V-91	TAB	N	<u>N</u>	<u>N</u>	<u>N</u>	NRC 12-4-13	
V-92	TiB_	N	N	N	N	NRR 12-4-13	
V-93	TB	N	N	<u> </u>	N	WRR 12-4-13	
V-94	TEB_	N	- N	<u>N</u>	<u>N</u>	WER 12-9-13	
V-95	TEB	N	<u>N</u>	N	<u>N</u>	WRR 12-4-13	
V-96	TAB	N	<u>N</u>	<u></u>	<u>N</u>	WRR 12-9-13	
V-97	<u> </u>	<u></u>	N	<u>N</u>	<u>N</u>	ALL 12-4-13	
V-98	TeB	N	N	N	<u>N</u>	WRP 12-9-13	
V-99	TAB	<u>N</u>	N	N	<u>N</u>	WRR 12-9-13	
V-100	TAB	N	<u> </u>	<u>N</u>	<u> </u>	WRR 12-4-13	
V-101 V-102	TEB	<u> </u>	<u> </u>	<u>N</u>	<u> </u>	WRR 12-4-13	
V-102	TAB_	<u> </u>	<u></u>	<u>N</u>	<u> </u>	WER 12-9-13	
	Tib	<u>N</u>	Ň	<u>N</u>	N	WRR 12-9-13	
V-104	TeB	N	<u> </u>	<u>N</u>	N	WRP 12-4-13	
V-105	Tig	<u>N</u>	N	N	N	WRR 12-4-13	
V-106	TEB	<u> </u>	N	N		WRR 12-4-13	
V-107	Tib	N	<u> </u>	<u> </u>	<u>N</u>	NRR 12-14-13	
V-108	TEB		<u> </u>		<u>N</u>	WRR 12-19-13	

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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	TMI UNIT 1	TENDON A	NCHORAGI	E GREASE CAP	INSPECTIO	N
TENDON				EVIDENCE OF		INSPECTOR'S
ID	BUTTRESS	WATER	GREASE	DEFORMATION	CORROSION	DATE
			LEAKAGE *			
		YES/NO	YES/NO	YES/NO	YES/NO	
V-109	TIB		N	N	N	NPR 12-4-13
V-110	TEB	N	N	N	N	WRR 12.4.1
V-111	TEB	N	N	N	N	WRR 12-4-1
<u>V-112</u>	TEB	N	N	N	N	WR 124.13
<u>V-113</u>	TEB	N	N	N	<u>N</u>	WRR 12-4-1
V-114	TEB	N	N	<u>N</u>	N	WRR 12-4-1
V-115	TEB	N	N	N	<u>N</u>	WRP 124-1
V-116	TEB	A	N	N	N	WOR 12-4.1
V-117	TEB	Ň	<u>N</u>	N	N	WRR 12.41
<u>V-118</u>	TIB	N	N	<u>N</u>	N	WRR 12-4-1
V-119	TEB	N	N	N	N	WRR 12-4-1
V-120	TEB	N	N	<u>N</u>	N	WRR 12-4-1
V-121	TEB	N	N	N	N	NRR 12-4-19
V-122	TEB	N	N	N	N	WRR 12-4-1
V-123	TEB	N	N	N	N	NPR 12-4-15
V-124	TEB	N	N	<u>N</u>	N	WRR 12-4-1
V-125	TEB	N	N	N	N	WPK, 12-4-1
V-126	TEB	N	<u>N</u>	N	N	URK 12.41
V-127	TZB	N	N	N	N	WRR 12-4-1
V-128	TEB		N	N	N	WPP 12-4-1
V-129	1 728	N.	て	<u>N</u>	N	URR 12-4-1
V-130	TEB	N	N	N	<u>N</u>	WRR 12-4-13
V-131	TeB	N	<u>N</u>	N	N	WRK 12-4-1
V-132	TEB	N	Ń	N	N	HRR 12-4-1
V-133	TEB	N	N	N	N	WRR. 12.4.1
V-134	TIB	N	N	N	N	WRK 12-4-1
V-135	TEB	N	N_	N	N	WER 12-4-1
V-138	TEB	N	N	N	N	Well 12-41
V-137	TEB	N	N	N	N	WRR 12-4-1
V-138	TAB	N	N	N	N	WRR 12-4-1
V-139	TAB	N	N	N	N	WRR 12-4+
V-140	TIB	N	N	N	N	WR 12-4-1
V-141	TEB	N	N	N	N	NRR 12-4-1
V-142	TEB	N	N	N	N	WRR 12-4-1
V-143	TEB	N	N	N	Ň	WRR 12-4-1
V-144	TEB	1		N	N	WR 12-4-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.





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		TENDON A	NCHORAGE	GREASE CAP	INSPECTIO	N
TENDON ID	LOCATION OR BUTTRESS	Evidence of free water	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	YES/NO	YES/NO	** YES/NO	
V-145	TEB	N	N	N	N	NRE 12-4-13
V-146	TEB	N	N	AL	ÂJ	NRE 12-4-B
V-147	TEB	N	N	Ň	N	WRE 12-4-13
V-148	TEB	1	۸٢	N	N	WRR12-4-13
V-149	THB	N	Ň	At .	N	WRR 12-4-13
V-150	TEB	N	N	N	\wedge	NRR 12-4-13
V-151	TEB	N	ai	N	N	WRR 12-4-13
V-152		N	Ň	N	N	WRR 12-4-13
V-153	TEB	N	10	N		WRR12-4-13
V-154	TEB	N	<u>N</u>	N	N	NRE 12-4-13
V-155	TEB	<u>N</u>	N	N	<u>N</u>	WR2124-13
V-156	TEB	<u>N</u>	A	N	N	NRR 12-4-13
V-157	TER	N	N		N	WRLR-4-13
V-158	TEB			~	N	WRR124-13
V-159	TEB	N	<u>N</u>	N	<u>N</u>	WRE12-9-13
V-160	TEB	<u>N</u>	N N	N	N	WRR 124B
V-161	TEB	N	N	<u> </u>	N	WRR 12-4-13
V-162	TEB	<u>N</u>	<u> </u>	N	N	WER 12-413
V-163	TB	N	Ň	N	N	1468 12-4-13
V-164	TeB	N	<u>N</u>	N	N	hRR 12-9-13
V-165	TEB	N	N	N	<u>N</u>	ukk 12-4-13
V-166	TOB	N	N	N	N	URE 12-9-13
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* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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	TMI UNIT 1	TENDON A	NCHORAGE	E GREASE CAP	INSPECTIO	N
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	YES/NO	YES/NO	YES/NO	
D101 5W	E N.E.	N	N	N	N	4)RE 18-23-13
D102 🔬	- N.E.	N I	ASTISHY Y 4th	MIOZ. N	N	NRR 10-29-13
D103 SI	N-N.EI	N	I A A	「 N	N	NRR 10-23-13
D104 <	N-N.E.			Tand N	N	WRR 10-23-13
D105 🔨	W-NE	N N	53-15++ 4 < +2	W OZ N	N	WRR 10-23-13
D106	N-AIE	N	N	N	N	WER. 10-23-13
	W-NE	N	<u> </u>	<u>N</u>	N	WKR. 10.23-13
D108 S		<u>N</u>	<u>N</u>	N	N	WRR 10-23-13
	W-NE	N	<u>N</u>	N	N.	WRR 10-23-13
		N	N	<u>N</u>	<u>N</u>	WRR10-28-13
	N-NE	N	<u> </u>	N	N	WRR 10-23-13
	W-NE	N	<u>N</u>	N	N,	URR 10-23-13
	N-N.E	<u>N</u>	Y < HAW 207.	NE) N	<u>N</u>	WRR 10-23-13
	N-NE	N	N	N	<u>N</u>	WPP 10-23-13
	W-N.E.	N	Y < than 202.		<u>N</u>	WRR 10-23-13
	W-NE	N	N	<u>N</u>	N	WRR 10.23-13
	N-NE	N	<u>N</u>	N	N	WRP.10.23.13
D118 s		N	<u> </u>	N	N	NRR 10-2313
	W-NE	N	<u> </u>	<u>N</u>	N	NKR 10-23-13
	W-NE	<u>N</u>	<u> </u>	N	<u>N</u>	NRR 10-23-13
D121	W-NE	N	<u>N</u>	N	<u> </u>	WRR 10-23-13
D122 3	W-NE	<u>N</u>	<u>N</u>	<u> </u>	<u> </u>	NRR 10-23-13
D121	SW-NE	N	<u> </u>	N	<u>N</u>	WRR 10-23-13
D122	SW-NB	N		N	N	NRR 10:23-13
D123	SW-NE	N	Ň	<u>N</u>	N N	WRP 10-23-13 WRP 10-23-13
D124	SW-NE	N	 		<u>N</u>	
D125	SW-NE SW-NE	N N	N N	N	N N	WRR 10-23-13 WR WR1623-5
D127	AW-NE		N	<u> </u>	Ň	WRI LA-23-13
D128	SW-NE	N	Ň			WIR 10-23-13
D129	SW-NE	N	Ň	N N	N N	WRR 10.23-13
D130	SW-NE	N	N	N	N N	WRR 10-23-13
D131	SW-NE		N	N N		WER 10-25-13
D132	SW-NE	N	N N	<u></u>		WRR 10-23-19
D133	SW-NE	N.	Ň	N N	N.	WRR 10.23.13
D134	SWINE	N N		N N	1 2	WRR 10-23-13
		<u> </u>	<u> </u>	1 / 1 / 1	<u> </u>	LKAK IV LETI

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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	TMI UNIT 1	TENDON A	NCHORAGI	E GREASE CAP	INSPECTIO	N
	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
	DUTIKESS		LEAKAGE *	DEFORMATION	**	DATE
		YES/NO	YES/NO	YES/NO	YES/NO	
D135	SW-NE	N	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	N	N	NRR 10-23-13
D136	SW-NE	N	N	Ν	N	URR 10-23-13
D137	SW-NG	N	N	N	N	WRR 10-23-13
D138	SW-NE.	N	N	Al	A(WRR 10-23-13
D139	SWINE	N		N	N	WRR 10.23.13
D140	SN-NE	N	N	Ň	N	NRR 10-23-13
D141	SW-NE	N	N	N	N	WIRE 10-23-13
D142	SW-NE	N.	N	N	N	WRR 10.23-13
D143	SW-NE	N	N	Ň	- N	MRR 10-23-13
D144	SW-NE	N	N	N	N	WRR 10-23-13
D145	SN-NE	N	N	N	N	WRR 10-23-13
D146	SN-NE	N	~	N	N	WRR 10-23-13
D147	SW-NE	N	` N	N	N	WRR 10-23-13
D148	SW-NE	N	nl.	N	N	WRR 10-23-13
D149	SW-NE	N	Ň	N	N	WRR 10-23-13
D201	E-W		N	N	N	NRR 12-23-13
D202	E-N	N	N	N	Al	WRR 10-23-13
D203	E-N	<u> </u>	N	N	N.	4. RR. D. 23-13
D204	E-W	N	N	N	Ň	WRR 10.23-13
D205	E-W	N	N	<u>N</u>	N	WRR 10-23-13
D206	E-W	N	N	N	<u> </u>	WRR 10-23-13
D207	E-W	N	N	N	N	WRR. 10-23-13
D208	5-W	N	NN	N	N	WER 10-28-13
D209	E-W	N	NN	N	<u>N</u>	WER 10.23-13
D210	E-W	N	<u>N</u>	N	N	WRR 10-23-13
D211	E·W	N	<u>N</u>	N	N	WRR 10-25-13
D212	E-W	N	N	N	N	WRR 10-23-13
D213	E-N	~~~	N	N	N	WRR 10-23-13
D214	E·W	N	<u> </u>	N	N	WRR 10-28-13
D215	<u>E-M</u>	NN	<u>N</u>	<u>N</u> N	N	WRR 10-23-13
D216	E-N	N	<u>N</u>	N	N	WRR 10-23-13
D217	E-W	N	N	N	<u>N</u>	WRR 10.23-13
D218	E-W	NN	N	A	N	WRR 10-25-13
D219	E-W	<u> </u>	Ň	A	N	WRR 10-23-13 WRR 10-23-13
D220	Ê-W	N	N	N,	N	WKR 10-23-13
D221	E-W	<u>N</u>		<u> </u>	N	WRR 10-28-13

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** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.

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	TMI UNIT '	TENDON A	NCHORAG	E GREASE CAF	PINSPECTIO	N
TENDON	LOCATION OR	EVIDENCE OF FREE	EVIDENCE	EVIDENCE OF GREASE CAP	EVIDENCE	INSPECTOR'S
ID	BUTTRESS	WATER	GREASE	DEFORMATION	CORROSION	DATE
		VEONO	LEAKAGE *	VERNO	**	
	1	YES/NO	YES/NO	YES/NO	YES/NO	
D222	E-W	N	N	N	N	NRR 10-23-1
D223	E-N	N	N	N	N	WRR 10-23-1
D224	E-W	N		N	N	NRR 10-23-1
D225	E-W	N	N	N	N	WRR 10-23-1
D226	G-W	N	N	N	N	WRR 10.23-6
D227	E·N	N	N	N	N	WRR 10-23-1
D228	E·N	N	M		N	WRR 10-23-1
D229	EW	N ·	V 12 14 14" N	N	N	WRR 10.23-
D230	E-W	N	N APPIOL 20	7 N	N	WRR 10-23-1
D231	E-IN	N	N	N	Ň	WRR 10-23-1
D232	E-W	N	N	N	N	WRR 10-23-6
D233	E-W	N	N	N	N	NRR 10-29-1
D234	E-W	N	N	N	N	WR210-23-5
D235	E-W	Ň	N	N	N	NRR 10-23-1
D236	E-W	A A	N	N	N	WRR 10.234
D237	E-W	N	N	N	N	WRR 10-23-
D238	E-W	N	N	N	N	WRR 10-23-
D239	E-W	N	N	N	N	WRR 10-23-4
D240	E·N	N	7	N	N	WRR 10-23-6
D241	E-W	N	N	Ň	N	WRE 10-23-1
D242	E·W	N'	N	N	N	WRR 10-23-1
D243	F-W	N	N	N	Y(E) 249 40	WRE ID.23-1
D244	E-N	N	N	N	N Pitting	
D245	E-W	N	N	N	N	WER 10-23-1
D246	E-N	N	N	~	N	WRR 10-23-1
D247	E-W	N	N	N	N	WRR 1023
D248	E-W	N	N	N	- N	WRR 10-23-
D249	E-N	N	1 N		N	WRR 10.23.1
		<u> </u>	1			
D301	N-S	N	N	N	N	NRR 10-23-1
D302	N-5	N	N	N	N	NRR 10-23-1
D303	N-5	N	N	N	N	WRR 10-23-1
D304	N-5	N	N	N	N	WRR 10-23-
D305	N-5	N	N	N	N	WER 10-23-
D306	N-5	N	1 2	N	N	WRR 10-23-
D307	N-5	+ 7		N	N	WRR 10-25-

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.



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TMI UNIT	1 TENDON A	NCHORAGI	E GREASE CAF	INSPECTIO	N
		EVIDENCE	EVIDENCE OF	EVIDENCE	INS

TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	YES/NO	YES/NO	** YES/NO	
D308	N-S	N	N	N	N	WRR 10.23-13
D309	N-5	N	N	N	N	UPR 10-23-13
D310	N-5	_ NL		N	N	NPR 10-23-13
D311	N-3	N	N	N	N	WRR 10-23-13
D312	N-S	N	N		N	NRR 10-23-13
D313	N-S	<u>N</u>	N	N	N	WRR 10-23-13
D314	N-5	N	N	N	N	WRR 10-23-13
D315	N-S	_ N	N	N	N	WIZR 10-23-13
D316	N-S	N	N	N	N	WRR 10-23-13
D317	N-S	N	N	N	N.	WRR 10-23-13
D318	N-S	N	N	N	Ň	WRR 10-23-13
D319	N-S	N	N	N	N	ARR 10-23-13
D320	N-S	N	N	N		WPR 10-23-13
D321	N-S	N	N	N	N	WIRE 10.23-15
D322	N-S	N	N	N	N	WRR 10-23-13
D323	N-3	N	N	N	N	WRR 10-23-13
D324	N-5	N	N	N.	N	WRR 10-23-13
D325	N-S	N	N	N	N	WRR 10-23-13
D326	N-S	N	N	N	N	WRR 10-23-13
D327	N-S	A	N	N	N	URR 10-23-13
D328	N-S	N	N	N	N	NRP 10-23-13
D329	N-5	N	N	N		USRR 10-23-15
D330	N-S	N	N	N	N	ARR 10-23-13
D331	At-5	N	N	N	N	ARR 10-23-13
D332	N.S	N	N	N.	N	URR 10-23-23
D333	N-S	L N	N	N	N	NRR 10-23-13
D334	N-S	N	N	N	N	WER 60.23-13
D335	N-S	N	N	N	N	WRR 10-23-13
D336	N-5	N	N	N	N	NRR 10-23-13
D337	N-S	N	N	N	N	WRR 10-23-13
D338	N-S	N	N	N	N	WRR 10-23-13
D339	N-5	N	N	N	N	URE 10-23-13
D340	N-S	N	N	N	N	WRE 10.23-15
D341	N-S	N	Ň	N	N	ARR 10-23-13
D342	NS	N	N	N	N	WRI2 10-23-13
D343	A-5	N	N		N	WRR 10-23-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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TMI UNIT 1 TENDON ANCHORAGE GREASE CAP INSPECTION						
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	YES/NO	YES/NO	** YES/NO	
D344	N-S	N	N	AI.	N	NPP 10.23-13
D345	N-5	N	N	N	N	NRR 10-23-13
D346	N-5	N	N	N	N	12R10-23-1
D347	N-8	N	N	N	N	WRR 10-23-1
D348	N-5	N	N	N	N	WRR 10-23-19 WRR 10-23-1
D349	N-S		N	N	N	NRR 10-23-13
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* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.

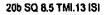


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	TMI UNIT 1	TENDON A	NCHORAGE	GREASE CAP	INSPECTION	1
TENDON	LOCATION	EVIDENCE OF FREE	EVIDENCE	EVIDENCE OF GREASE CAP	EVIDENCE OF	INSPECTOR'S INITIALS AND
ID	BUTTRESS	WATER	GREASE	DEFORMATION	CORROSION	DATE
1		YES/NO	LEAKAGE •	YES/NO	**	
		TEGINO	YES/NO	TESINO	YES/NO	
H13-1	B 1-3	N	N	N	N	WRP 11-20-13
H13-2	B 1-3	N.	N	N	Ν	WRR 11-20-13
H13-3	B 1-3	1A	N	N	N	NRC 11-20-13
H13-4	B1-3	A	N	N	N	WRR 11-20-13
H13-5	131-3	N	N	N	N	WRR.11-20-13
H13-6	13 1-3	N	N	N	N	WRR 11-20-13
H13-7	B 1-3	N	N	N	N	NRR 11-20-13
H13-8	<u>B 1-3</u>	N	N	N	N	WRR 11-26-13
H13-9	13 1.3	N	N	N	N	WRR 11-20-13
H13-10	<u>B 1-3</u>	<u>N</u>	N	N	N	WER 11-20-13
H13-11	B1-3	N	N	N	N	WRR 11-2413
H13-12	<u>B1-3</u>	N	N	N	N	MR 11-20-13
H13-13	B1-3	<u>N</u>	N	N	45	NRR 11-10-13
H13-14	31-3	N	N	<u>N</u>	<u>N</u>	WRR 11-20-13
H13-15	13.1-3	<u>N</u>	N	N	<u>N</u>	MRP 11-20-13
H13-16	13 1-3	N	N	N	N	HRR 11-20-13
H13-17	<u>B 1-3</u>	N	N	N	<u> </u>	WRR 11-20-13
H13-17	B1-3		N	N	N	WRR M1-20-13
H13-18	31-3	<u> </u>	N	N	<u>N</u>	WRP MADIS
H13-19	13 1-3	N	N	<u>N</u>	N	WRR 11-20-13
H13-20	13 1-3	<u>N</u>	N	<u>N</u>	N	WRP + 1-2013
H13-21	13 1-3	N	N	N	N	WRR 11-20-13
H13-22	B 1-3	<u>N</u>	N	A(N	WRR 11-20-13
H13-23	13 1-3	N	N	<u>N</u>	N	WRR 11-20-13
H13-24	B 1-3	N	<u>N</u>	N	N	WRC 11-20-13
H13-25	31-3	N	N	N	N	NRP 11-20-13
H13-26	<u>B1-3</u>	<u>N</u>	N	N	N	WRR 11-20-13
H13-27	131-3	N	<u>N</u>	N	N	WPP 11-20-13
H13-28	81.3	N	N	N		WC 11-12-13
H13-29	<u>B1-9</u>	<u> </u>	<u> </u>	N	<u>N</u>	WIT 11-20-13
H13-30	B 1-3	N	<u>N</u>	N	N	WRR 11-20-15
H13-31	31-3	N	<u>N</u>	N	N	NPR 11-20-13
H13-32	3 1-5	N	N	N	N	WRK N-20-13
H13-33	B/-3_		N	<u> </u>	N	W.R. 1-10-13
H13-34	131-3	N	<u>N</u>	N	<u>N</u>	WRR 11-20-13
H13-35	131-3	<u> </u>		N	N	NRR 1-2043

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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	TMI UNIT 1	TENDON A	NCHORAGE	E GREASE CAP	INSPECTIO	N
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	LEAKAGE * YES/NO	YES/NO	** YES/NO	
H13-36	B 1.3	N	N	N	N	NPR 11-20-13
H13-37	B 1-3	N	N	N	N	WRR 11-26-13
H13-38	3 1-3	_ NI	N	م. الم	N	WRP 11-20-15
H13-39	B 1-3	N	N	A	2	NRR 11-20-13
H13-40	B1-3	2	N	N	N	WRR 11-20-13
H13-41	81-3	2	N	N	_ N	WRR 11-20-13
H13-42	31-3	N	N	N	N	WRR 11-20-13
H13-43	B 1-3	N	N	Ń	N	WRR 11-20-13
H13-44	81-3	~	N	AI.	N	WRR 11-20-13
H13-45	B 1-3	ア	N	N	X	NRR 10-24-13
H13-46	B 1-3	N	N.	N	N _	WRR 10.24.13
H13-47	3 1-3	N	N	2	N	WRR 10.74.13
H13-48	13 1-3	N	N	N	N	WRR 10.24.13
H13-49	131-3	N	N	N	N	WRR 10.24-B
H13-50	13 1-3	N	N	N	N	WRR 10-24-13
H13-51	131-3	N	V APPNX SOL	N	N	11RR 10-24-13
H13-52	B 1-3	N	N I	N	N	WR 10-24-13
H13-53	B 1-3	N	AL.		N	WRR 10-0413
H13-54	B 1-3	N	N	Ń	N	WRR 10-29-13
H13-55	B 1-3	N	Y Approx 3	N	N N	WRR 10-24-13
			02 DIESUN			
H24-1	82.4	N	N	N	N.	WRR 12-4-13
H24-2	3 2-4	N	N	N	N	WRR 124.13
H24-3	13 2-4	N	N	N	N	NKR 12-4-13
H24-4	13 2.4	N	N	N	N	WRR 12.413
H24-5	B 2.4	N	N	N	Ň	WRR 12-4-13
H24-6	13 2.4	N	N	N	N	URR 12413
H24-7	B 2-4	N	N	N	N	WRR 12-4-13
H24-8	B 2.4	N	N	N	N	UNE 17-4-13
H24-9	B 2-4	N	N	N	N	NEP 12-4-13
H24-10	B 2-4	N	N	N	N	WRR 12-4-13
H24-11	13 2.4	N	N	N	N	NRC 12-4-13
H24-12	13 2-4	N	N	N	N	NPR 12-4-13
H24-13	13 2-4	N	N	N	N	NR 12413
H24-14	B 2-4	N	N.	N.	~	WER 12-4-13
H24-15	13 2.4	N	N	N	N	WER 12413

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.6 09/03/13 Page 8 of 20 Revision 0

TENDON ID LOCATION OR BUTTRESS EVIDENCE OF FREE YES/NO EVIDENCE OF GREASE LEAKAGE* EVIDENCE OF GREASE CAP DEFORMATION EVIDENCE OF GREASE CAP DEFORMATION INSPECTOR'S INITIALS AND DATE H24-16 B 2-4 N N N YES/NO """"""""""""""""""""""""""""""""""""		TMI UNIT 1	TENDON A	NCHORAGE	E GREASE CAP	INSPECTIO	N
H24-16 B 2-4 N		OR	OF FREE WATER	OF GREASE	GREASE CAP	OF CORROSION	INITIALS AND
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			YES/NO	YES/NO	YES/NO		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	H24-16	B 2-4	N	N	N	2	NRP 12-4.13
H24-18 B 2.4 N M N MRR $j_2/4/3$ H24-19 B 2.4 N A N N N MRR $j_2/4/3$ H24-19 B 2.4 N M N N N MRR $j_2/4/3$ H24-21 B 2.4 N N N N MRR $j_2/4/3$ H24-22 B 2.4 N N N N MRR $j_2/4/3$ H24-23 B 2.4 N N N N MRR $j_2/4/3$ H24-24 A 2.4 N N N N MRR $j_2/4/3$ H24-26 /B 2.4 N N N N MRR $j_2/4/3$ H24-26 /B 2.4 N N N N MRR $j_2/4/3$ H24-29 B 2.4 N N N N <t< td=""><td></td><td></td><td>N</td><td></td><td>N</td><td></td><td></td></t<>			N		N		
H24-20 B 2-4 N	H24-18		AI		N N	N	NRR 12-4-13
H24-21 B 2-4 N			N	AL	N	۸t	NPP 12-4-13
H24-22 (3) 2-4 (A) <	H24-20		N	N	N	N	WOR 12-413
$\begin{array}{c c c c c c c c c c c c c c c c c c c $			N	N	2	AF	WRR 12-4-13
H24-24 A </td <td>the second s</td> <td></td> <td></td> <td>N</td> <td></td> <td>Å</td> <td></td>	the second s			N		Å	
H24-25 3 2.4 N Al			Ň		N	N	NRR 12-4-13
H24-26 13 2-4 A A N N M27 12.4-13 H24-27 13 2-4 N N N N M27 12.4-13 H24-27 13 2-4 N N N N M27 12.4-13 H24-28 B 2-4 N N N N M274 13 H24-29 B 2-4 N N N N W274 13 H24-30 B 2-4 N N N N W274 13 H24-31 B 2-4 N N N N W274 12.4-13 H24-33 B 2-4 N N N N W272 12.4-13 H24-33 B 2-4 N N N N W272 12.4-13 H24-33 B 2-4 N N N N W272 12.4-13 <td></td> <td></td> <td><u>N</u></td> <td>N</td> <td></td> <td>N.</td> <td>WRR 12-4-13</td>			<u>N</u>	N		N.	WRR 12-4-13
H24-27 I3 2-4 N N N A M/R I <t< td=""><td></td><td></td><td></td><td></td><td></td><td><u>NI</u></td><td>WRR 12-4-13</td></t<>						<u>NI</u>	WRR 12-4-13
H24-28 B 2-41 N						N	
H24-29 B 2-4/ N				N	N		
H24-30 B 2-4 N		B 2.4					استابت استكابته مجدبة الإكرك السدير
H24.31 IS 2-4 N				a			
H24-32 B 2-4 N			••••••••••••••••••••••••••••••••••••••				a second distance of the local distance of the local distance of the local distance of the local distance of the
H24-33 B $2-4$ N N <th< td=""><td></td><td>and the second se</td><td></td><td></td><td></td><td></td><td></td></th<>		and the second se					
H24-34 B 2-4 N					1		
H24-35 B 2-4 N							
H24-36 B 2-4 N N N N W/R 12-4-13 H24-37 B 2-4 N N N N N M W/R 12-4-13 H24-37 B 2-4 N N N N N M W/R 12-4-13 H24-38 I3 2-4 N N N N M M W/R 12-4-13 H24-39 B 2-4 N N N N M M M M/R 12-4-13 H24-39 B 2-4 N N N N M M/R 12-4-13 H24-40 B 2-4 N N N N M/R 12-4-13 H24-41 I3 2-4 N N N N M M/R 12-4-13 H24-42 I3 2-4 N N N N M/R 12-4-13 H24-43 JS 2-4 N N N N N <							
H24-37 G 2-4 N	and the second se						
H24-38 IS Z-4 N							
H24-39 B 2-4 N				T			
H24-40 B 2-4 N							
H24-41 3 $2-4$ N N N N M							
H24-42 3 $2-4$ N N N N M							
H24-43 B Z-4 N				1	<u> </u>	1	
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H24-46 B Z-4 N		_ /.					
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	the second s						
H24-48 B 2-4 N N N N N N N R R R ID-24-B					· · · · · · · · · · · · · · · · · · ·		
H24-49 B 2-4 N N N N N N N N N N N N N N N N N N N							
H24-50 13 2-4 N N. N							
	H24-51	B 2-4	N	<u> </u>	<u> </u>	1	WRR 10-24-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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	TMI UNIT	TENDON A	NCHORAGI	E GREASE CAP	INSPECTIO	N
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER YES/NO	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION YES/NO	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
			YES/NO	120/110	YES/NO	
H24-52	<u>B 2-4</u>	N	N	N	N	WRR 10.24-13
H24-53	B 2-4	N	N	N	N	WRR 10-24-13
H24-54	B 2-4	N	N.	N	N	WRR10-24-13
H24-55	<u>B 2-4</u>	N	N	N	N	WRR 10-24-13
H35-1	B 3-5	N	N	N	N	NRR 10-24-19
H35-2	8 3 - 5	N	N	N	N	NRP 10-24-13
H35-3	83.5	N	N	N	N	WRR 10-24-13
H35-4	B 3.5	N	N	N	A	NRR 10-24-13
H35-5	B 3.5	N	N	N	N	NRR 10-14-13
H35-6	B 3-5	N	N	N	N	WRR 10-24-13
H35-7	3 3.5	N	N	N	N	412R D-24-13
H35-8	13 3.5	N	N	N	N	WRR 10-24-13
H35-9	B 3-5	N	N	N	N	WRR 10-24-13
H35-10	B 3-5	N	N	N	Ň	NRR 10-24-13
H35-11	\$ 3.5	N	N	N	N	WRR 10-24-13
H35-12	13 3-5	N	N	N	N	WRR 10-24-13
H35-13	R 3-5	N	N	N	N	WER 10.24-13
H35-14	B 3-5	N	N	N	AL	WRR 10-2413
H35-15	37-5	N	Ň	N	N	WRR 10-24-13
H35-16	B 3-5	N	N	N	N	WRP 10-24-13
H35-17	13 3-5	Ń	N	N	N	WKE 10-24-13
H35-18	13 3-5	N	N	N	N	WRR 10-2415
H35-19	13 3-5	N	N	N	N	ANCR 10.29-13
H35-20	B 3-5	N	N	N	N	NRR 10-24-13
H35-21	B 3-5	N	N	N	N	WRR 10-24-13
H35-22	13 3-5	N	N	N	N	WER10-24-13
H35-23	B 3-5	N	Ň	N	N	AIRE 10-29-13
H35-24	B 3.5	N	×	Ň	N	AVER 10.24-13
H35-26	3 3-5	N	N	N N	N	NRR 102413
H35-25	B 3-5	N(+)8-5		N	······	WRR 10-24-13

Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

has a small div. than 202 of grase/oil leaked outo the bearing plate and wall below. Budfress 3 and is good. 20b SQ 8.5 TMI.13 ISI





N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 10 of 20 Revision 0

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	TMI UNIT 1	TENDON A	NCHORAGE	E GREASE CAP	INSPECTION	N
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	LEAKAGE * YES/NO	YES/NO	++ YES/NO	
H35-27	B 3.5	N	N	N	N	WRR 1024.13
H35-28	B 3-5	N	N	N .	N	NRR 10.2413
H35-29	3 3.5	٨J	N	N	N	WRR 10-24-13
H35-30	3 3-5	N	N	A	Ň	WRR 10.24-13
H35-31	B 3.5	AC	N	N	N	WRL 10-24-13
H35-32	B 3.5	N	N	N	N	WRR10-24-13
H35-33	B 3-5	N	N	N	Ň	WRR 10.24-13
H35-34	B 3.5	N	N	, il	N	4RR D.74-13
H35-35	13 3.5	N	N	Ň	N	NRR 10-24-13
H35-36	B 3-5	N	N	N	N	MRR.10-24-13
H35-37	B 3.5	N	N	N	N	WRR 10-24-13
H35-38	B 3-5	N	N	N	N	NRR 10-24-13
H35-39	3 3-5	AI .	N	N	Ń	WRR 10-24-13
H35-40	B 3-5	N	N	N	N	WRR 10-24-13
H35-41	13 3.5	N	N	N	N	WRR 10-24-13
H35-42	8 3.5	N	N	N	AL	NER 10-24-13
H35-43	13 3-5	N	N	N	Al	JRR 10-24-13
H35-44	B 3-5	N	N	N	A A	NRR 10-24-13
H35-46	B 3.5	N	N	N	N N	WRR 10-24-13
H35-47	13 3-5	N	N	N	Ň	WRR 10-24-13
H35-48	83-5	N	N	N	N	WRR 10-24-13
H35-49	133.5	N	N	N	1	WRR 10-24-13
H35-50	B 3.5	N	N	AL N	N	NPR 10-24-13
H35-51	B 3.5	N	N	Ň	N	NRP 10-24-13
H35-52	B 3-5	N	N	N	N	WRR 10-24-13
H35-53	13 3-5	N	N	N	Ň	NRR 10-29-13
H35-54	B 3-5	N	N	N	Ń	WRR 10-24-15
H35-55	13 3-5	N	Ň	N	Ń	WRR 10-24-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 11 of 20 Revision 0



	TMI UNIT 1	TENDON A	NCHORAGI	E GREASE CAP	INSPECTIO	N
TENDON ID	LOCATION OR BUTTRESS	Evidence of Free Water	EVIDENCE OF GREASE LEAKAGE *	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	YES/NO	YES/NO	++ YES/NO	
H46-1	B 4-6	N	N	N	N	WRR 12-4-13
H46-2	8 4-6	N	N	N	N	JPR 12-4-13
H46-3	B 4-6	N	N	N	N	WER 12-4-13
H46-4	B 4-6	N	N	N	N	WRR 12-4-13
H46-5	B 4-6	N	N	Ν.	N.	WRP 12-4-13
H46-6	\$ 4-6	N	Ň	N		WRR 12-4-13
H46-7	B 4-6	N	N	N	N	NRR 10-84-13
H46-8	13 4-6	N	N	N	N	WER10-24-13
H46-9	B 4.6	N	N	N	N	WPP 10-24-13
H46-10	13 4-6	N	<u>N</u>	<u>N</u>	N	WRR 10-24-13
H46-11	8 4-6	N	N	N	<u>N</u>	WRP 10-24-19
H46-12	B 4-6	N	<u>N</u>	<u>N</u>	N	WRP 10-24-13
H46-13	B 4-6	N	<u>N</u>	N	N	WRR 10-24-13
H46-14	13 4.6	N	N	N	N	WAR 10-24-19
H46-15	13 4.6	N	N	<u> </u>	N	WRR 10-24-13
H46-16	B 4-6	N	N	A .	N	WB2 10-24-13
H46-17	<u>B 4-6</u>	N	N	N	N	WRR10-24-13
H46-18	13 4.6	N	N	N	N	WRR 10-24-13
H46-19	B 4-6	Ň	N	<u>N</u>	N	NRR 10-24-13
H46-20	B 4.6	<u> </u>	N	N	N	WRR 10-24-13
H46-21	B 4-6	<u>N</u>	N	N	N	WRR 10-24-13
H46-22	<u>B 4-6</u>	<u> </u>	<u>N</u>	<u> </u>	N	WRR 10-24-13
<u>H46-23</u>	<u>B 4.6</u>	A	N	<u> </u>	<u>N</u>	WRR 10-24-13
H46-24	B 4-6	<u>N</u>	<u>N</u>	N	N	WER 10-24-13
H46-25	13 4-6	N	<u>N</u>	N	N	NRR 10.24-13
H46-26	B 4-6	N	N	N	N	4RR 10-24-13
H46-27	B 4-6	N	N	N	N	WRR 10-29-13
H46-28	13 4-6	N	N	N	<u> </u>	ARE 10-24-13
H46-29	B4-6	4	<u> </u>	N	- N-	LIRE 10-24-13
H46-30	3 4-6	N	<u> </u>	N		NRR 10-24-13
H46-31	B 4-6	N	· N.	N	N	NPL 10-24-13
H46-32	<u>B 4-6</u>	AL	<u>N</u>	N	N	WRR10-24-13
H46-33	B 4-6	Ň	N	N	N	WRR 10-24-13
H46-34	13 4-6	N	<u>N</u>	Ň	N	WRR 10.24+3
H46-35	13 4-6	AI	N	<u>N</u>	<u>N</u>	WRR 10-24-13
H46-36	B 4-6	A	N	N		WRR 10.2413

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.

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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 12 of 20 Revision 0

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		TENDON A	NCHORAGE	E GREASE CAP	INSPECTION	1
	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
	BUILKESS	WATER	GREASE	DEFURINATION		
1		YES/NO	LEANAGE	YES/NO	**	۱. I
			YES/NO		YES/NO	
H46-37	B 4-6	N	N	N	N	NRR 10-24-B
H46-38	B 4-6	N	N	N	N	WRR. 10-24-13
H46-39	B 4.6		N	N	22	WRR D.74-13
H46-40	B 4-6	N	N	_ N		WER 10-2413
H46-41	B 4.6	N	d	_ A	N	WRR 0-24-13
H46-42	B 4-6	N	N	<u>A</u>	N	WRR 10-24-13
H46-43	B4-6	N	N	N	N	URR 10-24-13
H46-44	B4-6	Ň		<u>N</u>	N	WRE 10-24-13
H46-45	B 4-6	N	l	N	N	NRR 10-24-13
H46-46	B 4-6	N	N	N	N	WRE10-24-13
H46-47	<u>13 4-6</u>	N	<u>N</u>	<u> </u>	N	WRR 10-24-13
H46-48	B 4-6	N	A	N	N	NRP 10-24-13
H46-49	B 4.6	N	N	N	N	WRR 10-24-13
H46-50	84-6	N	N.	N	N	WER 10-24-13
H46-51	B 4-6	N	N		N	WRR 10-24-13
H48-51	B 4-6	N	N	N	N	NRP.10-24-13
H46-52	B 4-6	N	N		N	WER 10-24-03
H46-53	B 4-6	N	N	N	N	WRR 10-2413
H46-54	B 4-6	N	N	N.		WRR 10-24-19
H46-55	B 4-6	N	N	M		WRR 10-24-13
		1	ļ	<u> </u>	<u> </u>	<u> </u>
H51-1	B 5.1		N.	N	N	NRP 11-20-13
H51-2	13 5.1	Ň	Ň	N	N	WRR 11-20-13
H51-3	13 5.1	N	N	N	N	NPR 11-20-13
H51-4	3 5-1	N	N	N	N	WRR 1+20-13
H51-5	B 5-1	N,	N	<i>∧</i>	N,	WRR 11-20-13
H51-6	13 5.1	N		N		WRR 11-20-13
H51-7	3 5-1	N	N	A!	N	WRR 10.24-13
H51-8	<u>B 5.1</u>	N	N	Ň	N	WRR 10-24-13
H51-9	<u>B 5-1</u>	N	<u>N</u>	Ń		WRR 10.24-13
H51-10	13.5-1	N	<u>N</u>	<u>N</u>	<u>N</u>	WRR 10-24-13
H51-11	B 5.1	N	<u>N</u>	N	N	WRR 10.24-13
H51-12	B 5.1	<u> </u>	N	N		NRR 10-24-13
H51-13	13 5-1	N	N	N	N	NRE 10-24-13
H51-14	B 5-1	N	N	N	N	NRR 10.24-13
H51-15	13-5-1	N	N	<u> </u>		NRR 10-24-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

** This is evidence of corrosion that resulted in metal loss and wastage that may affect the ability of the grease cap to contain the sheathing filler grease.



N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 13 of 20 Revision 0

	TMI UNIT	TENDON A	NCHORAGI	E GREASE CAP	INSPECTIO	N
TENDON	LOCATION	EVIDENCE OF FREE	EVIDENCE	EVIDENCE OF GREASE CAP		INSPECTOR'S
ID	BUTTRESS	WATER	GREASE	DEFORMATION	CORROSION	DATE
		YES/NO	LEAKAGE *	YES/NO	A a	
		1 LOATO	YES/NO		YES/NO	
H51-16	13 5-1	N	N		t	NRR 10-24-13
H51-17	8 5.1	N	N	N	N	WRR. 10.2413
H51-18	B 5-1	N	Ň	N	N	WRP 10-24-13
H51-19	B 5.1	N	N	N	N	URP 10-24-13
H51-20	B 5.	N	N	N	N	WRL 10-24-13
H51-21	13 5-1	N	N	N	N	NPR 10-2413
H51-22	13 5-1	<u>N</u>	N	N	N	WRR.10.24-13
H51-23	13 5-1	N	N N	N	N	WRR 10:24-13
H51-24	8 5-1	N	N	N	Ń	WRE 122-13
H51-25	135-1	N	N	<u>A</u>	A	NRR 10-24-1
H51-26	B 5-1	N	N	N	N	JIRR 10-24-13
H51-27	B 5-1	N	N	N	Ń	NRC 10-24-13
H51-28	B S-1	N	N	N	N	NRF 10-24-13
H51-29	B 5-1	N	N	N	A.	WRR 10-2413
H51-30	B 5-1	N	N	N	N	NRR P.24.
H51-31	B 5-1	N	N	N	N	WRR 10-24-13
H51-32	B 3-1	N	N	. N	N	WRR 10-24-13
H51-33	B 5-1	N	N	N	N	WRR 10-24-19
H51-34	B 5-1	Ň	N N	N	Ň	NRR 10-24-19
H51-35	13 5-1	N	N	14	N	WRR 10-24-13
H51-36	13 5-1	N	N	N	N	UPR 10-24-1
H51-37	B 5.1	N	N	N	N	WRR 10-24-1
H51-38	15 5-1	N	N	N	N	WRR 10-24-1
H51-39	B 5-1	N	5	N	N	NRR 10-24-1
H51-40	B 5.1	N	N		N	WRK 10-29-1
H51-41	13 5.1	N	N	N	N	WRR 10-24-1
H51-42	13 5-1	N	N	N	N	WRR 10.24-1
H51-43	B 5.	N _	N	N		URP 10-24-1
H51-44	13 5.1	d	N		N	NRR 10-24-1
H51-45	13 5-1	Ň	Ň	Ň	N	NRE 10-241
H51-46	13 5-1	N N	N	N	N	HRR 10-24-1
H51-47	13 5-1	N	N	N	N	WER 10-24-
H51-47				N N		ARE 10-24-1
H51-40			<u> </u>	N		WRR 10-24-1
				N N		WRR 10-24-1
H51-50 H51-51	13 5·1 B 5-1	<u>N</u>	<u>N,</u>	N N		WRR 10-24-1

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.

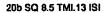




N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 14 of 20 Revision 0

			NCHORAGI	E GREASE CAP	INSPECTION	<u>v</u>
TENDON ID	LOCATION OR BUTTRESS	EVIDENCE OF FREE WATER	EVIDENCE OF GREASE	EVIDENCE OF GREASE CAP DEFORMATION	EVIDENCE OF CORROSION	INSPECTOR'S INITIALS AND DATE
		YES/NO	LEAKAGE *	YES/NO	** YES/NO	
H51-52	B 5.1	N	N	N	N	WRR 10-24-13
H51-53	B 5-1	N	Ň	N	N	WRR 10.24.13
H51-54	<u>B 5-1</u>	N	N	N	<u>N</u>	NRR 10-24-13
H51-55	B 5-1	N	N	N	N	NRR 10-24-13
H62-1	B 6-2	N	<u>N</u>	N	N	NRC 11-20-13
H62-2	8 6.2	N	N	N	N	W221-20-13
H62-3	B 6-2	<u>N</u>	N	N	N	W2R61-20-B
H62-4	B 6-2	N	<u>N</u>	N	<u>N</u>	WRR 11-20-13
H62-5	B 6-2	N	<u>N</u>	N	<u>N</u>	NRP.11-20-13
H62-6	B 6-2	N	N	N	N	WRR. 11-20-13
H62-7	13 6-2	N	N		<u>N</u>	WRR 10-24-13
H62-8	B 6.2	N	<u> </u>	<u>N</u>	<u> </u>	NRR 10.24-B
H62-9	B 6-2	N	<u>N</u>	N	N	WRR 10-24-13
H62-10	<u>B 6-2</u>	N	<u> </u>	N	N	WRR 10-24-13
H62-11	B 6-2	N	<u>N</u>	N	N	NRR 10-24-13
H62-12	B 6-2	N	<u>N</u>	<u>N</u>	N	WRR 10-29-13
H62-13	B 6-2	N	<u> </u>	N	N	URP 10-24-15
H62-14	13 6.2	<u> </u>	N	N	N	WRR 10-24-13
H62-15	<u>B 6-2</u>	N	N	N	N	WRR 10.2413
H62-16	<u>B 6.2</u>	N	<u> </u>	<u>N</u> ,	N	WRR, 10-24-13
H62-17	B 6-Z	<u>N</u>		N	N	WOL 10-14-15
H62-18	<u>B 6-2</u>	N	N	N	N	NRR 10-14-13
H62-19	B 6.2	N	<u>N</u>	<u>N</u>	N	URP 10-24-13
H62-20	B 6-2	<u>N</u>	<u>N</u>	<u>N</u>	N	NRE 10-24-13
H82-21	86.2	N	N	N	<u>N</u>	11RR 10-24-13
H62-21	B6-2	N,	N	<u>N</u>	<u>N</u>	NRR 10-21-13
H62-22	B 6-2	N	N	N	<u>N</u>	WRR D-24-13
H62-23	66.2	<u> </u>	<u>N</u>	N	<u> </u>	NPP 10-29-13
H62-24	<u>B 6-2</u>	<u>N</u>	<u> </u>	N	<u>N</u>	WRP 10-24-63
H62-25	<u>B 6-2</u>	N	<u>N</u>	<u>N</u>	N	NRR 10-24-13
H62-26	<u>B6-2</u>	<u> </u>	N	N	N	WRR 10-24-13
H62-27	B 6-2	<u>N</u>	<u>N</u>	<u>N</u>	<u>N</u>	WRR O-ZA13
H62-28	<u>B 6.2</u>	N	N	<u> </u>	N	WREW-24-3
H62-29	36-2	N	N	N	<u> </u>	WRR10-24-13
H62-30	B 6-2	<u>N</u>	<u> </u>	<i>N</i>	<u> </u>	NKR 10-24-13

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.



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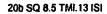
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N1091 PSC PROCEDURE SQ 8.5 GREASE CAP INSPECTION Data Sheet 8.5 09/03/13 Page 15 of 20 Revision 0



ID BI H62-31 E H62-32 E H62-33 E H62-35 E H62-36 E H62-37 E H62-38 E H62-39 E H62-39 E	UTTRESS $6 \cdot 2$ $6 \cdot 2$	EVIDENCE OF FREE WATER YES/NO N N N N N N N N N N N N	EVIDENCE OF GREASE LEAKAGE * YES/NO A) A N N N N N N N N N N	EVIDENCE OF GREASE CAP DEFORMATION YES/NO N N N N N N N N	EVIDENCE OF CORROSION ** YES/NO N N N N N N	INSPECTOR'S INITIALS AND DATE NEP 10-24-13 NEP 10-24-13 NEP 10-24-13 NEP 10-24-13 NEP 10-24-13 NEP 10-24-13
H62-32 H62-33 H62-34 H62-35 H62-35 H62-36 H62-37 H62-37 H62-38 H62-39 H62-40 H62-40 H62-41	$6 \cdot 2$ $6 \cdot 2$ $6 \cdot 2$ $3 \cdot 6 \cdot 2$	N N N N N N N		N N N N N	2 2 2 2 2 2 2 2	WER 10-24-13 WER 10-24-13 WER 10-24-13 WER 10-24-13 WER 10-24-13
H62-32 H62-33 H62-34 H62-35 H62-36 H62-36 H62-37 H62-38 H62-39 H62-40 H62-40 H62-41	$6 \cdot 2$ $6 \cdot 2$ $6 \cdot 2$ $3 \cdot 6 \cdot 2$	N N N N N N N		N N N N N	2 2 2 2 2 2 2 2	WER 10-24-13 WER 10-24-13 WER 10-24-13 WER 10-24-13 WER 10-24-13
H62-33 H62-34 H62-35 H62-35 H62-36 H62-37 H62-38 H62-39 H62-40 H62-41 H62-41	6-2 6-2 3 6-2 3 6-2 3 6-2 3 6-2 3 6-2			ス ス ス ス ス	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	WRR 10-24-13 WRR 10-24-13 WRR 10-24-13 WRR 10-24-13
H62-34 H62-35 H62-36 H62-37 H62-37 H62-38 H62-39 H62-40 H62-41	6-2 3 6-2 3 6-2 3 6-2 3 6-2 3 6-2 3 6-2	N N N N N		N N N N	N N N	WRR 10.24.13 WRR 10.2413 WRR 10.2413
H62-35 H62-36 H62-37 H62-38 H62-39 H62-40 H62-41	3 6-2 3 6-2 3 6-2 3 6-2 3 6-2 3 6-2	N N N N	N N N N	N N N	N N	WRR 10.24-13
H62-37 H62-38 H62-39 H62-40 H62-41	3 6·2 3 6·2 3 6·2 3 6·2	N N N	A) Al	Ň	N N	WRR 10-24-19
H62-38 H62-39 H62-40 H62-41	3 6.2 3 6.2 3 6.2	N N	t	N	N	, DA to ab to
H62-39 H62-40 H62-41	3 6.2	N	t	•		NRE 10-24-17
H62-40 /	3 6-2			i	N	WRR 10-24-19
H62-41			<u>N</u>	N	N	NEL ID XII
1100 10	A	N	N	Ň	N	WRE 10-241
H62-42	B 10-2	N	N	N	N	WRR 10-24-1
	3 6-2	N	N	N	N	WER. 10-241
	3 6-2	N	Al	N	N	NRE 10-24-1
	3 6.7	N	N	N	N	WR 1024-1
	36.2	N	<u> </u>	<u>N</u>	N	WRP. 10-24-13
	<u>B 6-2</u>	<u>N</u>	N	Ň	<u>`N</u>	WEE D-24-13
	3 6.2	<u>'N</u>	N	N	N	WER 24-13
	3 6-2	N	N	N	N	WER-124-19
the second s	8 6-2	N	N	<u>N</u>	N	WRE 10-24-13
	36.2	<u> </u>	N	<u>N</u>	N	WER D-24-1
	<u>B 6.2</u>		<u>↓</u>	N	N	WER 10-24-3
	3 6-2		<u> </u>	<u> </u>	<u> </u>	WRR 10-29-5
		and the second	<u>N</u>	N	<u>N</u>	NRL 10-29-1
H62-55	<u>B 6-2</u> 13 6-2	<u> </u>	N	<u>N</u>	N	WRRID-24-1
<u>102-00</u>	13 6-2	<u>↓</u> ∧	N	N	N	WRR10-24-1

* Evidence of oil at threaded connection is acceptable providing it is not excessive. This is oil that has separated from grease and is common.



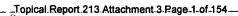
ATTACHMENT 3

Exelon Approval of PSC Procedures and Personnel

Table of Contents

1.	Designation of Responsible Engineer	p02
2.	Approval of PSC Surveillance Procedure N1091 Revision 0	p03
3.	Approval of PSC Surveillance Procedure N1091 Revision 1 of SQ 8.0 And Inspection	horage p07
4 .	Approval of PSC Quality Control Inspector Rance Robbins and Clinton We	est p10
5.	Approval of PSC Quality Control Inspector Ronald Perry	p11
6.	Vendor Qualification Records	p12

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Memorandum

Date:	March 28, 2014
То:	File
Cc:	Topical Report 213 Mark Torborg John Piazza Sean Taylor
From:	Michael Grimm
Subject:	Documentation of Responsible Engineer for TMI Pre-stressed Containment Inspection

No. of Pages: 1

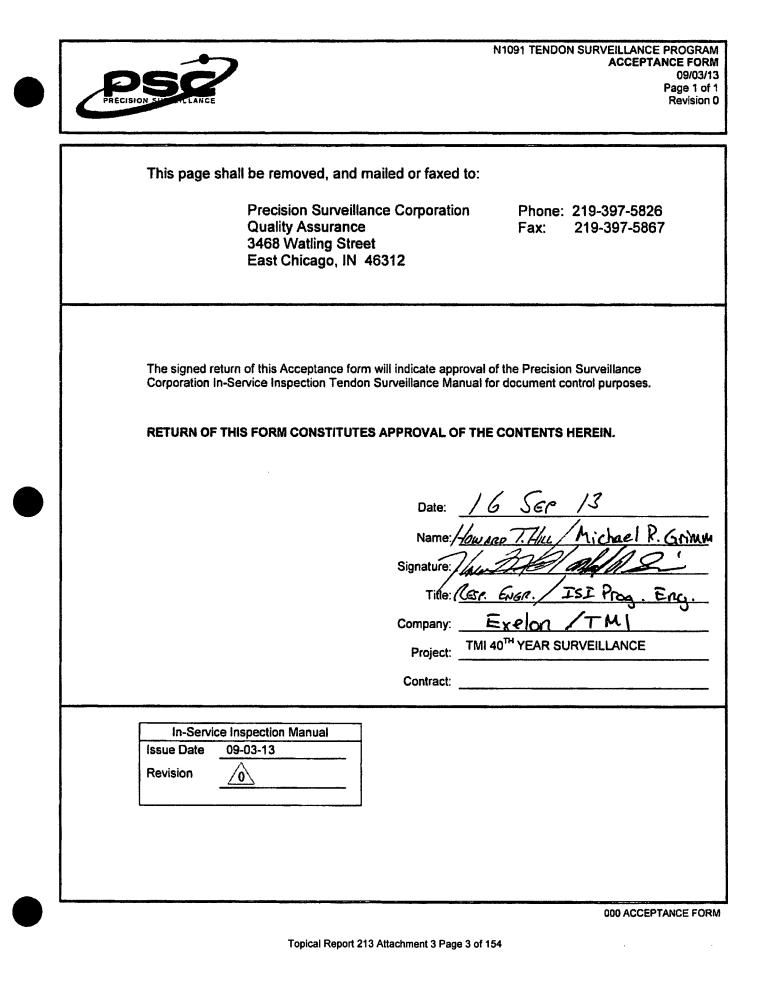
This memorandum serves to document that Howard Hill; P.E. (CA license # C22265) has been designated as the Responsible Engineer (R.E.) for the Three Mile Island Nuclear Generating Station's 40th year In-Service Inspection of the Unit 1 Reactor Building Prestressed Containment System. Mr. Hill's qualifications have been reviewed and determined to meet the requirements set forth by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Subsection IWL, 2004 edition no addenda. Mr. Hill's responsibility for serving in this capacity is documented and outlined in Exelon Generation Contract number 502247.

Michael Grimm, ISI Program Engineer

all's

Mark Torborg, Manager - Programs Engineering

IAD



N1091 TENDON SURVEILLANCE PROGRAM ACKNOWLEDGEMENT OF RECEIPT FORM 09/03/13 Page 1 of 1 Revision 0

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The individual acknowledging receipt will be considered the permanent holder of this manual. For more information regarding responsibility of the attendant of this manual, refer to the Manual Control Policy Statement.	Date of Submittal: Date of Receipt: Name: Signature: Title: Company: Project: Contract:	<u>9/16/2013</u> Michael R. Grimm
In-Service Inspection Manual Issue Date 09/03/13 Revision 0	-	

PRECISION SP

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DATA SHEET 17 Review / Acceptance of Contractor Procedures

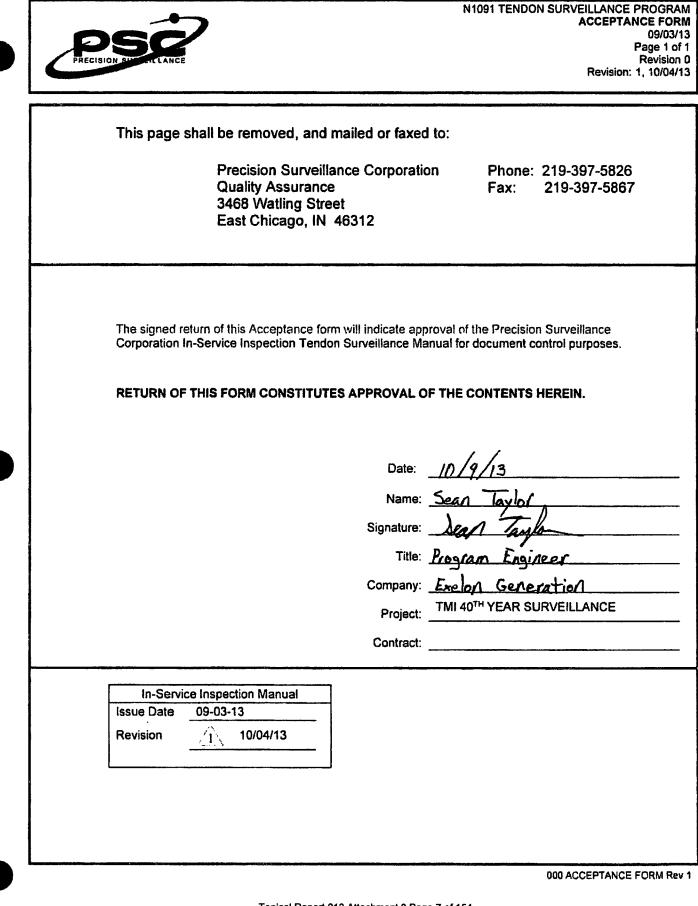
Procedure Number / Title	Revision	Reviewed/Accepted by	Date
Manual Control Policy	0	no al	9/16 /2013
Definitions	0	MOR 1200	
PS 1.0 – Personnel Safety	0	MAR 1966	
SQ 1.0 - Surveillance Purpose	0	mal 1	2
SQ 2.0 – Surveillance Scope	0	mas 200	
SQ 3.0 - Construction Eq. List	0	mal 2	,
SQ 4.0 - Q.C. Eq. List	0	MS170	>
SQ 5.0 – Prerequisite Checklist	0	asia	
SQ 6.0 - Grease Cap Removal	0	nB LACO	
SQ 6.1 - Inspect for Water	0	ma jalo	
SQ 6.2 - Water Sample Analysis	0	MR 2	
SQ 7.0 – Sheathing Filler Analysis	0	malle	
SQ 7.1 - Thread Measurement	0	mall	
SQ 8.0 - Anchorage Inspection	0	MB LAR	
SQ 8.3 – Bearing Plate Concrete Insp.	0	m281200	
SQ 8.4 - Concrete Exterior	0	on La	
SQ 8.5 – Anchorage Cap Insp.	0	me sel	
SQ 9.0 – Monitor Tendon Force	0	MA LACIO	
SQ 9.1 – Prestress Forces	0	marial	
SQ 10.0 - Detension Tendon	0	MAS LAC	
SQ 10.1 – Detension Anchorage Insp.	0	ma jal	,
SQ 10.2 - Test Wire Removal	0	mB LAC.	
SQ 10.3 – Testing Tendon Wires	0	mas 120	
SQ 10.5 - Continuity Test	0	MB-1201	,
SQ 11.0 - Retension Tendons	0	MB 120	4
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DATA SHEET 17 Review / Acceptance of Contractor Procedures

Procedure Number / Title	Revision	Reviewed/Accepted by	Date
SQ 11.1 - PSC Engineering Data	0	118 120	9/16/2013
SQ 12.0 – Grease Cap Replacement	0	12 120	}
SQ 12.1 – Grease Replacement	0	MB ME	
SQ 12.2 – Grease Volumes	0	all 17	
QA 1.0 - Program Purpose	0	MA DE	
QA 2.0 - Program Scope	0	MB 121	
QA 3.0 - Quality Organization	0	M& 176	
QA 4.0 - Q.C. Responsibility	0	11/20	
QA 4.1 - Personnel Qualifications	0	MAL 200	
QA 5.0 Personnel Training	0	MAS 174	••••••••••••••••••••••••••••••••••••••
QA 6.0 - Procurement	0	MB 12	
QA 7.0 - Field Change Request	0	AR 1 24	
QA 8.0 - Document Control	0	MR 12	
QA 8.1 – Revision Control	0	12/18/110	
QA 9.0 - Nonconformances	0	M8-120,	
QA 10.0 - Calibrations	0	MB 126	
QA 10.1 - Calibration Verification	0	11/28/24	
QA 11.0 – Q.C. Inspection	0	MIS 176	
QA 12.0 - Audits	0	MOR 1 200	



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PRECISION ELECTRANCE		N1091 TENDON SURVEILLANCE PROGR/ ACKNOWLEDGEMENT OF RECEIPT FOF 09/03/ Page 1 o Revision Revision: 1, 10/04/
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receipt will be considered the permanent holder of this manual. For more information regarding responsibility of the attendant of this manual, refer to the Manual Control Policy Statement.	Date of Receipt: Name: Signature: Title: Company: Project:	Sen Taylo- Program Engineer EXELON
receipt will be considered the permanent holder of this manual. For more information regarding responsibility of the attendant of this manual, refer to the Manual	Date of Receipt: Name: Signature: Title: Company: Project:	Sun Taylo- Program Engineer EXELON
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1301-9.1 Revision 23A Page 21 of 21

DATA SHEET 17 Review / Acceptance of Contractor Procedures

	Procedure Number / Title	Revision	Reviewed/Accepted by	Date
50	8.0 - Anchorage Inspect	ion 1		10/9/13
				
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1301-9.1 Revision 23 Page 20 of 21

DATA SHEET 16 Examiner Qualification

Name of Examiner	Employer	Method	Level
W. RANCE (COBRINS	PSC	GGERAL + DETRILED VEUNC	$\underline{\mathcal{I}}$
W. RANCE CORAINS LINTON WEST	<u>Csc</u>	GENERAL + DETRILED VISUAL	
	······································		
		900	. <u></u>

I have reviewed the records relevant to the experience and training of the above named individuals and have, as necessary, trained these individuals in the requirements applicable to the performance of visual examinations of the containment concrete surface. Based on this review and, if applicable, training, I find that these individuals are qualified to perform said examinations.

qualities to perform sale exami	mauons.	
Responsible Engineer:	Name HOWARD T. HILL	
	Registration <u>CA</u> <u>C22265</u> <u>30</u> State License No.	SEP 15 Expiration
	Signature	16 SEC 12
Exelon NDE Services Concurr	Pence James & Jewonle Lames, L. NEW JONB TE / LTT	Date 9/17/13
ANII Concurrence	Agent At	Date 9/17/13

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1301-9.1 **Revision 23** Page 20 of 21

DATA SHEET 16

Examiner Qualification

Name of Examiner	Employer	Method CENERAL DETAILED VISUAL	Level
W			
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I have reviewed the records relevant to the experience and training of the above named individuals and have, as necessary, trained these individuals in the requirements applicable to the performance of visual examinations of the containment concrete surface. Based on this review and, if applicable, training, I find that these individuals are qualified to perform said ex

qualified to perform said exami	inations.	· /		1/		
Responsible Engineer:	Name	OWARD	//	HILL		
	Registration _	<u> </u>	C222 Licen	65 Ise No.	15 Sep 15 Expiration	
	Signature	HAGA	Inte	Date	06 Nov 13	?
Exelon NDE Services Concurre		James L NI	Jencom (A ENJOINE II) Exern LITE	Date <u>11/7/1</u>	3
ANII Concurrence	<u> </u>	Herry			Date 11/7/3	

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 RTIPICATION FORM QA 2.10.6.1.1.B.
CERTIFICATE OF QUALIFICATION
This is to certify that
W. RANCE ROBBINS SSN _ SSN
has been qualified through on-the-job experience and formal training to meet the requirements of ANSI N45.2.6-1973 and 1978 as:
QUALITY CONTROL INSPECTOR LEVEL The with the following limitations
CERTIFIED FOR ALL ASPECTS OF POST-TENSIONING INSPECTIONS. AND CALIBRATIONS,
This certification will qualify the named individual to perform quality control inspections, exeminations and testing for the various manufact- ured products or services supplied, to meet the requirements of the projects for the Precision Surveillance Corporation and within the limitations of this qualification.
This qualification becomes effective $\frac{2/8/12}{2}$ and shall remain in effect until the recertification date of $\frac{2/8/15}{2}$ or until such time that the named individual leaves the employment of PSC, gives just cause for termination of the certification or requires additional training to maintain a proper Quality Control disposition.
Physical Requirements: Exam Date 1/19/12 to 1/19/13 by OPTOMETRIST
Bram Date <u>5/14/12</u> to <u>5/14/13</u> by <u>RS - ASC</u> Bram Date <u>5/10/13</u> to <u>5/10/14</u> by <u>OPTDUETRIST</u>
Approved by:
Quality Control Inspector Level
Date: 2/8/12

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QUALIFICATION OF QUALITY CONTROL INSPECTORS-PROC. QA 2.10.6.1.1.

CERTIFICATION FORM QA 2.10.6.1.1.B.

CERTIFICATE OF QUALIFICATION

This is to certify that

W. RANCE ROBBINS SSN

has been qualified through on-the-job experience and formal training to meet the requirements of ANSI N45.2.6-1973 and 1978 ss:

QUALITY CONTROL INSPECTOR LEVEL The with the following limitations

CERTIFIED FOR ALL ASPECTS OF POST-TENSIONING INSPECTIONS, AND CALIBRATIONS,

This certification will qualify the named individual to perform quality control inspections, examinations and testing for the various manufactured products or services supplied, to meet the requirements of the projects for the Precision Surveillance Corporation and within the limitations of this qualification.

This qualification becomes effective $\frac{2/8}{12}$ and shall remain in effect until the recertification date of $\frac{2/8}{15}$ or until such time that the named individual leaves the employment of PSC, gives just cause for termination of the certification or requires additional training to maintain a proper Quality Control disposition.

Physical Requirements: Exam Date 1/19/12 to 1/19/13 by OPTEMETRIST Exam Date 5/14/12 to 5/14/13 by AS - ASC Exam Date 5/10/13 to 5/10/14 by OPTEMERIST

Approved by:

Quality Control Inspector Level _____ Date: 2/8/12

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	CERPLENCATE OF QUALIFICAT	CLON
This is to the the		and the second
has been qualified three	BINS cough on the job experience of ANSI N45.2.6-1973 and	e and formal training co
QUALITY CONTROL INSPECT	TOR LEVEL — with the	following limitations
CERTIFIED FOR ALL AS	SPECTS OF POST-TINSIO	NING INSPECTIONS AND CALIBRATIONS.
control inspections, e ured products or servi- projects for the Preci- limitations of this qua		for the various manufact- e requirements of the ation and within the
effect until the recer- such time that the nam just cause for termina	comes effective $2/9/09$ stification date of $2/2$ and individual leaves the ation of the certification a proper Quality Control of	<u>employment of PSC, gives</u> or requires additional
Physical Requirements:		9/9/09 by PSC - Car a Xitt 19/11 by OPTOMETRIST 14/11 by DR BRAD GOOK, DD.
	Church .	14/12 by optimizinist
Approved by:A	wadne	
Quality Control Inspec	<u>.</u>	

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PSC Formerly Inryco Surveillance QUALIFICATION OF QUALITY CONTROL INSPECTORS-PROC. QA 2.10.6.1.1. PERFORMANCE EVALUATION FORM QA 2.10.6.1.1.A. PERFORMANCE EVALUATION FOR QUALITY CONTROL INSPECTORS To be performed at periodic intervals not to exceed three years. This evaluation shall constitute continuation of certification or As A QUALITY CONTROL INSPECTOR LENEL TE This is to certify that the performance of Quality Control Inspector Level 💻 Name W. RANCE ROBBINS Social Security No. haø been evaluated by the undersigned on this date 2/4/13Performance is evaluated as follows: Basel on a record review, he has performed satisfactority and was active in the examination and inspection activities of tensioning systems and components during the first year. **(**) Porformance is satisfactory. Performance is unsatisfactory and requires additional training in the following areas: NIA This individual has been removed from inspection, examination and testing activities effective N/A . Genel Bussone Date: 2/4/13. DA Maragy Stual Bussone Date: 2/4/13 Signed: OA Maragy Title: Bussone Approved: Menager, Quality Assurance This document shall be placed into the certification file for the Inspector being evaluated. 00250

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Inryco	Sorvelila	nce

QUALIFICATION OF QUALITY CONTROL INSPECTORS-PROC. QA 2.10.6.1.1.

PERFORMANCE BVALUATION FORM QA 2.10.6.1.1.A.

PERFORMANCE EVALUATION FOR QUALITY CONTROL INSPECTORE To be performed at periodic intervals not to exceed three years. This avaluation shall constitute continuation of certification or ASA QUALITY CONTROL INSPECTOR LEVEL IT This is to certify that the performance of Quality Control Ingenetor Level Name W. RANCE RUBBINS Social Security No. hag been evaluated by the undersigned on this date _______ Performance is evaluated as follows: on a record review, has Base in the examination and inspection and was active past - tensiming systems and components activities during Prist year Performance is satisfactory. Performance is unsatisfactory and requires additional training in the following areas: NIA This individual has been removed from inspection, examination and testing activities effective _________. Gerald Bussone Date: _ Signed: Title: mosore Date: Approveds Manager, Quality Assurance This document shall be placed into the certification file for the Inspector being evaluated.

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	QUALIFICATION OF QUALITY CONTROL INSPECTORS-PROC. QA 2.10.6.1.1.
F	PERFORMANCE BVALUATION FORM QA 2.10.6.1.1.A.
	PBRFORMANCE BVALUATION FOR QUALITY CONTROL INSPECTORS
	To be performed at periodic intervals not to exceed three years. This evaluation shall constitute continuation of certification or <u>AS A</u> <u>QUALITY</u> CONTROL IN SPECTOR LEVEL II
	This is to certify that the performance of Quality Control Inspector Level II Name W. Rance Robbins Social Security No. And State has been evaluated by the undersigned on this date 2/1/11
	Performance is evaluated as follows:
	Based on a record review, he has performed satisfactorily
	and was active in the examination and inspection
	activities of post tensioning systems and components
	<u>during the past year</u> .
	Performance is unsatinfactory and requires additional training in the
	L following areas:
	This individual has been removed from inspection, examination and testing activities effective <u>NIA</u> .
	signed: Keiald Bussine Data: 2/7/11.
	Title: OA Manager
	Approveds <u>Kunle Busson</u> Dates <u>2/7/11</u> Manager, Quality Assurance
ł	This document shall be placed into the certification file for the Inspector

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	MANCE BVALUATION FORM QA 2.10.6.1.1.A.
	Performance evaluation for quality control inspectors
evelual	performed at periodic intervals not to exceed three years. This tion shall constitute continuation of certification or QVALITY CONTROL INSPECTOR LEVEL IT
Name	to certify that the performance of Quality Control Inspector Level \underline{I} <u>W. RANCE Robertos</u> Social Security No. Control Inspector Level has valuated by the undersigned on this date $\underline{-2/8/10}$
•	ance is evaluated as follows:
Based	on a record review, This performed satisfactarily and was e in the inspection, examination activities of post ioning systems and components during the past year.
actin	in the inspection, examination activities of past
Tins	ioning systems and components during the past year.
X Po	rformance is satisfactory.
[] Pe	rformance is unsatisfactory and requires additional training in the
Land Bo	Llowing areas: NIA
	is individual has been removed from inspection, examination and testing tivities effective
Signed:	Gerald F. Bussone Dates 2/8/10.
-	QN Manager / Yerel III
Title:	
Title: Approved	1: Junit Busine Date: 2/8/10 Hanager, Quality Assurance

BEACAPION OF QUALITY CONTROL INSTRUCTORS PROC. QA 2.10.6.1.1.
PROPORTANCE REALDANT ON YOR QA 2.10.6.1.1.A.
PERFORMANCE EVALUATION FOR QUALITY CONTROL INSPECTORS
to be performed at periodic intervals not to exceed three years. This systemation shall constitute continuation of certification or A.S. A. QUALITI CONTROL INSPECTOR LEVEL II.
This is to cortify that the performance of Quality Control Inspector Level II. Name W. RANCE ROBAINS Social Socurity No. (1997) Inspector Level II. been evaluated by the undersigned on this date _2/97
Performance is evaluated as follows:
Based on a second series has performed satisfactorily and was
Based on a second seriew has performed satisfactorily and was active in the inspection, examination activities of post - tensioning systems and components during the past year.
Performence is satisfactory.
Performance is unsatisfactory and requires additional training in the following areas:
NA
This individual has been removed from inspection, examination and testing activities offectiveN/A
signed: Merall F. Bussone Data: 2/9/09.
Title: <u>Level III</u>
Approved: <u>Lualit-Bussone</u> Date: <u>2/9/09</u>

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AU16 TONI TOU	OF QUALITY CONTROL INSPECTORS-PROC. QA 2.10.6.1.1.	
PBRFORMAN	ICB BVALUATION FORM QA 2.10.6.1.1.A.	
	PBRFORMANCE EVALUATION FOR QUALITY CONTROL INSPECTORS	
evaluatio	formed at periodic intervals not to exceed three years. The shall constitute continuation of certification ofA GNALITY CONTROL INSPECTOR LEVEL TT	his
This is t Name <u>W</u> .	to certify that the performance of Quality Contractor RANCE RO(BIN) Social Security No. (19)05	r Lev
	ice is avaluated as follows:	
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<u>ejean</u>	on a record review has performed satisfacto is active in the wapection examination activ 1- tensioning suptemental components during the	par
	formance is unsatisfactory and requires additional training lowing areas:	in t
 This	individual has been removed from inspection, examination a	and t
acti	vities effective <u>NIA</u> .	
Signed: _	Heald F. Bussone Data: 2/29/08	<u>.</u>
Title:	Hanager, Quality Assurance Data: 1.(29/03	
This docu	ment shall be placed into the certification file for the In eluated.	ua bec

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Topical Report 213 Attachment 3 Page 20 of 154

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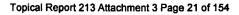
7. 1. PHYSICAL TESTING FORM OA 2.10.6.1.1.1

PSC Formedy large Survillance PHYSICAL TESTING OF INSPECTORS-PROC. QA 2.10.6.1.1.1.
FRYBICAL TESTING FORM QA 2.10.6.1.1.1
VADIA W. RANCE Robbins Data 5-10-13 Recess Data
1. PHYSICAL CHARACTERISTICS Rating <u>Accepts ble</u> Limitations <u>NONE</u> Comments <u>NCAP</u>
2. VISUAL - FAR RANGE Tost Davice SUBILE .
Vision rating & L 20/20 R 20/30 Both 20/20
commonto <u>uncorrected</u>
3. <u>VAEUAL - HEAR PAHOR</u> Sest Device Shellen Vision cating grade L <u>J 20/20</u> RJ <u>20/20</u> Both J <u>20/20</u> Convected
4. COLOR PERCEPTION Test Davice Quick Six (180/atts)
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6 7 8 9 10 11 12 13 14 15
Baoro 14 Parception NOT Ma
Score shall not be less than 10 to be acceptable for perception. Comments $\rhoassed 18 of 18$
5. OVERALL BATING Capability (a cod
Examinar Dr. brog Pierongeli Tiero Optonetry Data 5-10-13

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Namo	e: W.R	ance Robbi	ins	Social Security Number:		Certif	ication Date: 05/17/1	2
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				Lev	el II			
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1	Practical n/a		1/a	n/a	n/a	n/a	n/a	
We	e certify that th	he above n	amed en	nployee meets all	of the qualific	ation requirements	of the PSC Proce	ture
				artification as a	·	-	\overline{A}	
	cale expires a	fter í	05/17/20	15 Anr	roval Signatu	re: Kil	4/	

Topical Report 213 Attachment 3 Page 22 of 154

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PS Norigina Su Pringina Su	C			Cl 4/28/99; Revision	SC PROCEDURE ERTIFICATION O Revision 0, n 2, 7/6/99; Revis , 08/01/08; Revisi	F EXAMINER EXHIBIT F April 26, 1999 Page 1 of 2 Ion 3, 2/24/05;
	L	EVEL II RECORD		NCE		<u> 2017 A. 1937 B. 1977 A. 1977 A</u>
Mr./Ms _	W. Rance Robbins	has worked at	PSC Location	Since	12/2005	to date.
	at time he/she has participated n VT-1 examination required by			visual examin	ations similar to	the Visual
	·····	OPERATING NUC	LEAR STATION	S)	<u></u>	
Visu	ual Examination(s): V.C. S	Summer Nuclear Plan	it, Arkansas Nucle	ar One, Calver	t Cliffs Nuclear I	Plant
Tur	key Point Nuclear Plant, Fort C	alhoun Nuclear Plant	, South Texas Pro	ject, Millstone i	Nuclear Plant	
Poi	nt Beach Nuclear Plant, Palisad	ies Nuclear Plant, La	Salle Nuclear Plar	nt, Braidwood N	luclear Plant	
Rep	air / Replacement:					
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	MANUFACTURI	NG, CONSTRUCTIO	N, FABRICATION	OR INSTALL	ATION	
Vis	ual Examination(s):					
	·····		······································			
Din	nensional Verification:					
[L	<u></u>				<u> </u>]
	The above also mee	ts the following Level	II PSC Procedure	VT1.CERT rea	quirement:	
<u> </u>	_ High School Graduate		Associate Degree	·	_ Four-Year Co	
	1 year		6 months		3 moi	nths
		W. Rance	Robbins		05/15/12	
	Completed by (Candida	ale):			Date	
Į	Social Security Numbe	r:	A A			
	Verified and Accepted		12.62		05/17/12	
1	-	/ Ps	CP.E		Date	

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PRECISION SURVEILLANCE CORPORATION VISUAL EXAMINATION TRAINING

NAME: V	N. Rance Robbi	N\$	DATE: <u>5-1</u>	4-2012
SOCIAL SE	CURITY)	
EXAM: VIS	SUAL GENERAL LEV	VEL II FOR VT-1	A	
GRADE:	95%	GRADED BY:	Jon Eloy,	P.E. 5/15/12

I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter.

I have read and understand the above statements: W 5.14.2012 KANIE Student Signature Date

	Α	В	С	D		A	В	C	D			Α	8	С	D		A	В	С	D
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FILL IN ONE CIRCLE AS THE ANSWER FOR EACH QUESTION

VTIGENERAL EXAM FORM 051412

Topical Report 213 Attachment 3 Page 24 of 154

VT-1 GENERAL EXAM

1. What type of containment is not inspected to IWL?

A. Concrete Containment

B. Steel Containment

2. What is the character height of the lower case letters for VT-1?

A. 0.500"

B. 0.044" C. 0.105"

D 0.040

D. 0.010"

3. Per IWL what tendon anchorages are exempt from VT-1 examination?

A. Inaccessible due to structural obstructions

B. Inaccessible due to radiological hazards

C. Inaccessible due to safety concerns

D. All of the above

4. PSC Procedure for VT-1 Level II certifications comply to?

- A. ACI 301.
- B. IWL 2001 edition with 2003 addenda.
- C. IWE 92.

D. IWL 98.

5. Level II minimum education required for certification is:

- A. No education.
- B. One year of college.

C. High school or equivalent.

D. MBA degree.

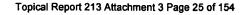
6. VT-1 Level II minimum education required for certification is?

A. High school or equivalent.

B. MBA degree.

C. No education.

D. One year of college.



7. At a two unit site such as Braidwood Station, what reduction in Containment Tendon System anchorage inspection examination frequency is permitted?

A. Can be reduced if the Utility can not afford to expend the money for it

B. None; each unit must have selected tendon anchorages VT-1 examined every 5 years

C. Reduction is permitted only if both containments are post-tensioned

D. Each unit is examined only once every ten years

8. PSC Procedure for Level II certifications comply to:

A. IWE 92. B. IWL 2001 edition with 2003 addenda. C. IWL 98. D. ACI 301.

9. Which subsection of ASME Section XI applies to VT-1 examinations of Containment Post Tensioning Systems?

A, IWL B. IWE C. IWC D. IWB

10. Level II minimum education required for certification is?

- A. High school or equivalent
- B. MBA degree

C. No education

D. One year of college

11. What is an optical comparator?

- A. A device to measure surface lighting intensity
- B. A device to evaluate vision
- C. A device to determine color resolution
- D. None of the above



12. Who may perform VT-1 examinations without VT-1 certification?

A. A manager or supervisor of ISI programs

B. Level II ISI personnel

C. QC Personnel

D. None of the above

13. What amendment to 10 CFR 50 incorporated by reference the requirements of ASME Section XI, 2001 Edition with 2003 Addenda?

A. Appendix A B. 10 CFR 10.30 C. 1992 Addenda D. 10 CFR 50.55a

14. How often is VT-1 Level II re-certification required?

A. Every 5 years.B. Every 3 months.C. Every year.D. Every 3 years.

15. When should the character height of near-distance test charts be measured?

- A. When a Relevant Condition is found
- B. After the inspection
- C. Before use of it
- D. When requested by the Registered Engineer

16. For VT-1 examinations what is the minimum near distance vision acuity the examiner must have?

A. at least 20/25 Snellen in at least one eye.

- B. None
- C. 20/20
- D. 40/40 or better



17. PSC's Procedure for Level II certifications complies to?

A. ACI 301 B. IWE 92 C. IWL 2001 edition with 2003 addenda D. IWL 98

18. For nuclear plants that completed their Structural Integrity Test 20 years ago how often must the Containment Post-Tensioning System VT-1 examination of tendon anchorages be performed on tendons selected for in-service inspection per IWL?

A. Every 6 months B. Every 5 years C. Every 3 years D. Every 2 years

19. Which of the following conditions is typically recorded as a Recordable Condition during a VT-1 examination of tendon anchorages?

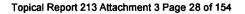
A. Broken wiresB. Missing button headsC. Cracks in anchor headsD. All of the above

20. VT-1 inspection is required to be performed on?

A. Jacks/Rams used for stressing

- B. All of the above
- C. Tendon Anchorages
- D. Exterior Containment concrete surface and grease cans





VT-1 GENERAL EXAM ANSWER KEY

1. B 2. B 3. D 4. B 5. C 6. A 7. B 8. B 9. A 10. A 11. D 12. D 13. D 14. D 15. C 16. A 17. C 18. B 19. D 20. C



PRECISION SURVEILLA VISUAL EXAMINAT	
NAME: W. RANCE Robbins	DATE: <u>5-14-2012</u>
SOCIAL SECURITY NUMBER: EXAM: <u>VISUAL SPECIFIC LEVEL II FOR VT-</u>	
GRADE: <u>95%</u> GRADED BY	x Charle P.E. 5/15/12

I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter.

I have read and understand the above statements: W. Kauce 5-14-2012 **Student Signature** Date

FILL IN ONE CIRCLE AS THE ANSWER FOR EACH QUESTION

D B С D B В С Α А С D С D A Ë Α Ó Ο Ο Ο Ο Ο • Ο Ο • O O Ο EXAM "05/14/12"

VT-1 SPECIFIC EXAM

1. Subsection IWL contains requirements for a Responsible Engineer. He must be an experienced Registered Professional Engineer. What is he responsible for?

A. Submittal of the report to the Owner documenting results of examinations and repairs.

B. Evaluation of examination results.

C. Approval, instruction, and training of concrete examination personnel.

D. Development of plans and procedures for examination of concrete surfaces.

E. All of the above.

2. Per ASME Section XI, subsection IWL what are to be given a VT-1 examination?

A. Containment tendon strand wedges or wire button heads

B. The safety shoes craft personnel are wearing

C. None of the above

D. The condition of hard hats worn by personnel

3. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

A. Grease coverage on the concrete

B. Protruding wires

C. Bushing diameter

D. Thread tolerance

4. A VT-1 examination requires the inspector to be within how many inches of the surface being examined?

A. 3 inches B. 24 inches C. 90 inches D. 60 inches

5. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

A. Dissolved water in the grease

٠.

B. Amount of grease in the grease can

C. Grease can grease level

D. Evidence of free water

6. The tendon bearing plate is to be given what kind of visual inspection?

A. VT-3C B. Cursory C. VT-1C D. VT-1

7. What is the typical PSC procedure used for Anchorage Inspection?

A. SQ 2.0 B. SQ 12.1 C. SQ 8.0 D. SQ 4.0

8. The tendon wire button heads are to be given what kind of visual inspection?

A. General B. VT-1 C. VT-1C D. VT-3C

9. Following the re-tensioning of a tendon that has been de-tensioned a VT-1 inspection is used to detect:

- A. Broken wires or strands.
- B. Amount of nitrates in the grease.
- C. Temperature of the concrete.
- D. If the grease can has been galvanized.

10. Which of the following is not typical equipment used for VT-1 examination?

- A. Pressure gage
- B. Flashlight
- C. Camera
- **D. Optical Comparator**

11. Mirrors and supplemental lighting are aids for?

- A. General visual inspection.
- B. VT-2B inspection.
- C. VT-1 inspection.
- D. VT-3 inspection.



12. Following the re-tensioning a tendon that has been de-tensioned a VT-1 inspection is used to detect:

- A. Amount of sulfides in the grease.
- B. If proper shim gaps have been maintained.
- C. Time re-tensioning was completed.
- D. If tools have been cleaned up from the area.

13. Per PSC Procedures for VT examinations who approves the qualifications of VT Examiners?

- A. Responsible Engineer (P.E.)
- B. VT Supervisor
- C. Project Manager
- D. Project Superintendent

14. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

A. Broken wires B. Concrete finish C. All of the above D. Wire diameter

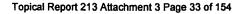
15. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

- A. Type of galvanizing on Grease can
- B. Gasket seal on Grease Can
- C. Cracks in anchorage hardware
- D. None of the above

16. Per ASME Section XI, subsection IWL what are to be given a VT-1 examination?

- A. Temperature of the anchorhead
- B. Containment tendon shims
- C. All of the above
- D. Temperature of the concrete





17. On tendons selected for in-service inspection VT-1 inspection is used to detect:

A. Missing button heads.

B. Protruding wires.

C. Broken wires.

D. All of the above.

18. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

A. Chemistry of shim material

B. Material type of shim material

C. Displacement of shims

D. Diameter of Shims

19. What is VT-1 examination used to detect on Containment Post Tensioning Systems (tendon anchorage) selected for in-service inspection?

A. Shim finish

B. Missing button heads

C. Anchor head finish

D. Bushing hardness

20. Tendon shims are to be given what kind of visual inspection?

A. VT-3C B. Cursory C. VT-1C D. VT-1

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VT-1 SPECIFIC EXAM ANSWER KEY

1. E 2. A 3. B 4. B 5. D 6. D 7. C 8. B 9. A 10. A 11. C 12. B 13. A 14. A 15. C 16. B 17. D 18. C 19. B 20. D

Topical Report 213 Attachment 3 Page 35 of 154

PRECISION SURVEILLA Visual Examinat PRACTICAL EXAMINA	ion Training
NAME: W. RANCE RODDINS	DATE: <u>5-14-2012</u>
SOCIAL SECURITY NUMBER:	
EXAM METHOD VT-I pr VT-IC or VT-3C	EXAM NUMBER: $\# 1$
GRADE: 100% INSTRUCTOR/ GR.	ADED BY:

I have neither given, received or observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter.

5.14.2012

Date

I have read and understand the above statements: W. Gue Colors Student Signature

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS			
10	Select procedure Verify revision	+10			
10	Select form Verify revision	+10			
5	Select equipment Vcrify calibration/resolution	+5			
5	Verify adequacy of lighting Prior to and during inspection	+5			
5	Record part/item number On inspection form	+5			
15	Inspect component/part Identify discontinuities	+15			
15	Compare discontinuities to Recording criteria in procedure	+15			
25	Correctly record discontinuities	+25			
5	Sign and date form	+5			
5	Complete form Accurate and legible	+5			



TURKEY POINT 40 TH YEAR TENDON Image: Unit 3 Image: Unit 3 Project: SURVEILLANCE Image: Unit 3 Image: Unit 3 (7.3)Tendon No.: $V - 03$ Tendon End: $Galkry$ Image: Shop Image: Field	4
ANCHORAGE INSPECTION CRITERIA	Q.C. Signoff
9.0 & 10.0 - CORROSION & CRACK INSPECTION	Q.C. Signoli
(9.2) Buttonheads Level: $A^{(1)}$ (10.1) Cracks Yes $^{(2)}$ M No N/A (9.2) Anchorhead Level: $2^{(1)}$ (10.1) Cracks Yes $^{(2)}$ M No N/A (9.2) Shims Level: $2^{(1)}$ (10.1) Cracks Yes $^{(2)}$ M No N/A (9.2) Shims Level: $1^{(1)}$ (10.1) Cracks Yes $^{(2)}$ M No N/A (9.2) Bearing Plate Level: $2^{(1)}$ (10.1) Cracks Yes $^{(2)}$ M No N/A (9.2) Bearing Plate Level: $2^{(1)}$ (10.1) Cracks Yes $^{(1)}$ M No N/A (9.2) Bearing Plate Level: $2^{(1)}$ (10.1) Cracks Yes $^{(1)}$ M No N/A (9.2) Bearing Plate Level: $2^{(1)}$ (10.1) Cracks Yes $^{(1)}$ M No N/A (9.2) Bearing Plate Level: $2^{(1)}$ (10.1) Cracks Yes $^{(1)}$ M No N/A (9.2) Corrosion Levels of 3, 4 or 5, or E require an NCR. M Compose a sketch of the cracks on Sketch Sheet 8.0 and initiate an NCR.	<u>WPP 5-15-12</u> A
11.0 - BUTTONHEAD INSPECTION Offsize (Malformed) Protruding/unseated wire/buttonheads	
Ø Broken/missing wire/buttonheads Previously Identified as missing Ø Discontinuous - removed	
Wire(s) removed during this surveillance for testing Double 0	
(11.2) Anchorhead I.D. NONC Located on Sketch A Yes No (11.4) Missing Buttonheads Found: N Yes No Quantity: A Additional leformation:	
Shim stack bt. 5"	
1 3/4, 13/4, 1/2, 1/4, 1/K, 1/4	WRR51512
(12.2) Number of Protruding Buttonheads (-): (8.3) Light Meter ID: (M.90/ Cal Due: 9-19-P (12.3) Number of Missing Buttonheads (0, 2): 0 (12.4) Total of Protruding + Missing Buttonheads: 1 (12.4) Total of Protruding + Missing Buttonheads: 1	
(12.5) Total # of Effective Buttonheads Seated: <u>59</u> Wires Identified? ^M A Yes No (12.7) Overall Results X Acceptable Un-Acceptable Customer Notified NCR#: <u>NA</u>	WRRS-IS-D
QC Reviewed: Date:	1
19	SQ 8.0.TP.11 ISI

Topical Report 213 Attachment 3 Page 37 of 154

PRECISION SURVEILLANCE CORPORATION Visual Examination Training PRACTICAL EXAMINATION CHECKLIST						
NAME: W. RANCE Robbins	DATE: <u>5-14-2012</u>					
SOCIAL SECURITY NUMBER:						
EXAM METHOD: VT-1 or VT-1C or VT-3C EX	(AM NUMPER: $\int \frac{\# 2}{2}$					
GRADE: 100% INSTRUCTOR/ GRADE	BY: ASTE Stuff					

I have neither given, received or observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter.

5-14-2012

Date

I have read and understand the above statements: <u>W. Fance</u> <u>Web</u> Student Signature

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS
10	Select procedure Verify revision	<i>t10</i>
10	Select form Verify revision	+10
5	Sclect equipment Verify calibration/resolution	+5
S	Verify adequacy of lighting Prior to and during inspection	+10 +5 +5
5	Record part/item number On inspection form	+5
15	Inspect component/part Identify discontinuities	+15
15	Compare discontinuities to Recording criteria in procedure	+15
25	Correctly record discontinuities	+25
5	Sign and date form	+.5
5	Complete form Accurate and legible	+5



Vtpsctest.practical

TURKEY POINT 40 TH YEAR TENDON XUNIT 3 UNIT Project: SURVEILLANCE HRP 5-5-12- 7.3)Tendon No.: Y-03 Tendon End: G Dome Shop Field	4
ANCHORAGE INSPECTION CRITERIA	
As-Found Post De-Tensioning / Pre-Wire Removal Post Re-Tensioning	Q.C. Signoff
Refer to SQ 10.1 - DETENSIONED ANCHORAGE INSPECTION (8.3.1) Wire Coating: Corrosion Level: N/A (1)- Corrosion Lavels of 3.4 or 5, or E require an NCR. (1)- BUTTONHEAD INSPECTION Offsize (Mailformed) Protructing/unseated Wire/buttonheads Ø Broken/missing wire/buttonheads Prevlausly identified as missing Ø Discontinuous - removed Wire(s) removed during this Uncated on Sketch: M/A Yes INO (11.2) Anchorhead I.D. Nowle (11.4) Missing Buttonheads Found: N/A	WRR 5.15.12 N/A
Shim stack ht 41/2" -111, 1/2, 1/8, 1/8, 1	WRR5-15-12
(12.2) Number of Protruding Buttonheads (•): 0 (8.3) Light Meter ID: (MQ0) Cal Due: 9-19-P (12.3) Number of Missing Buttonheads (Ø, Ø): 1 (12.4) Total of Protruding + Missing Buttonheads: 1 (12.6) Continuity Test Requested ? Yes Ø No (12.5) Total # of Effective Buttonheads Seated: 99 Wires Identified? Yes Ø No (12.7) Overall Results Ø Acceptable Un-Acceptable Customer Notified NCR#: N/A	wR2515-12
QC Reviewed: Date: Date:	.
	5Q 8.0.TP.11 ISI

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PSC PSC PSC Participant Sometime Comparentes	ر ه		VEL II CERTIFI	Revision 4,	CE n 1, 4/28/99; Revision 08/31/07; Revision 5,	2, 7/6/99; Revis	DF EXAMINER EXHIBIT A April 26, 1999 Page 1 of 1 sion 3, 2/24/05;
Name:	W. Ranc	e Robbins	Social Security Number:		Certifi		17/12
Visual Method:		IC/3C	Ce	ertification Level:	<u> </u>	1	
			Lev				
	Ge	eneral	90%	Date	05/15/12		
	Sp	ecific	95%	Date	05/15/12	-	
	Pra	·	VT-1C: 98%	Date	05/16/12	-	
			VT-1C: 98%		05/16/12	-	
]			/T-3C: 96% /T-3C: 100%		05/16/12	-	
			ctical Ave: 98%			-	
	Con	nposite	94.33%	Date	05/17/12	-	
	<u> </u>		te grade shall be an able examination g	grades for eac	h category.		
l r	Туре	Given By	Training Cours	Ses Complete Hours	Date	Instructor	
-	General	n/a	n/a	n/a	n/a	n/a	
	Specific	n/a		n/a	n/a	n/a	
	Practical	n/a		n/a	n/a	n/a	
1	-		employee meets all on/recertification a		cation requirements /T-1C/3C Examinent		ocedure 7
This certifica	ite expires after	05/17/1	5 Ap;	proval Signatu	re: Mate	KG	2

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Revision 1, 4/2009; Revision 2, 7/409; Revision 3, 224 Revision 4, 08/3107; Revision 5, 06/01/08; Revision 6, 09/07 LEVEL II RECORD OF EXPERIENCE /Ms	XX				Revision 0, April 2	6, 199
Revision 4, 0881/07; Revision 5, 08/01/08; Revision 6, 08/0 LEVEL II RECORD OF EXPERIENCE /Ms	Artifica Sama		Revision 1, 4/28/	99; Revision 2, 7		
Ms W. Rance Robbins has worked at	трице	•				
Intermediate	l	LEVEL II RECORD O	FEXPERIENCE		i The administration of the state of the sta	
ing that time he/she has participated in the following activities which involve visual examinations similar to the Visual examinations (VIT-1C) OR GENERAL (VT-3C) examination required by ASME, Section XI, Subsection IWL. OPERATING NUCLEAR STATION(S) Visual Examination(s): V.C. Summer Nuclear Plant, Arkansas Nuclear One, Calvert Cliffs Nuclear Plant Turkey Point Nuclear Plant, Fort Calhoun Nuclear Plant, Crystal River Nuclear Plant, Millstone Nuclear Plant Point Beach Nuclear Plant, Palisades Nuclear Plant, LaSalle Nuclear Plant, Braidwood Nuclear Plant Repair / Replacement: Modification(s): Periodic test(s): Dimensional Verification: Dimensional Verification: Visual Examination (s): Method Graduate The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X	/MsW. Rance Robbins	has worked at	PSC	Since	12/2005 to	date
Pection DIRECT (VT-1C) OR GENERAL (VT-3C) examination required by ASME, Section XI, Subsection IWL. OPERATING NUCLEAR STATION(S) Visual Examination(s): V.C. Summer Nuclear Plant, Arkansas Nuclear One, Calvert Cliffs Nuclear Plant Turkey Point Nuclear Plant, Fort Calhoun Nuclear Plant, Crystal River Nuclear Plant, Millstone Nuclear Plant Point Beach Nuclear Plant, Pallsades Nuclear Plant, LaSalle Nuclear Plant, Braidwood Nuclear Plant Repair / Replacement: Modification(s): Periodic test(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X			Location			
Visual Examination(s): V.C. Summer Nuclear Plant, Arkansas Nuclear One, Calvert Cliffs Nuclear Plant Turkey Point Nuclear Plant, Fort Calhoun Nuclear Plant, Crystal River Nuclear Plant, Millstone Nuclear Plant Point Beach Nuclear Plant, Palisades Nuclear Plant, LaSalle Nuclear Plant, Braidwood Nuclear Plant Repair / Replacement: Modification(s): Periodic test(s): Modufication(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X						sual
Turkey Point Nuclear Plant, Fort Calhoun Nuclear Plant, Crystal River Nuclear Plant, Millstone Nuclear Plant Point Beach Nuclear Plant, Palisades Nuclear Plant, LaSalle Nuclear Plant, Braidwood Nuclear Plant Repair / Replacement: Modification(s): Periodic test(s): MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X		OPERATING NUCLE	AR STATION(S)			7
Point Beach Nuclear Plant, Palisades Nuclear Plant, LaSalle Nuclear Plant, Braidwood Nuclear Plant Repair / Replacement: Modification(s): Periodic test(s): Periodic test(s): MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months Completed by (Candidate): W. Rance Robbins 05/15/12 Date Date 05/17/12	Visual Examination(s): V.C.	Summer Nuclear Plant, A	Arkansas Nuclear O	ne, Calvert Cliff	s Nuclear Plant	
Repair / Replacement: Modification(s): Periodic test(s): Periodic test(s): MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree Four-Year College Degree 1 year 6 months 3 months Completed by (Candidate): W. Rance Robbins 05/15/12 Date 05/17/12 05/17/12	Turkey Point Nuclear Plant, Fort	Calhoun Nuclear Plant, C	rystal River Nuclear	Plant, Millstone	Nuclear Plant	
Modification(s): Periodic test(s): MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months 3 months Completed by (Candidate): M430-31/9556 Date Social Security Number: M430-31/9556 Date	Point Beach Nuclear Plant, Palisa	ades Nuclear Plant, LaSa	le Nuclear Plant, Bi	aidwood Nucle	ar Plant	
Periodic test(s):	Repair / Replacement:					
Periodic test(s):						
Periodic test(s):						
MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X	Modification(s):					
MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months 95/15/12 Completed by (Candidate): W. Rance Robbins 05/15/12 Social Security Number: M430-31/9556 Date						
MANUFACTURING, CONSTRUCTION, FABRICATION OR INSTALLATION Visual Examination(s): Dimensional Verification: Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: X	Periodic test(s):					
Visual Examination(s): Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months Completed by (Candidate): W. Rance Robbins 05/15/12 Date Social Security Number: 05/15/12 05/17/12 05/17/12						
Visual Examination(s): Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months Completed by (Candidate): W. Rance Robbins 05/15/12 Date Social Security Number: 05/15/12 05/17/12 05/17/12						
Dimensional Verification: The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School Graduate Two-Year Associate Degree 1 year 6 months 3 months Completed by (Candidate): W. Rance Robbins 05/15/12 Social Security Number:	MANUFACTUR	ING, CONSTRUCTION,	FABRICATION OR	INSTALLATIO	N	
The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: XHigh School GraduateTwo-Year Associate DegreeFour-Year College Degree 1 year 6 months 3 months 3 months 3 months 05/15/12 6 completed by (Candidate):W.Rance Robbins05/15/12 Date05/17/12	Visual Examination(s):	- 18 Manual				-1
The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: _XHigh School GraduateTwo-Year Associate DegreeFour-Year College Degree 1 year 6 months 3 months 3 months 3 months 05/15/12 Completed by (Candidate):W. Rance Robbins05/15/12 Social Security Number:						
The above also meets the following Level II PSC Procedure VT1C/3C.CERT requirement: _XHigh School GraduateTwo-Year Associate DegreeFour-Year College Degree 1 year 6 months 3 months 3 months 3 months 05/15/12 Completed by (Candidate):W. Rance Robbins05/15/12 Social Security Number:						
	Dimensional Verification:					
_XHigh School Graduate Two-Year Associate Degree Four-Year College Degree 1 year 6 months 3 months Completed by (Candidate):		······				
	The above also meets	s the following Level II PS	C Procedure VT1C/	3C.CERT requi	rement:	
1 year 6 months 3 months Completed by (Candidate): W. Rance Robbins 05/15/12 Social Security Number: 1430-3148556 Date		-		•		D
Social Security Number:				ro		Degr
Social Security Number:	·					
Social Security Number:430-374556	Completed by (Candid	date):W. Rance	Robbins	+17117-	05/15/12	_
05(17/12	Social Socurity Numb	ar:/430-31	49556		Date	
Verified and Accepted by:	-		r/1		05/17/12	
PSC P.E. Date	Verified and Accepted	by: _ Chiller				

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PRECISION SURVEILLANCE CORPORATION VISUAL EXAMINATION TRAINING

NAME: William Rance R	bhins	DATE: 5-14-2012
SOCIAL SECURITY NUMBER:		
EXAM: <u>VISUAL GENERAL LEV</u>	EL II FOR VT-1C/3C	Λ
grade: <u>9075</u>	GRADED BY:	Eliz P.E. stishiz

I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter.

5-14-2012 I have read and understand the above statements: Student Signature Date

FILL IN ONE CIRCLE AS THE ANSWER FOR EACH QUESTION

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V FIC3CGENERAL EXAM FORM 051412

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VT-C GENERAL EXAM

1. What is the function of the ANII?

A. To verify compliance with NRC regulations

B. To provide another approval signature on forms

C. To ensure nuclear safety

D. To verify compliance with applicable requirements of the ASME Code

2. What is the character height of the lower case letters for VT-1C?

A. 0.010" B. 0.105" C. 0.044" D. 0.500"

3. PSC's Procedure for Level II certifications complies to?

A. ACI 301 B. IWL 2001 edition with 2003 addenda C. IWL 98 D. IWE 92

4. What are some examples of aids used for "remote" VT-3C visual examinations?

A. None of the aboveB. Binoculars, telescopes or transitsC. Mirrors

D. Feeler gauges

5. What is an optical comparator?

A. A device to determine color resolution

B. A device to evaluate vision

C. A device to measure surface lighting intensity

D. None of the above



6. What is the effective date of the amendment to 10 CFR 50 that incorporated by reference the requirements of ASME Section XI, 1992 Edition with 1992 Addenda?

A. 9-9-96 B. 9-9-97 C. 9-9-96 D. 9-9-01 E. 9-9-00

7. Who may perform VT-1C examinations without VT-1C certification?

- A. QC Personnel
- B. Level II ISI personnel
- C. A manager or supervisor of ISI programs

D. None of the above

- 8. What type of containment is Quad City?
- A. Steel Containment
- B. Concrete Containment

9. When should the character height of near-distance test charts be measured?

- A. After the inspection
- B. When requested by the Registered Engineer
- C. When a Relevant Condition is found
- D. Before use of it

10. Which code specifies the general requirement for certification?

A. IWA B. IWL C. IWE D. IWB

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11. What amendment to 10 CFR 50 incorporated by reference the requirements of ASME Section XI, 1992 Edition with 1992 Addenda?

A. 1992 Addenda B. 10 CFR 50.55a. C. Appendix A D. 10 CFR 10.30

12. Which subsection of ASME Section XI applies to VT-1C/3C examinations of concrete containments?

A. IWE B. IWA

C. IWL

D. AWL

13. Section XI, IWL exempts what areas of concrete surfaces of containments to be examined:

A. Areas covered by the steel liner, foundation material or backfill, or are otherwise obstructed by adjacent structures, components parts, or appurtenances.

B. Areas as determined by the ANII

C. Areas requiring the use of a ladder, chair or other equipment to reach them.

D. Areas as determined by the Responsible Engineer

14. For VT-3C examinations what is the minimum far-distance vision acuity the examiner must have?

A. 40/40 or better B. None

D. NONE

C. at least 20/25 Snellen in at least one eye.

D. 20/20

15. VT-3C visual examination is required to be performed on?

A. All of the above

B. Tendon buttonheads

C. Jacks/Rams used for stressing

D. Exterior Containment concrete surface and grease cans



Topical Report 213 Attachment 3 Page 45 of 154

16. Mirrors and supplemental lighting are aids for?

A. General visual inspection

B. VT-3 inspection

C. VT-1C inspection

D. VT-2B inspection

17. What are the methods of visual inspection PSC certifies it's examiners to?

A. VT-1 B. VT-1C C. VT-3C D. All of the above

18. How often is Level II re-certification required?

A. Every 5 years B. Every 3 years C. Every 3 months D. Every year

19. For VT-1C examinations what is the minimum near distance vision acuity the examiner must have?

A. at least 20/25 Snellen in at least one eye.

- B. 40/40 or better
- C. 20/20

D. None

20. Level II minimum education required for certification is?

- A. MBA degree
- B. High school or equivalent
- C. No education
- D. One year of college

VT-C GENERAL EXAM ANSWER KEY

1. D 2. C 3. B 4. B 5. D 6. C 7. D 8. A 9. D 10. B 11. B 12. C 13. A 14. C 15. D 16. C 17. D 18. B 19. A 20. B



PRECISION SURVEILLANCE CORPORATION VISUAL EXAMINATION TRAINING

NAME: William RANCE RO	bins	DATE: 5-14-2012
SOCIAL SECURITY NUMBER: _		
EXAM: VISUAL SPECIFIC LEVE	L II FOR VT-I	Λ
grade: <u>157</u>	GRADED BY: Kata	E. Cr, A.E. 5/15/12

I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration.

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I have read and understand the above statements:

5-14-201 **Student Signature** Date

B C D A B C D A B C D A B C

FILL IN ONE CIRCLE AS THE ANSWER FOR EACH QUESTION

A D О • • O • • Ο • Ο Ο Ω О Ο • • O O O O О EXAM "05/14/12"



Topical Report 213 Attachment 3 Page 48 of 154

VT-C SPECIFIC EXAM

1. Per PSC Procedures for VT examinations who approves the qualifications of VT Examiners?

- A. VT Supervisor
- B. Responsible Engineer (P.E.)
- C. Project Manager
- D. Project Superintendent

2. What degradation is defined by the breaking away of small portions of a concrete surface due to localized internal pressure which leaves a shallow, typically conical depression?

- A. Exudation.
- B. Laitance.
- C. Popout.
- D. Encrustation.
- E. Stratification.

3. Visual concrete exams are performed under the direction of what qualified individual?

- A. Corporate Vice President
- **B. Responsible Engineer**
- C. Job Superintendent
- D. Project Manager

4. VT-3C inspection is required to be performed on:

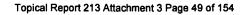
A. Exterior Containment concrete surface and grease caps.

- B. All of the above.
- C. Tendon button heads.
- D. Jacks/Rams used for stressing.

5. Per ASME Section XI, subsection IWL what are to be given a VT-3C examination?

- A. Tendon anchor head
- B. Roof of turbine building
- C. Containment tendon bearing plates
- D. Containment concrete walls





6. Efflorescence is a sign of:

- A. Mineral leaching.
- B. Surface coating.
- C. Nothing.
- D. Concrete additives.
- 7. Efflorescence is a sign of
- A. Mineral leaching
- **B.** Concrete additives
- C. Nothing
- D. Surface coating

8. Per ASME Section XI, subsection IWL what are to be given a VT-3C examination?

- A. The safety shoes craft personnel are wearing
- B. The tendon gallery ceiling
- C. Containment tendon strand wedges or wire button heads
- D. The condition of hard hats worn by personnel

9. When is a VT-1C examination performed?

A. At night

- B. On a sunny day
- C. When the examiner feels like doing something different
- D. suspect areas are detected by VT-3C examination.

10. A VT-1C concrete examination requires what minimum illumination?

A. 100fc B. 300fc C. 200fc D. 50fc



May 14, 2012

11. Detailed VT-1C inspection can apply to:

- A. Tendon force level.
- B. Proper torque applied to bolts.
- C. Concrete cracks.
- D. Back filled section of containment.

12. In tendon anchorage areas, acceptable cracks in the concrete adjacent to the bearing plates do not exceed.

A. 0.010 inch in width. B. 0.100 inch in width.

C. 0.001 inch in width.

D. 1.000 inch in width.

13. When may devices for remote VT-1C examination be used?

A. Health physics considerations make direct VT-1C examination inaccessible

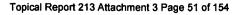
- **B. NRC allows remote**
- C. Health physics allows remote
- D. When it is raining

14. A detailed VT-1C concrete inspection requires what maximum examination distance?

A. 7 feet B. 2 feet C. 35 feet D. 4 feet

15. How often is a vision test required for VT Examiners?

A. Every other month B. Every 5 years C. Every 12 months D. Every 10 years



May 14, 2012

16. What kinds of concrete deterioration and distress are defined in ACI 201.1R-68 & 92?

- A. Concrete cracking.
- B. Concrete deterioration.
- C. Concrete spalling.
- D. All of the above.

17. At a Nuclear Unit how may dirt, contamination or other debris that could interfere with the concrete examination be removed?

A. Mechanical cleaning methods or approved solvents if approved by the Responsible Engineer

B. Acid if approved by the ANII

- C. Fire hose
- D. All of the above

18. What type of degradation often initiates as microscopic cracking at the reinforcing steel-to-concrete bond interface, resulting from periodic applications of load or stress?

- A. Abrasion/erosion. B. Cement-aggregate reactions. C. Fatigue.
- D. Irradiation.

19. Which of the following degradation mechanisms to rebar is associated with changes in the permeability of concrete, presence of an electrolyte, or microbiological attack?

- A. Irradiation.
- B. Fatigue.
- C. Corrosion.
- D. Thermal effects.

20. VT-3C visual examination is required to be performed on?

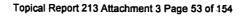
- A. Jacks/Rams used for stressing
- B. Exterior Containment concrete surface and grease cans
- C. Tendon buttonheads
- D. All of the above



May 14, 2012

VT-C SPECIFIC EXAM ANSWER KEY

1. B 2. C 3. B 4. A 5. D 6. A 7. A 8. B 9. D 10. D 11. C 12. A 13. A 14. B 15. C 16. D 17. A 18. C 19. C 20. B



PRECISION SURVEILLAN Visual Examination PRACTICAL EXAMINA	on Training
NAME: RANCE Robbins	DATE: <u>5-14-2012</u>
SOCIAL SECURITY NUMBER:	
EXAM METHOD: VT-1 or VT-1C pr VT-3C	EXAM NUMBER: # /
GRADE: <u>987</u> INSTRUCTOR/ GRA	DED BY Mily L. C. P.E. 5/16/12 PSC P.E

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W. Pouce Pollo	5-14-2012
Student Signature	Date

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS
10	Select procedure Verify revision	+10
10	Select form Verify revision	+10
5	Select equipment Verify calibration/resolution	+5
5	Verify adequacy of lighting Prior to and during inspection	+5
5	Record part/item number On inspection form	+5
15	Inspect component/part Identify discontinuities	+15
15	Compare discontinuities to Recording criteria in procedure	+ /5
25	Correctly record discontinuities	+25 +5
5	Sign and date form	+5
5	Complete form Accurate and logible	+3



PRECISION SURVENTLANCE	BEARING PI	ROCEDURE SQ 8.3 LATE INSPECTION ATA SHEET SQ 8.3 January 10, 2012 Page 1 of 1 Revision 0
Project: TURKEY POINT 40 th YEAR TENDON SURVEILLANCE		
Tendon No.: <u>V-03</u> Tendon End: <u>Top (East)</u> 7.4) Bearing Plate Identification #: <u>Unable to locate</u>	🔀 Shop	🗋 Field
 Orient the bearing plate with the sketch below. Locate the bearing plate identification and document the location on the sketch. Sketch all cracks, including other defects, existing on the concrete in the area surrour 24 inches from the edge of the bearing plate. For cracks equal to or wider than 0.010 inches, document condition on a Nonconform QA 9.0, NONCONFORMANCES, for Florida Power & Light approval. 	-	
$-2: Legibility$ $Crack - 3$ $7''L \cdot X$ $= 3han .010''W$ $Crack - 3$ $7''L \cdot X$ $= 3han .010'W$ $On Hoop and dome this edge is up.$ $Crack II''L X < .010''W$ $Vertical Tendon, this is toward the center of the containment.$	10"L.X030"W, Crack JO"L.X <	Han.010"W. = spall 4"W. x 5.5"L. x 1" Dap.
crack 13"LXC -than .010"W. G exposed form surface	- 74 3- 3- 3- 3- 3- 3- 3- 3- 3- 3- 3- 3- 3-	h w/cowcrete
24" Stale (Al. due: 11-15-12 / Feeler Gauge F-70 Gal. due: 11-14-17 Light Conditions 50fc or greater: 2 Yes No Auxillary Light Source used: 1	- laptical Compara	brace al della
		 3.4.
(7.5) Cracks $\ge 0.010^{\circ}$ (7.5) Cracks ≥ 0.01	Igih: <u>/6</u> NCF	(#: <u>001</u>
		5-14-2012

PRECISION SORVEILLA Visual Examinal PRACTICAL EXAMINA	tion Training
NAME: W. RANCE Robbins	DATE: 5-14-2012
SOCIAL SECURITY NUMBER:	
EXAM METHOD: VT-1 or VT-1C pr VT-3C	EXAM NUMBER:
GRADE: 97, INSTRUCTOR/GR	ADED BY: A PSC P.E. 5/14/2

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W. Ance Vé Student Signature 5.14.2012

Date

I have read and understand the above statements:

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS
		POINTS ORANTED/COMMENTS
10	Select procedure	+ //>
	Verify revision	+/0
10	Select form	
	Verify revision	+/0
5	Select equipment	
	Verify calibration/resolution	45
5	Verify adequacy of lighting	
	Prior to and during inspection	+5
5	Record part/item number	
	On inspection form	+5
15	Inspect component/part	
	Identify discontinuities	+15
15	Compare discontinuities to	
	Recording criteria in procedure	+/5
25	Correctly record	
	discontinuitics	+ 25
5	Sign and date form	+5-
5	Complete form	. 7
	Accurate and legible	+3



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Topical Report 213 Attachment 3 Page 56 of 154

PRECISION SURVEILLANCE	BEARING P	ROCEDURE SQ 8.3 LATE INSPECTION ATA SHEET SQ 8.3 January 10, 2012 Page 1 of 1 Revision 0
Fendon No.: V.03 Tendon End: Gallery (west)) 🔲 Shop	K Field
7.4) Bearing Plate Identification #: UNAble to locate		
 Orient the bearing plate with the sketch below. Locate the bearing plate identification and document the location on the sketch. Sketch all cracks, including other defects, existing on the concrete in the area surrou. 24 Inches from the edge of the bearing plate. For cracks equal to or wider than 0.010 inches, document condition on a Nonconfor QA 9.0, NONCONFORMANCES, for Florida Power & Light approval. 		
-2 i Legi bility Crack 150 "W. Crack 10.5" LX - K Crack 10.5"	A crack 4,5"L.	x .060"N.
Crack 7"2.x 0n Hoop and dome this edge is up. Vertical Tendon, this is toward the center of the containment.	enck li	2″∠x , 155 W.
Spall Area 4" Wide x 13" Long x 1.2"Dock Gerack 12"Lx <thay 010"w,<br=""><thay 010"w,<br=""><th< td=""><td>Erack 8"E. K 1"L. x 1. DIO"W.</td><td>,060 °wide.</td></th<></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay></thay>	Erack 8"E. K 1"L. x 1. DIO"W.	,060 °wide.
24"Seale: R/16 Cal. due: 11-15-12/fector Gruge F 70 Cal. due: 11-14-12/Optical Completion Light Conditions 50fc or greater: X Yes No Auxillary Light Source used:		
$(7.3) \text{ Light Meter ID: } \underline{LMQOI} Date due calibration: } \underline{q-/q-20/2}$ $(7.5) \text{ Cracks } \geq 0.010^{\circ} \text{ 2 Yes } \text{ No } \text{ Quantity: } \underline{R} \text{ Max. Width: } \underline{.(55)^{\circ} \text{ Max.Let}}$	ngih: <u>13 "</u> NCf	≈#:_002
	Date:	5.14.12
QC inspector: W. Ciner Cabler Level: I		7-14 1-

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PRECISION SURVEILLANCE C Visual Examination Tra PRACTICAL EXAMINATION	aining
NAME: W. RANCE Robbins	DATE: <u>5 · 14 - 20 12</u>
SOCIAL SECURITY NUMBER:	
EXAM METHOD: VT-1 or VT-1C or VT-3C EXA	
GRADE: <u>%</u> INSTRUCTOR/ GRADED	BY: hut Ele A.E. Ships

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5-14-2012

Date

I have read and understand the above statements: W, Buce Vo Student Signature

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS
10	Select procedure Verify revision	+10
10	Select form Verify revision	+10
5	Sclect equipment Verify calibration/resolution	+5
5	Vcrify adequacy of lighting Prior to and during inspection	+5
5	Record part/item number On inspection form	+5
15	Inspect component/part Identify discontinuities	+ 15
15	Compare discontinuities to Recording criteria in procedure	+ 15 + 15
25	Correctly record discontinuitics	+21
5	Sign and date form	+5
5	Complete form Accurate and legible	+5



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N1076 PSC PROCEDURE SQ 8.4 CONCRETE EXTERIOR DATA SHEET SQ 8.4 January 10, 2012 Page 1 of 1 Revision 0



VISUAL EXAMINATIO	N - GENERAL VISUAL EXAMINATIO	N			
Project Turkey Point Surveillance	# 10/40 1 Year 40th				
Inspection Area: TOO1					
Equipment Used LA 901 Cal. Ane - 9-19-12-/34 Light Meter	ale Bilb Cal. due 11.18-12/				
Light Meler					
	crete Surface Condition				
Containment Surface (Findings and Description)		N		10	RI
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(10) findings for the particular Recordable Indication Leaching or Chemical Attack Abrasion or Erosion Degradation Popouts and Voids Cracks Scaling Spalls Corrosion Staining on the Concrete Surface Exposed Reinforcing Steel Surface Patches or Repairs	Aurpose of documentation and orientation.) Its to be Examined For (PSC Procedure 8.4) Deterioration of any Concrete Coating (if applic Tendon Grease on Exposed Concrete Surfaces Corrosion on Grease Cans, Bearing Plates or An *Excessive Corrosion on Exposed Embedded *Detached Embedments or Loose Bolting *Indication of Degradation Due to Vibration (* The owner/agent must be notified for these	able) nchorage Metal Su e noted o	: arfac: cond	es	
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PRECISION	URVEICLANCE		COI	ROCEDURE SQ 8.4 NCRETE EXTERIOR SKETCH SHEET 8.4 January 10, 2012 Page 1 of 1 Revision 0
Project:	TURKEY POINT NUCLEAR STATION 40 ^{1H} YE	AR TENDON SURVEILL	ANCE	
Inspection Area:	T001		<u></u>	
1. Sketch or	atlach photographs to provide documentation or	additional details as nec	essary.	
Comments: Area	Area w/ 6 Small popouts Largest: 1.25"Jin. deepest: .25" 5,5' 5,5' 5,5' 5,5' 5,5'	Arca W S mall A bradious Laugest 6" Widest 1.25" Jacpest ,25"	5.5	C C C C C C C C C C C C C C C C C C C
	N. Panca Polici	Level:	Date:	5.14.12
				21 SQ 8.4.TP. 11 ISI

Topical Report 213 Attachment 3 Page 60 of 154

PRECISION SURVEILLAN Visual Examinatio PRACTICAL EXAMINA	on Training
NAME: W. RANCE Robbins	DATE: 5-14-2012
SOCIAL SECURITY NUMBER:	
EXAM METHOD: VT-1 or VT-1C or VT-3C	EXAM NUMBER: #2
GRADE: 107 INSTRUCTOR/ GRA	DED BY: A Ship E. Ship 2 PSC P.E

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I have read and understand the above statements:

W Vince 5.14.2012 _ _ **Student Signature** Datc

POINT VALUE	INSPECTION POINTS	POINTS GRANTED/COMMENTS
10	Sclect procedure Verify revision	+10
10	Sclect form Vcrify revision	+10 +10
5	Select cquipment Verify calibration/resolution	.5
5	Verify adequacy of lighting Prior to and during inspection	+5
5	Record part/item number On inspection form	+5
15	Inspect component/part Identify discontinuities	+15
15	Compare discontinuities to Recording criteria in procedure	+15
25	Correctly record discontinuities	+25
5	Sign and date form	+5
5	Complete form Accurate and logible	+5



Vipsciest.practical

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PRECISION	SURVEILLANCE	N1076 PSC PROCEDURE SQ 8.4 CONCRETE EXTERIOR SKETCH SHEET 8.4 January 10, 2012 Page 1 of 1 Revision 0
Project:	TURKEY POINT NUCLEAR STAT	ON 40 TH YEAR TENDON SURVEILLANCE
Inspection Area:	T002	
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QC Inspector:	W. Rance Pollin	Level: Date:5-14-2012
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Topical Report 213 Attachment 3 Page 63 of 154

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QUALIFICATION OF QUALITY CONTRO	L INSPECTORS-PROCEDU	RE QA 2.10.6.1.1	
CERTIFICATION FORM QA 2.10.6.1.1 B			
CER	FIFICATE OF QUALIF	ICATION	
This is to certify that:			
Clinton West	SSN		
has been qualified through on-the	e-job experience and form	al training to mee	t the requirements of
ANSI N45.26-1973 and 1978 as:			
QUALITY CONTROL INSPEC	TOR <u>LEVEL II</u>	with the followi	ng limitations.
Inspections and Calibrations asso	ciated with Post-Tensioni	ng Systems and (Components.
examinations and testing for the Requirements of the projects for of this qualification. This qualification becomes effect Recertification date of <u>8/21/16</u> of of PSC, gives just cause for term maintain a proper Quality Contro	the Precision Surveillance tive <u>8/21/13</u> and shall rem or until such time that the r ination of the certification	Corporation and ain in effect until named individual	within the limitations the leaves the employment
PHYSICAL REQUIRMENTS:	Eye Exam Date 6/17/13	to <u>6/17/14</u>	by <u>Optometrist</u>
1	Eye Exam Date	to	by
	Eye Exam Date	to	
APPROVED BY: <u>HBus</u> Quality Control Inspector Level Date: <u>$8/21/13$</u>			

QUALIFICATION OF QUALITY CONTROL INSPECTORS-PROCEDURE QA 2.10.6.1.1

QUALIFICATION LIMITATION FORM QA 2.10.6.1.1 C

The named individual is hereby certified to perform Quality Control inspections, examinations and tests for the products of the Precision Surveillance Corporation and shall be limited in practicing those skills to those activities for which qualified as shown.

Name Clinton West

SSN

Quality Control Inspector Level II per ANSI N45.2.6 - 1973 or 1978

ACTIVITIES

POST TENSIONING SYSTEM:

SHOP: N/A

VENDOR: N/A

FIELD: All

TESTING: N/A OTHER: N/A

REINFORCING STEEL:

SHOP: N/A

CONSTRUCTION METALS:

STRUCTURAL FAB: N/A WELDING: N/A PAINTING-ANSI 101.4: N/A OTHER: N/A

GENERAL QUALITY ASSURANCE:

DOCUMENT CONTROL: Yes TEST REPORT APPROVAL: Yes PURCHASE ORDER APPROVAL: No NONCONFORMANCE REPORTING: Yes CALIBRATION: Yes

IOCIFR21 Yes

10CFR50 and PSC QUALITY ASSURANCE: Yes

APPROVED:

Strald Bussone

_____DATE: 8/21/13

Quality Control Inspector Level III

Topical Report 213 Attachment 3 Page 65 of 154



PROFESSIONAL SUMMARY

A. NAME: CLINT WEST

B. POSITION: FIELD SUPERINTENDENT

Responsible for set-up, supervising and managing field crew as assigned for special construction projects with or without labor.

C. EDUCATION:

- 1985: Graduated from Belleville High School- Belleville, AR
- □ 1985-1986: Attended Bryan Institute of Computer Programming

□ 1987-1991: U.S. Navy Aviation Machinist Mate 3rd Class (Jet Engineer Mechanic). Various commendations and medals. Assigned to U.S. Navy SEABEE Unit 406 Steel Workers

- **D. CERTIFICATIONS:**
- Journeyman Ironworker, Local 321
- Certified Four Position Welder
- OSHA 30 Hour Training
- Qualified Rigger

E. WORK EXPERIENCE:

- 3/1991-12/1991: William's Construction
- 12/1991-12/1995: Truck Driver
- 1/1996-6/2000: Maintenance/Milwright at Wayne Farms- Danville, AR
- 3/2000-12/2000: Laborer at Arkansas Nuclear One Unit 2 SGR
- G/2001-5/2004: IronWorker Local 591-Shreveport, LA
 - Several Foreman Positions, IW Steward
 - Numerous Structural Jobs
- 5/2004-Present: Iron Workers Local 321-Little Rock, AR
 - 5/2004-7/2005: Boyd Sanders Construction
 - 7/2005-1/2006: ANO Unit 1 SGR, Stone & Webster and SGT
 - 3 Reactor Head Changes with Bigge Crane and Rigging- San Leandro, CA
 - Superintendent on job in Bahamas rebuilding an oil transfer station off shore destroyed by Hurricane Katrina.
- 4/7/2008-Present: Precision Surveillance Corporation-East Chicago, IN
 - Worked as General Foreman, Foreman, Rigger, and Welder at various Nuclear Sites throughout the United States. Superintendent as of 9/2008.

3468 WATLING STREET · EAST CHICAGO · IN · 46312 P (219) 397-5826 · F (219) 397-5867 · WWW.PSCHUCLEAR.DOM

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F. NUCLEAR JOBSITE ACTIVITY

Involvement in Construction Management and/or supervision of post-tensioning or structural systems for the following nuclear projects:

- ANO-Arkansas Nuclear One
- UVC Summer Nuclear Plant
- Ginna Nuclear Station
- □ Millstone Nuclear Power Plant
- Byron Nuclear Plant
- Brunswick Nuclear Plant
- Fort Calhoun Nuclear Plant
- Point Beach Nuclear Plant
- □ Vogtle Nuclear Plant
- Palo Verde Nuclear Plant
- Braidwood Nuclear Plant
- Crystal River Nuclear Plant
- Palisades Nuclear Plant
- Waterford Nuclear Plant



PS Carter A	PSC PROCEDURE VT1, FORMS CERTIFICATION OF EXAMINERS EXHIBIT B Revision 0, April 28, 1999 Page 1 of 1
	Revision 1, 4/28/99; Revision 2, 7/6/99; Revision 3, 2/24/05; Revision 4, 08/31/07; Revision 5, 08/01/08; Revision 6, 09/04/08
PHYSICAL TESTI PHYSIC	ING OF INSPECTORS-PROC. QA 2.10.6.1.1.1 AL TESTING FORM QA 2.10.6.1.1.1
Name: <u>Clast</u> Title:	Wears Glasses <u>Fr-+Neq-</u>
1. PHYSICAL CHARACTERISTICS	
Rating: 1007 Comments ND 9	
2. VISUAL - FAR RANGE	Test Device <u>SNellering</u> Chart
Vision Rating %: ///D Left Comments <u>EXC</u>	20/20 Right 20/20 Both 20/15 elly sien in the olistance
with	9/c3/ta
3. VISUAL - NEAR RANGE	Test Device Sinc//FN/Acta - Cha-
	J-/ Right J-/ Both J.
3. VISUAL - NEAR RANGE	J-/ Right J-/ Both J./
3. VISUAL – NEAR RANGE Vision Rating Grade パクーン, Left Comments	J-/ Right J-/ Both J
3. VISUAL – NEAR RANGE Vision Rating Grade /	$\frac{2}{2} + \frac{2}{3} + \frac{2}$
3. VISUAL – NEAR RANGE Vision Rating Grade パクーン, Left Comments	J-/ Right J-/ Both J/ Test Device $Z_{\Xi}/\Lambda, \Lambda_{GF}, T_{F}, f_{\Xi}$ 2 3 4 5 7 8 9 10
3. VISUAL - NEAR RANGE Vision Rating Grade. '~'', Left Comments 4. COLOR PERCEPTION Plate: 1 6 11	J-/ Right J-/ Both J/ Test Device $Z_{\Xi}/\Lambda, \Lambda_{GF}, T_{F}, f_{\Xi}$ 2 3 4 5 7 8 9 10
3. VISUAL – NEAR RANGE Vision Rating Grade /	J-/ Right J-/ Roth J/ Test Device $Z_{S:\Lambda,\Lambda_{G,F}}$, $T_{T,T_{S}}$, 2 3 4 5 7 8 9 10 12 13 14 15 Perception $I_{C(S)}^{3}$, $T_{T,S}$
3. VISUAL - NEAR RANGE Vision Rating Grade .*->*, Left Comments 4. COLOR PERCEPTION Plate: 1 6 11 Score / 4 Of 14 Score shall not be less than 10 to b	J-/ Right J-/ Both J/ Test Device $Z_{5}/\lambda, \lambda_{0}, F_{7}/\lambda$. 2 3 4 5 7 8 9 10 12 13 14 15 Perception $I_{0}/5^{3/2}$. De acceptable for perception.
3. VISUAL - NEAR RANGE Vision Rating Grade .*->*, Left Comments 4. COLOR PERCEPTION Plate: 1 6 11 Score / 4 Of 14 Score shall not be less than 10 to b	J-/ Right J-/ Roth J/ Test Device $Z_{S:\Lambda,\Lambda_{G,F}}$, $T_{T,T_{S}}$, 2 3 4 5 7 8 9 10 12 13 14 15 Perception $I_{C(S)}^{3}$, $T_{T,S}$
3. VISUAL - NEAR RANGE Vision Rating Grade .*->*, Left Comments 4. COLOR PERCEPTION Plate: 1 6 11 Score / 4 Of 14 Score shall not be less than 10 to b	J-/ Right J-/ Both J/ Test Device $Z_{5}/\lambda, \lambda_{0}, F_{7}/\lambda$. 2 3 4 5 7 8 9 10 12 13 14 15 Perception $I_{0}/5^{3/2}$. De acceptable for perception.
3. VISUAL - NEAR RANGE Vision Rating Grade : ->->; Left Comments 4. COLOR PERCEPTION Plate: 1 6 11 Score 14 Of 14 Score shall not be less than 10 to b Comments >>> X C >>>	J-/ Right J-/ Both J/ Test Device $Z_{5}/\lambda, \lambda_{0}r, T_{7}/\tau, \tau_{7}$ 2 3 4 5 7 8 9 10 12 13 14 15 Perception 1005^{37} -> De acceptable for perception. -//rN/ $(2D/t_{7} - V_{1}) \cap N$
3. VISUAL – NEAR RANGE Vision Rating Grade .* -> -> , Left Comments 4. COLOR PERCEPTION Plate: 1 6 11 Score 14 Of 14 Score shall not be less than 10 to b Comments -> X C = OVERALL RATING Capability -> -> -> ,	J-/ Right J-/ Both J/ Test Device $Z_{5}/\lambda, \lambda_{0}r, T_{7}/\tau, \tau_{7}$ 2 3 4 5 7 8 9 10 12 13 14 15 Perception 1005^{37} -> De acceptable for perception. -//rN/ $(2D/t_{7} - V_{1}) \cap N$

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PRECISION SURVEILLANCE CORPORATION

TRAINING SHEET

THE PSC PERSONNEL LISTED BELOW HAVE BEEN PROVIDED AN OVERVIEW AND INDOCTRINATED TO PRECISION SURVEILLANCE CORPORATION'S QUALITY ASSURANCE MANUAL REVISION 5 (ALL SECTIONS)

NAME	SIGNATURE	SS#	DATE
CLINT WEST CARROLL HUNT	Chillent		619-13
ARROLL HUNT	Canof ylus		6-19-13

Busson TRAINER: DATE: 6/19/13



Training Sheet



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PRECISION SURVEILLANCE CORPORATION

TRAINING SHEET

THE PSC PERSONNEL LISTED BELOW HAVE BEEN PROVIDED COPIES OF 10CFR50 APPENDIX B, 10CFR PART 21, ANSI N45.2, ANSI N45.2.6, ANSI N45.2.10 FOR REVIEW AND UNDERSTANDING

NAME	SIGNATURE		DATE
CLINT NEST CARROLL HUNT	Col.t. Lift	· · · · · · · · · · · · · · · · · · ·	1-27-13 6-20-13
CATROLL HUNT	Carol 1/20		600.13
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Training Sheet ANSI

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WYC ELENENTARY

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WESTERN YELL COUNTY ELEMENTARY SCHOOL

PO Box 250 · Balleville, Arkansas 72824 Phone: 479/493-4100 · Fax: 479/493-4117

Keith Jones, Pri tcipal e-mail: jonesk@wolveri tes.k12.ar.us

Lisa Lawrence, Counselor e-mail: lawrencel@wolverines.k12.ar.us

Carol George, Secretary/Registrar e-mail: georgec@wolverinee.k12.ar.us

Julie Lane, Curriculum Coordinator e-mail: lansj@wolverin 35.k12.ar.us

June 4, 2013

To Whom I: May Concern:

Clint West graduated from Belleville High School on May 24, 1985.

I was Clint's school secretary as well as a family friend. He and my son were classmates.

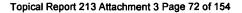
We do not have documentation other than the Transcript.

Sincerely,

4

eorgen

Carol George





5/31/13

Carol George Western Yell County Elementary 300 North Grand Avenue PO Box 250 Belleville, AR 72824

Dear Mrs. George,

Thank you for sending Clinton West's High School Record. Unfortunately, it does not state whether he completed High School. Therefore, we would also like to request any documentation/records that you may have of him completing/graduating High School. You may also provide a letter verifying he did graduate. Clint West is our employee and we need this information for his personnel file.

If you need any information from me, please call me at (219) 397-5826. Thank you in advance for your prompt attention to our request.

Sincerely.

Melissa Lara Administrative Assistant



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PSC QC INSPECTOR TRAINEE: CLINT	WEST	DATE: <u>8-21-</u>	2013
TEST SCORE: /00 %	PSC INSTRUCTOR: _	Hussone	8/21/13

PRECISION SURVEILLANCE CORPORATION QUALITY CONTROL INSPECTOR TRAINING PROGRAM

EXAM

- 1) What is the proper way to correct an error recorded on a data sheet ie: typo, obvious omission?
 - a) Write in changes or correct date
 - (b) Any changes made, one line initial and date
 - c) Write a nonconformance
- 2) When performing inspections what documents should you have with you?
 - a) Quality Assurance Manual
 - **b** Applicable Inspection Procedures
 - c) Calibration reports on inspection tools
- 3) Quality Control Inspectors shall be completely independent from the pressures of
 - a) Customers
 - b) Quality Assurance
 - (c) Production

4) The distance a tendon/wire stretches when being stressed is called, _____

- a) Liftoff
- b) Relaxation
- © Elongation

5) During stressing operations, which of the following cautions shall be observed?

- a) Do not stand behind the jack when it is under load
- b) Keep fingers out of any pinch areas
- c) Be alert during shim placement and removal
- (d) All of the above

- 6) The tendon shall never be stressed beyond _____% of the minimum guaranteed ultimate tensile strength (Guts) of the effective wires remaining in that tendon
 - a) 60 % (b) 80 % c) 100 %
- 7) When tendon stressing is performed from both ends simultaneously the pressure at

one end of the tendon shall not exceed the other by more than 1000 psi.

(a) True b) False

- The <u>minimum</u> temperature for grease being pumped into a tendon end is ______ degrees.
 - a) 120 degrees
 - (b) 150 degrees
 - c) 160 degrees
- 9) When cracks are detected for Anchor Heads, Shims or Bearing Plates, Turkey Point Engineering shall be notified by a nonconformance report.
 - a) True b) False
- 10) The Field Quality Control Inspectors operate under the immediate direction of:
 - a) Field Superintendent
 - b Lead Quality Control Inspector
 - c) PSC Manager Quality Assurance
- 11) Field Quality Control Inspectors and the Quality Assurance personnel have the authority to issue a "Stop Work Order" for any activity, material, or procedure not in conformance with:
 - a) Project specifications
 - b) Quality Assurance Manual
 - c) Surveillance I.S.I. Manual
 - (d) All of the above

12)

Field Changes that take place prior to the approval of a Field Change Request shall be documented on a NCR.

- Prior to applying ANY FORCE to a tendon the stressing adaptor must be fully 13) engaged.
 - (a) True
 - b) False
- 14) To find the actual liftoff/lock-off at a particular end of a tendon a 0.030" thick feeler gauge (shim stock) is inserted into the shim stack until consecutive liftoff/lock-off readings have been taken.
 - <u>a</u>) Two (2) (b) Three (3) c) Four (4)
- 15) Steel rulers are calibrated every:
 - a) 6 months
 - (b) I year
 - c) 5 years

16) When should Quality Control Documents be signed by the inspector?

- a) Before the next step
- b) At the end of the day
- (c) After all information for the inspections have been entered
- 17) Who controls the Measuring and Test Equipment used by PSC Inspectors?
 - a) PSC Superintendent
 - b) Utility employees
 - (c) PSC Quality Control or Quality Assurance personnel
- Where are all quality related documents pertaining to the project kept? 18)
 - a) In the inspector's desk
 - b Field office file or jobsite vault
 - c) With the PSC Superintendent
- 19) All Lead Field Quality Control Inspectors shall be qualified to a minimum of Level capability in accordance with the requirements of ANSI N45.2.6.
 - a) I
 - (b) II
 - c) III

20) The person responsible for recording inspection information on Data Sheets is the

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- a) Craft Crew Member
- (b) PSC QC Inspector
 - c) Foreman

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d) Any of the above



IWL VISUAL EXAMINER CERTIFICATION RECORD (EXHIBIT A)

Document:	FRM-PQR-001
Revision:	0
Date:	July 16, 2013
Document Type:	Corporation Standards
Page:	1 of 1

IWL GENERAL AND DETAILED VISUAL EXAMINER CERTIFICATION RECORD

	Training Requirements		Initials(Examinee/Instructor)	Date
	Training in Section XI, Subsection IWL (4 hours min		CW/EC	8/14/13
Traini	ing shall include requirements for inservice and preservic and reporting criteria for the following:(2 hours mini			
1)	Concrete (conditions such as those described in ACI-2	01.1)	CN/CEC	8/15/13
2)	Reinforcing steel	•	CW / CEC	8/15/1)
3)	Post-tensioning system items (e.g., wires, strands, and hardware, corrosion protection medium, and free water		CW/CEC	8/20/13
	Written Examination		Grade	Date
	ten examination covering Section XI, Subsection IWL rea specific procedure requirements for visual examination c 15 questions in the following:			alasta
1)	Concrete and Reinforcing Steel		93.3%	8/23/13
2)	Post-tensioning system components(i.e., wires, strands hardware, corrosion protection medium, and free water		100.0%	3/23/13
	Practical Examination		Grade	Date
A pr	actical examination using test specimens with flaws or in detected by the following visual examination techni			8/1
1)	General and detailed visual examination of concrete		9275	0/2413
2)	Detailed visual examination of reinforcing steel		9476	122/13
3)	Detailed visual examination of post-tensioning system wires, strands, and anchorage hardware)	components (i.e.,	96%	8/24/3
	Passing grades for visual examinations shall be as	follows:	Final Grade	Date
	An average combined grade of 80% for written and pra examinations	actical	95.1%	8/22/13
	A minimum grade of 70% for each written and practica	l examination		
	ision Surveillance Corporation certifles that the following poration Standard Document STD-PQR-001 "Personnel Examinations for Nuc	Qualification Requi	rements for General and Detailed	
	IWL Visual Examiner (Print Name):	Clint G. L	Vest	
	IWL Visual Examiner (Signature):	Chtale	wit	
	SS #(Last Four Digits)			- <u>-</u>
	Certification Date:	8-23-13		
	Certification Expiration Date:	8-22-18	3	
	P.S.C. Professional Engineer Approval(Name)	Christophe	r Eglox	
	P.S.C. Professional Engineer Approval(Signature)	14 stil	Elar	
		ENGLIS		

Document: EXM-PQR-001 IWL-2000 **Revision:** 0 WRITTEN EXAMINATION Date: July 16, 2013 **CONCRETE & REINFORCING STEEL** Document Type: **Corporation Standards** Page: 1 of 3 NAME: CLINTON W IEST DATE: 8-23-13 SOCIAL SECURITY NUMBER: GRADE: 14/15 = 93.3% 8/23/13 **GRADED BY:** I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration. I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter. lat. Col Na I have read and understand the above statements: ${\cal C}$ 8-23-13 Student Signature Date FILL IN ONE CIRCLE AS THE ANSWER FOR EACH QUESTION 8 С D А B С D С D A Α В 0 0 0 6 0 0 0 11 1 O O O 2 7 12 0 0 O 0 0 0 O • O O 8 13 3 0 0 ۲ 0 0 • Ο Ο റ O 9 14 4 0 0 Ο Ο 0 0 0 0 О C С 5 10 0 15 \cap \cap \cap \mathbf{C} \sim EXM-POR-001 R0 Topical Report 213 Attachment 3 Page 79 of 154

		IWL-2000	Document:	EXM-PQR-001
		WRITTEN EXAMINATION	Revision:	0
P	52		Date:	July 16, 2013
HLGIDS	BIL SHE HILLANGE	CONCRETE & REINFORCING STEEL	Document Type:	Corporation Standards
			Page:	2 of 3
1.	What is the function	n of the ANII?		
	a) To verify comp	llance with NRC regulations		
		ther approval signature on forms		
	c) To ensure nucl	lear safety		
	(d)) To verify comp	liance with applicable requirements of the ASME	Code 🗸	
2.	General Visual ins	pections are required to be performed on:		
		inment concrete surface and grease caps.		
	b) Tendon button			
	 c) Jacks/Rams us d) All of the above 			
	•			/
3.	What is the charac	ter height of the lower case letters for Detailed Vi	isual Inspections? V	•
	a) 0.010"			
	b) 0.105"			
	© 0.044"			
	d) 0.500"			
4.		is defined by the breaking away of small portions		e due to localized
	internal pressure v	which leaves a shallow, typically conical depression	on? V	
	a) Exudation			
	b) Laitance			
	C Popout			
	d) Encrustation			
5.	What is an optical	comparator?		
		termine color resolution		
	b) A device to ev	aluate vision easure surface lighting intensity		
	(d) None of the al	cove		
6.	Efflorescence is a	sign of V		
	(a) Mineral leachi	ng		
	D) Concrete addi			
	c) Nothing			
	d) Surface coatin	ng		
7.	Who may perform	IWL Visual examinations without certification? v		
	a) QC Personnel			
	 b) Level II ISI pe 			
	 C) A manager or (d) None of the all 	supervisor of ISI programs bove		
8.	Per ASME Section	n XI, subsection IWL what are to be given a gene	ral visual examinatio	in? /
	a) The safety sh	ces craft personnel are wearing		
	(b) The tendon g	allan poiling		
	(y) inetendon da	dilety county		
	c) Containment	tendon strand wedges or wire button heads of hard hats worn by personnel		

EXM-POR-001 R0

		IWL-2000	Document:	EXM-PQR-001
		WRITTEN EXAMINATION	Revision:	(
P	54		Date:	Juty 16, 2013
PRESION	DIS DURANCE AVICE	CONCRETE & REINFORCING STEEL	Document Type:	Corporation Standards
			Page:	
10 11 12	 a) After the inspe b) When requests c) When a Relevance d) Before use of i d) Before use of i e) In tendon anchorage a) 0.010 inch in w b) 0.100 inch in w c) 0.001 inch in w d) 1.000 inch in w d) 10 CFR 50.555 c) Appendix A d) 10 CFR 10.30 d) 10 CFR 10.30 d) A detailed visual in a) 7 feet b) 2 feet c) 35 feet d) 4 feet d) 4 feet d) Every 3 years c) Every 3 month d) Every year 	ed by the Registered Engineer ant Condition is found it ge areas, acceptable cracks in the concrete adja width width width width to 10 CFR 50 incorporated by reference the required Addenda? A a. hspection requires what maximum examination of 1 II re-certification required?	Page; neasured?	3 of 3 lates do not exceed.
14	concrete, presenc	wing degradation mechanisms to rebar is associes of an electrolyte, or microbiological attack? \checkmark	atéd with changes in	the permeability of
	a) Irradiation b) Fatigue			
	C) Corrosion			
	d) Thermal effec	ts /		
1:	5. Level II minimum	education required for certification is?		
	a) MBA degree (b) High school o	r equivalent		
	c) No education	I GYONAIGHL		
		ollege		
	d) One year of c			
	d) One year of c	-		
	d) One year of c	-		
	d) One year of c	-		

PSP	IWL-2000 WRITTEN EXAMINATION POST-TENSIONING COMPONENTS	Document: Revision: Date: Document Type: Page:	EXM-PQR-002 0 July 16, 2013 Corporation Standards 1 of 3
NAME: $CLINTDISOCIAL SECURITY NUMGRADE: \frac{15/15 = 100}{100}$)-23-13 	
administration that could c compromise by others pric I acknowledge that this ex	ved nor observed any aid or information regarding ompromise this exam's integrity. I also understan or, during, or subsequent to the exam administration amination is a way of demonstrating my knowledg	d my obligation to re on. le of the subject ass	eport any exam oclated with this
ensure my understanding	id the above statements: <u>Clith P Wit</u>	B-23	_
ւս, ւդրեր, հւյտեւ տել Գարանության հանկացիստ է մեն է են է։ Եւ	Student Signature	Date ACH QUESTION	

EXM-POR-002 R0

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	IWL-2000	Document:	EXM-POR-002
	WRITTEN EXAMINA	TION Revision:	0
P5	2	Date:	July 16, 2013
Hin Criteria Carriera	POST-TENSIONING COM	IPONENTS Document Type:	Corporation Standards
		Page:	2 of 3
1. Per IWL v	what tendon anchorages are exempt from D	Petailed Examination?	
a) inacc	essible due to structural obstructions		
b) Inacc c) Inacc	essible due to radiological hazards essible due to safety concerns the above		
	on IWL contains requirements for a Respon anal Engineer. What is he responsible for?	sible Engineer. He must be an exp	perienced Registered V
b) Evalu	nittal of the report to the Owner documenting uation of examination results		airs
	oval, instruction, and training of concrete ex i the above	amination personnel	
3. PSC Qua	alification for IWL Examiners certifications co	omply to: 🗸	
a) IWE			
	2001 edition with 2003 addenda 2010 edition with 2011 addenda 301		
	detailed examination used to detect on Cont for in-service inspection?	ainment Post Tensioning Systems	a (tendon anchorage)
	olved water in the grease unt of grease in the grease can		
c) Grea	ence of free water		
5. The tend	Ion bearing plate is to be given what kind of	visual inspection?	
a) Clos	•		
b) Gen (c) Deta			
d) Non			
6. What is t	the typical PSC procedure used for Anchora	ige Inspection? 🗸	
a) SQ 2			
b) SQ 1			
(C) SQ 8 d) SQ 4			
7. Followin	g the re-tensioning of a tendon that has bee	n de-tensioned a Detailed inspect	ion is used to detect.
	en wires or strands.		
	ount of nitrates in the grease.		
	perature of the concrete. 9 grease can has been gaivanized.		
	f the following is not typical equipment used	for IWL examination?	
(a) Pres	ssure gage		
b) Flas c) Carr			
c) Carr	ICIO		

··· ··· · · · · · · · ·

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d) Optical Comparator

061	シー	IWL-2000 WRITTEN EXAMINATIO	ON F	Document: Revision:	EXM-PQR-002
UNE DIGIDIO DE CAL	ATTET P(OST-TENSIONING COMPO	NICAITO -	Date: Document Type:	July 16, 2013 Corporation Standards
			1	Page:	3 of 3
9. Followin	g the re-tensionin	g of a tendon that has been de	e-tensioned a D	etailed inspection	n is used to detect:
(a) Brol	en wires or stran	ds.			
b) Amo	ount of nitrates in I				
	perature of the co e grease can has				
10. Per PS	Qualification for	IWL examinations who appro	ves the qualifica	ations of the Exam	miners? V
(a) Res	ponsible Engineer	r (P.E.)			
b) IWL	Supervisor	• •			
	ect Manager ect Superintender	nt			
11. What is	General Examina	tion used to detect on Contain	ment Post Tens	ioning Systems	(tendon anchorage)
selected	l for in-service ins	pection? 🗸			
	e of galvanizing o				
	ket seal on Greas cks in anchorage				
	e of the above				
	Detailed Examina I for in-service ins	ition used to detect on Contain	ment Post Tens	sioning Systems	(lendon anchorage)
	mistry of shim ma				
b) Mat	erial type of shim	material			
	placement of shim neter of Shims	S			
·					
	Detailed Examina for in-service ins	ation used to detect on Contain pection?	iment Post Ten:	sioning Systems	(lendon anchorage)
	n finish				
	sing button heads hor head finish	i			
-,	hing hardness				
	eral and Detailed	Examinations what is the min	imum near dista	ince vision acuity	the examiner must 🗸
have?					
		n in at least one eye.			
b) Nor c) 20/					
•	10 or better				
Post-Te		mpleted their Structural Integr IWL Examination of tendon an L?			
a) Eve	ry 6 months				
	ry 5 years				
	ry 3 years ry 2 years				

EXM-POR-002 R0

		IWL-2000	Document:	EXM-POR-00
		DETAILED VISUAL EXAMINATION (POST-TENSIONING SYSTEM	DF Revision:	· · · · · · · · · · · · · · · · · · ·
		COMPONENTS	Date:	July 16, 201
our la gran	L.C. MILL		Document Type:	Corporation Standard
		PRACTICAL EXAMINATION CHECKL	IST Page:	1 of
SOCIAL EXAM NI GRADE:				
		nination is a way of demonstrating my knov had the opportunity, on my request, to revi		
l acknow examinal ensure m	tion and that I have ny understanding of	nination is a way of demonstrating my know had the opportunity, on my request, to revi- the subject matter. the above statements:	ew this entire examination	on with the instructor to
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l acknow examinal ensure m	tion and that I have by understanding of ad and understand POINT VALUE 10 10 5 5 5	had the opportunity, on my request, to revisite subject matter. the subject matter. the above statements: Inspect Matter Matte	withis entire examination M 8.23-1 ture Date NTS GRANTED/COMM +/0 +/0 +5 +5	on with the instructor to
l acknow examinal ensure m	tion and that I have by understanding of ad and understand POINT VALUE 10 10 5 5 5 5 15	had the opportunity, on my request, to revisite subject matter. the subject matter. the above statements: INSPECTION POINTS Student Signal INSPECTION POINTS Select procedure Verify revision Select form Verify revision Select form Verify revision Select equipment Verify adequacy of lighting Prior to and during inspection Record part/item number On inspection form Inspect component/part Identify discontinuities	withis entire examination $M = \frac{8 \cdot 23 \cdot 1}{10}$ ture Date <u>NTS GRANTED/COMM</u> ± 10 ± 5 ± 5 ± 5 ± 15 $\pm 11 / (-4)$	on with the instructor to
l acknow examinal ensure m	ion and that I have by understanding of ad and understand POINT VALUE 10 10 5 5 5 5 15 15 15	had the opportunity, on my request, to revisite subject matter. the subject matter. the above statements: Inspect Matter Matte	withis entire examination $M = 8 \cdot 23 \cdot 1$ ture Date <u>NTS GRANTED/COMM</u> $\pm 1/0$ $\pm 1/0$ ± 5 ± 5 ± 5 ± 15 $\pm 11/(-4)$ ± 25	on with the instructor to
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l acknow examinal ensure m	POINT VALUE 10 10 10 5 5 5 15 15 15 25 5	had the opportunity, on my request, to revisite subject matter. the subject matter. the above statements: Inspect Matter Signal INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision Select form Verify revision Select form Verify calibration/resolution Verify adequacy of lighting Prior to and during inspection Record part/item number On inspection form Inspect component/part Identify discontinuities Compare discontinuities to Recording criteria in procedure Correctly record discontinuities Sign and date form	withis entire examination $M = 8 \cdot 23 \cdot 1$ ture Date <u>NTS GRANTED/COMM</u> $\pm 1/0$ $\pm 1/0$ ± 5 ± 5 ± 5 ± 15 $\pm 11/(-4)$ ± 25	on with the instructor to

Topical Report 213 Attachment 3 Page 85 of 154

PRECISION SURVEIL LANCE		
Project: FARLEY 2012 TENDON SURVEIL		2
(7.3)Tendon No.: <u>1</u> Tendo	on End: <u>Source</u> Shop	
ANCH	IORAGE INSPECTION CRITERIA	
As-Found Post De-Tensioning	y / Pre-Wire Removal Post Re-Tensioning	Q.C. Signoff
9.0 & 10.0 - CORROSION & CRACK INSPECTION		
(9.2) Buttonheads Level: B (1)	(10.1) Cracks 🗌 Yes 🕫 🗹 No 🔲 N/A	
(9.2) Anchorhead Level: B (1)	(10.1) Cracks 🗌 Yes 🧖 🔀 No 🗍 N/A	
(9.2) Bushing Level: B (1)	(10.1) Cracks 🗌 Yes (2) 😡 No 🔲 N/A	
(9.2) Shims Level: <u>B (1)</u>	(10.1) Cracks 🔲 Yes 🏨 🖾 No 🔲 N/A	a14
(9.2) Bearing Plate Level: B	(10.1) Cracks 🔲 Yes ⁽²⁾ 🕅 No 🗌 N/A	Colt 8-23-13
	npose a sketch of the cracks on Sketch Sheet 8.0 and initiate a NCR.	
11.0 - BUTTONHEAD INSPECTION		
Offsize (Malformed)		
 Protruding/unseated wire/buttonheads 		
Ø Broken/missing wire/buttonheads	3- 000000 .9"	
Previously identified as missing		
Discontinuous – removed		
wire(s) being removed during this surveillance for testing	F (000000000000000000000000000000000000	
 (11.2) Anchorhead I.D. RX200 Located on Sketch: X Yes □ No Bushing I.D. <u>IN 32.6</u> Located on Sketch: X Yes □ No (11.4) Missing Buttonheads Found: X Yes □ No Quantity: 1 Additional Information: SNIM STACK 	M 50 0000000000000000000000000000000000	
HEIGHT 4" /ONE SET OF 4'S		Cust 8-23-13
/*************************************	2 (8.3) Light Meter ID: \/A Cal Due: \/A 1	
(12.7) Overall Results I Acceptable Un-Ac	cceptable Customer Notified NCR#:	(WA 8-23-13
QC Reviewed:	Level: Date:	
MOTE: SI-11M GAP TO WIDE	ON ONE SIDE: .6" 175	5Q 8.0.FA.12 ISI
NO GAP ON OTHER S	SLDE Report 213 Attachment 3 Page 86 of 154	

Document: EXM-PQR-004 IWL-2000 **Revision:** 0 DETAILED VISUAL EXAMINATION OF **REINFORCING STEEL** July 16, 2013 Date: Document Type: **Corporation Standards** PRACTICAL EXAMINATION CHECKLIST Page: 1 of 3 NAME: CLINTON WEST DATE: 8.23.13 SOCIAL SECURITY NUMBER: EXAM NUMBER: INSTRUCTOR/GRADED BY: GRADE: I have neither given, received nor observed any aid or information regarding this examprior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration. I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter. St. Colum I have read and understand the above statements: 8-23-13 Date and a second state of the second s POINT VALUE INSPECTION POINTS POINTS GRANTED/COMMENTS Select procedure 10 +10 Verify revision Select form 10 +10 Verify revision Select equipment + 5 5 Verify calibration/resolution Verify adequacy of lighting + 5 5 Prior to and during inspection Record part/item number +5 5 On inspection form Inspect component/part +15 15 Identify discontinuities Compare discontinuities to + 15 15 Recording criteria in procedure Correctly record discontinuities 25 +21 Sign and date form 5 Complete form 5 Accurate and legible TOTAL +94

Topical Report 213 Attachment 3 Page 87 of 154

PRECISION SURVENELANCE	N1078 PSC PROCEDURE SQ 8.3 BEARING PLATE INSPECTION DATA SHEET SQ 8.3 February 29, 2012 Page 1 of 1 Revision 0
Project: FARLEY 2012 TENDON SURVEILLANCE	
Tendon No.: 1 Tendon End: EAST	Shop ///AField
(7.4) Bearing Plate Identification #: M_D (D++	_ /
 Orient the bearing plate with the sketch below. Locate the bearing plate identification and document the location on the sketch. Sketch all cracks, including other defects, existing on the concrete in the area sun 24 inches from the edge of the bearing plate. For cracks equal to or wider than 0.010 inches, document condition on an Nonce 	
Procedure QA 9.0, NONCONFORMANCES, for Southern Nuclear approval.	
SPALL BOLTS	-X.100 1.2.6'X.080 49" <u>YD.140</u> 19" <u>YD.140</u>
G.G'X.050. On Hoop and dome this edge is	PIECES 7X.180
SEVERAL AREAS OF EFFLORESENSE & AT TOP CENTER 3 ALONG BOTTOM SEVERAL AREAS OF Up. Vertical Tendon, this is toward the center of the containment. NO ID #	SPALLS: +
11×010	4.5"Y.ObD
SPALLED APEAS	SPALLED AREA
Light Conditions 50fc or greater. Yes No Auxiliary Light Source used:	
(7.3) Light Meter ID: N/A Date due calibration: N/A	<u>, , , , , , , , , , , , , , , , , , , </u>
(7.5) Cracks $\ge 0.010^{\circ}$ [2] Yes [] No Quantity: 1 Max. Width: 180 Max	Length: 12.6 NCR#:
QC Inspector: CLINT WEST/ Util Off Level:	Date: 8-23-13
QC Reviewed: Level:	Date:

Topical Report 213 Attachment 3 Page 88 of 154

	IWL-2000		
neel	GENERAL & DETAILED VISUAL	1	
254	EXAMINATION OF CONCRETE	Date:	July 16, 2
	PRACTICAL EXAMINATION CHECK	Document Type:	Corporation Standa
		Page:	1 (
	1.1	0 27-12	an a
•	WEST DATE	:: <u>8-2>7></u>	
SOCIAL SECURITY NUME	BER:		
EXAM NUMBER: 3	main an Automation	4	
GRADE:	INSTRUCTOR/GRADED BY:	Aug Eliz, P.	E. 8/23/13
ensure my understanding of	e had the opportunity, on my request, to revi of the subject matter. d the above statements:	iew this entire examinatio	n with the instructor
examination and that I have ensure my understanding of	of the subject matter.	H B-23-1	in with the instructor
examination and that I have ensure my understanding of	of the subject matter. d the above statements: <u>UH-UU</u> Student Signa INSPECTION POINTS PO	H B-23-1	3
examination and that I have ensure my understanding of I have read and understand	of the subject matter. d the above statements: <u>UH-UU</u> Student Signa INSPECTION POINTS PO Select procedure	ature B-23-1 Date Date	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10	of the subject matter. d the above statements: Student Signa INSPECTION POINTS PO Select procedure Verify revision Select form	the B-23-1 ature Date Date Date Date Date Date	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10 10	of the subject matter. d the above statements: Student Signa INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision	ature B-23-1 Date Date	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10	of the subject matter. d the above statements: INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision Select equipment Verify calibration/resolution	the B-23-1 ature Date Date Date Date Date Date	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10 10	of the subject matter. d the above statements: INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision Select equipment	the B-23-1 ature Date Date Date Date Date Date	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10 10 5	of the subject matter. d the above statements:	$\frac{4}{2} \frac{B \cdot 23 \cdot 1}{Date}$ Date DINTS GRANTED/COMM $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10 10 5 5	of the subject matter. d the above statements:	$\frac{4}{2} \frac{B \cdot 23 \cdot 1}{Date}$ Date DINTS GRANTED/COMM $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	3
examination and that I have ensure my understanding of I have read and understand POINT VALUE 10 10 5 5 5	of the subject matter. d the above statements:	$\frac{4}{2} \frac{B \cdot 23 \cdot 1}{Date}$ Date DINTS GRANTED/COMM $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	3
examination and that I have ensure my understanding of I have read and understand 10 10 5 5 5 15	of the subject matter. d the above statements:	$\frac{4}{2} \frac{B \cdot 23 \cdot 1}{Date}$ Date DINTS GRANTED/COMM $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	3
examination and that I have ensure my understanding of I have read and understand 10 10 5 5 5 15 15	of the subject matter. d the above statements:	$\frac{4}{2} \frac{B \cdot 23 \cdot 1}{Date}$ Date DINTS GRANTED/COMM $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$ $\frac{1}{10}$	3
examination and that I have ensure my understanding of I have read and understand 10 10 5 5 5 15 15 15 25	of the subject matter. d the above statements: UUUUU Student Signal INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision Select equipment Verify calibration/resolution Verify adequacy of lighting Prior to and during Inspection Record part/item number On inspection form Inspect component/part Identify discontinuities Compare discontinuities to Recording criteria in procedure Correctly record discontinuities Correctly record discontinuities	$ \frac{1}{2} = \frac{1}{2} + 1$	3
examination and that I have ensure my understanding of I have read and understand 10 10 5 5 5 15 15 15 25 5	of the subject matter. d the above statements: UUUUU Student Signa INSPECTION POINTS PO Select procedure Verify revision Select form Verify revision Select equipment Verify calibration/resolution Verify adequacy of lighting Prior to and during Inspection Record part/item number On inspection form Inspect component/part Identify discontinuities Compare discontinuities to Recording criteria in procedure Correctly record discontinuities Sign and date form Complete form Complete form	$ \frac{4}{23-1} $ Data Data Data Data Data Data Data Da	3

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N1078 PSC PROCEDURE SQ 8.4 CONCRETE EXTERIOR DATA SHEET SQ 8.4 February 29, 2012 Page 1 of 1 Revision 0

	N – GENERAL VISUAL EXAMINATIO			
Project Farley Surveillance #	#Year2012			
Inspection Area: 2	1/2-1			
Equipment Used RULER, FERLER GAUGE	P. OPTICAL COMPARATOR		į	
▼ 	<u>/ /</u>		, 	
	crete Surface Condition			
Containment Surface (Findings and Description)		NI	10	RI
HEPPUTS NOTED ON SKETCH SHEET	- 8.4 ONE IS & 2"DIA.			X
ARRASIONS NOTED ON SKETCH SHEE	TB.Y			
(Reaches !! !!	11			X
INFLD SLAG RURN "	f .		R	
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na 2018 m a 2019 a. a. ¹⁹ 17 a. 1 ₉₁₈ marty 198m, a. 20 a. 1988 mag <u>1917 a.</u> 2018 mag 2018 a. 2018 a		╾┼┝╤╡╌	┝╞╡╴	┼┾╡
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	<u> </u>	<u> </u>	┟╴╞═╣╴	┼┝┥
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	•			
(Use as many sketch sheets (page 2) as neede		or Inform	nation	Only
	arpose of documentation and orientation.)			
Recordable Indication	ns to be Examined For (PSC Procedure 8.4)			
Leaching or Chemical Attack	Deterioration of any Concrete Coating (if appli	cable)		
Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surfaces			
Popouts and Voids	Corrosion on Grease Cans, Bearing Plates or A			
Cracks	*Excessive Corrosion on Exposed Embedded	Metal Surfa	ICE9	
Scaling Spalls	*Detached Embedments or Loose Bolting *Indication of Degradation Due to Vibration			
Corrosion Staining on the Concrete Surface	(* The owner/agent must be notified for the	e noted con	ditions.")
Exposed Reinforcing Steel				,
Surface Patches or Repairs				
Comments and Disposition by Responsible Engineer		Jnacceptable	2	
Comments:				
• ·		<u> </u>		
		3-20-1	2	
Responsible Engineer:	Date:			

ANII:

18a SQ 8.4 FA.12 ISI

Date:



Project:	FARLEY NUCLEAR S	TATION 2012 TEND	ON SURVEILLANCE		
nspection Are	a: <u>2</u>				<u></u>
	n or attach photographs to p			s necessary.	
NSP.	ELD ATTER (SLAG BURN)	LOOKING WE	5 7 ° 1°	Popur 2.3	' DIA.
~)	C .		K	
			ABRASION	Ó.	•
	CPACK Ju"x7.6	340	AGRASION	12	
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		· ·	(PAC)	K APPT 60"X >.0	4 4
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		1 20-13			
	CRACK 31'X CESS	t grad			• • •
	.049			Spour 72">c)
	- CROKK WH 8-201	3		3	
	Wet 8-201				
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	· · ·		. The second sec		. 4 T -
			ABRASIOI		
Comments:				:	<u> </u>

Project: FARLEY 2012 TENDON SURVEILLANCE I UNIT 1 UNIT 2 Tendon No.:	PRECISION SURVEILLANCE	N1078 PSC PROCEDURE SQ 8.3 BEARING PLATE INSPECTION DATA SHEET SQ 8.3 February 29, 2012 Page 1 of 1 Revision 0
 Orient the bearing plate identification and document the location on the sketch. Statch all cracks, including ather defects, skisting on the concrete in the area surrounding the tendon anchorage for a distance of 24 inches from the edge of the bearing plate. For cracks equal to a wider than 0.001 inches, document condition on an Nonconformance Report in accordance with Procedure QA 8.0, Noncoicorgunces, for Southern Nuclear approval. I. Hard State Control (14/15) (14/		
2. Locate the bearing plate identification and document the location on the sketch. 3. Sketch all cracks, including other defects, existing on the concrete in the area surrounding the tendon anchorage for a distance of 24 inches from the edge of the bearing plate. 4. For cracks equal to or wider than 0.010 inches, document condition on an Nonconformance Report in accordance with Procedure GA 9.0, Nonconscreptions, So Southern Nuclear approvel. (H'X010 (0.5'X, 0.4'0) (1.25'Y, 0.1'0) (1.2	(7.4) Bearing Plate Identification #: DAVE DID IT	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	 Locate the bearing plate identification and document the location on the sketch. Sketch all cracks, including other defects, existing on the concrete in the area sur 24 inches from the edge of the bearing plate. For cracks equal to or wider than 0.010 inches, document condition on an Noncommutation of the section of the secti	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	14"XDIO 10.5"X.040 11.	
$\begin{array}{c c} CRALK FILLED \\ W/LEALHING \\ ANT MEASURE \\ ANT MEASURE \\ CANT MEASURE \\ CANT MEASURE \\ CANT MEASURE \\ SOME GROUTED \\ SOME GROUTED \\ SOME OT \\ CALLED \\ SOME OT \\ CALLED \\ CALLE$	On Hoop and dome this edge is up. DAVE D/D /7 Vertical Tendon, this is toward the center of the containment.	
$\frac{12 \text{ Cut PFF-BOLTS}}{\text{Some GROUTE}} = \frac{12 \text{ Cut PFF-BOLTS}}{\text{Cut PFF-BOLTS}} = 12 \text{ Cut $		KC.DID
Light Conditions 50fc or greater: I Yes[No Auxiliary Light Source used: I Yes[No Describe: N/A (7.3) Light Meter ID: N/A Date due calibration: N/A (7.5) Cracks $\geq 0.010^{\circ}$ Image: State of the sta	12 CUTOPF BOLTS SOME GROUTED O SOME NOT COND	SPALED
(7.3) Light Meter ID: N/A Date due calibration: N/A (7.5) Cracks $\geq 0.010^{\circ}$ Pres DNo Quantity: 4 Max. Width: 040 Max Length: $14''$ NCR#: QC Inspector: $CLINTWEST/Children Level: Date: 8-23-13$		K ISIZE - J. J
(7.5) Cracks $\geq 0.010^{\circ}$ Pres \square No Quantity: <u>4</u> Max. Width: <u>040</u> Max Length: <u>14</u> " NCR#: QC Inspector: <u>CLINT WEST/Childurate</u> Level: Date: <u>8-23-13</u>		□Yes[Ž]No Describe: <u>// A</u>
QC Inspector: CLINT WEST/Chitilout Level: Date: 8-23-13		Length: / L/ "NCR#:
QC Reviewed: Level: Date:		
	QC Reviewed:	Date:

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IWL VISUAL EXAMINER CERTIFICATION RECORD (EXHIBIT A)

Document:	FRM-PQR-001
Revision	0
Date:	July 16, 2013
Occument Type:	Corporation Standards
Page:	1 of 1

IWL GENERAL AND DETAILED VISUAL EXAMINER CERTIFICATION RECORD

				I
The second s	Training In Section XI, Subsection IWL (4 hours minimum)		Rap / VEC	Idialis
	Il include requirements for inservice and preservi id reporting criteria for the following:(2 hours min			
1) Concr			RAP / CEC	10/18/13
2) Reinfo	prcing steel		RAP / CEC	10/18/13
	ensioning system items (e.g., wires, strands, and rare, corrosion protection medium, and free wate		RAP / CEC	10/18/13
	Written Examination		Grade	Date
	mination covering Section XI, Subsection IWL re procedure requirements for visual examination of 15 questions in the following:			
1) Concr	rete and Reinforcing Steel		86.6%	10/18/13
	ensioning system components(i.e., wires, strand vare, corrosion protection medium, and free wate		86.6%	10/18/13
	Practical Examination		Grade	Date
	examination using test specimens with flaws or la tected by the following visual examination techni			
1) Gener	1) General and detailed visual examination of concrete 93%		10/18/13	
2) Detail	ed visual examination of reinforcing steel		93%	10/18/13
 Detailed visual examination of post-tensioning system components (i.e., wires, strands, and anchorage hardware) 		95%	10/18/13	
Passing grades for visual examinations shall be as follows:		s follows:	Final Grade	Date
An average combined grade of 80% for written and practical 90.8% examinations		10/18/13		
	imum grade of 70% for each written and practica			
	urveillance Corporation certifies that the following Standard Document STD-PQR-001 "Personnel Examinations for Nuc	Qualification Requi	rements for General and Detailed	
	IWL Visual Examiner (Print Name):	Ronald A. Perr	<u>/</u>	
- - 	IWL Visual Examiner (Signature):	Phal	2 a Pm	
	SS #(Last Four Digits)		F	
Certification Date: 10/18/13		, PERTMI	2111-	
		0/17/16 SPECIFIC Reg	guest	
	P.S.C. Professional Engineer Approval(Name)	Chirlstoppor E	10pm// VEL 11/	5/13
P.8	S.C. Professional Engineer Approval(Signature)	Chiller	2.12	· · ·
		/		

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CERI	FIFICATE OF QUALIFICATION
This is to certify that:	
Ronald Perry	SSN SSN
has been qualified through on-the	-job experience and formal training to meet the requirements of
ANSI N45.26-1973 and 1978 as:	
QUALITY CONTROL INSPECT	FOR <u>LEVEL II</u> with the following limitations.
Inspections and Calibrations asso	ciated with Post-Tensioning Systems and Components.
of this qualification. This qualification becomes effect Recertification date of <u>10/17/16</u> of	the Precision Surveillance Corporation and within the limitation tive <u>10/17/13</u> and shall remain in effect until the or until such time that the named individual leaves the
employment of PSC, gives just ca training to maintain a proper Qua	ause for termination of the certification or requires additional lity Control disposition.
training to maintain a proper Qua	
training to maintain a proper Qual PHYSICAL REQUIRMENTS: E	lity Control disposition.
training to maintain a proper Qua PHYSICAL REQUIRMENTS: E	lity Control disposition. Eye Exam Date <u>10/17/13</u> to <u>10/17/14</u> by <u>PSC</u>

ALIFICATION LIMITATION F	ORM QA 2.10.6.1.1 C
tests for the products of the	ereby certified to perform Quality Control inspections, examinations and Precision Surveillance Corporation and shall be limited in practicing ies for which qualified as shown.
Name Ronald Perry	SSN SSN
Quality C	Control Inspector Level II per ANSI N45.2.6 – 1973 or 1978
	ACTIVITIES
POST TENSIONING SYSTE	:M:
SHOP: N/A	
VENDOR: N/A	
FIELD: All	
TESTING: N/A	
OTHER: N/A	
REINFORCING STEEL:	
SHOP: N/A	
CONSTRUCTION METALS	1
STRUCTURAL FAB:	N/A
WELDING: N/A	
PAINTING-ANSI 101	.4: N/A
OTHER: N/A	
GENERAL QUALITY ASSU	RANCE:
DOCUMENT CONTR	
TEST REPORT APPR PURCHASE ORDER	
	APPROVAL: NO CE REPORTING: Yes
CALIBRATION: Yes	-
IOCFR21 Yes	
IUCIFR50 and PSC QI	UALITY ASSURANCE: Yes
APPROVED: Hera	1. Bussance DATE: 10/17/13
Qua	lity Control Inspector Level III

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SUMMARY:

1

Mr. Perry is a Program Engineering, Quality Assurance and NDE professional with exceptional organization, communication and leadership capabilities. Proven record of working independently and as part of a team to reach company goals. Solid problem solving and analytical thinking skills used daily to drive continuous improvement. Knowledgeable of ASME Codes, ASTM Standards, SNT-TC-1A and ANSI Standards.

TECHNICAL SKILLS:

Certified Lead Auditor per NQA-1 and ANSI N 45.2 Auditor; PSI / ISI Development; Engineering Program Development; NDE Level III in three disciplines (PT, MT and VT); Training Instructor in accordance with Systematic Approach to Training (SAT); Procedure Development.

EXPERIENCE:

07/13 - Present	PRAIRIE ISLAND NUCLEAR GENERATING PLANT
	Assessor
	Perform assessments of Maintenance and Radiation Protection;
	Perform assessment of SGR activities of contractor personnel /
	programs;
	Prepare and implement assessment report;
	Generate CAP for nonconformances.
09/12 - 03/13	

08/12 - 03/13 NUCRANE MANUFACTURING <u>QC Supervisor</u> Supervised QC Inspector personnel in Mechanical, Electrical, Coating, NDE and CWIs; Supervised Receipt Inspection of safety-related and non- safety -

79 AVIATOR PLACE, OAKLAND, MAINE 04963

1-877-965-TSSD (8773) RECRUITING@TSSDSERVICES.COM

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related parts / items; Revised (streamlined) inspection procedures and associated inspection forms; Interface with suppliers to resolve material and documentation deficiencies; Interface with Engineering on resolution of material deficiencies (NCRs); Review customer specification for compliance; Assisted on an NQA-1 audit as a Technical Specialist.

- 08/10 08/12 MOX PROJECT
 - QA Specialist 5

Perform surveillance of suppliers (internationally) to ensure compliance to their QA program (ISO and NQA-1); Review supplier procedures for compliance to codes/standards/specifications; Prepare surveillance and supplier deficiency reports as required;

Verify corrective actions are effective and close-out deficiency reports;

Lead Auditor in accordance with the requirements of NQA-1; Level II Receipt Inspector.

- 11/09 07/10PEGASUS STEEL
Nuclear Quality Manager
Develop and implement a Nuclear Quality Program;
Developed and obtained ASME U and R stamp;
Responsible for housekeeping and 5-S initiatives;
Maintain Nuclear Approved Suppliers List;
Establish, delineate and review organizational quality policies;
Review Purchase Orders and establish flow down requirements;
QA Manager for ISO 90001.
- 12/07 11/09 MOX PROJECT <u>QA Specialist</u> Certified Lead Auditor per NQA-1; Certified Level II Receipt Inspector;



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	Prepare and implement audit and surveillance checklists; Perform audits and surveillances at MOX site and vendor / supplier shops; Prepare audit and surveillance reports; Review vendor / supplier procedures for compliance (both foreign and domestic); Review Engineering and Procurement documents for compliance; Review vendor / supplier QA Manuals for compliance; Initiate Condition Reports; Verify effective corrective has been implemented; Familiar with commercial Grade Dedication process.
08/07 - 11,	07 WELDING SERVICES INC. (WSI) <u>QC / NDE Inspector</u> Develop surveillance checklists and establish QC hold points; Perform NDE as a Level II in MT, PT and VT disciplines; Prepare outage summary manuals for client; Perform surveillance activities at vendor / supplier shop.
01/07 - 05	07 NATIONAL ENRICHMENT FACILITY <u>QA Auditor</u> Perform audits; Prepare and perform surveillances of subcontractor activities; Review subcontractor procedures for compliance.
09/06 - 11	06 TAI (TOURGEE & ASSOCIATES, INC.) <u>QC / NDE Inspector</u> Perform visual and ultrasonic thickness examinations on Tanks and peripheral equipment; Prepare examination reports for submittal to client; Interface with client regarding examination results and established examination priorities.
02/06 - 03	06 LIMERICK GENERATING STATION

ISI Coordinator

Prepare examination packages;

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Assign NDE technicians to perform ISI examinations; Review NDE reports for accuracy prior to submittal to the client; Track NDE reports and initiate nonconformance reports as required; Develop 90 Day Summary Report for client for submittal to the

NRC.

- 03/05 04/05 NINE MILE POINT NUCLEAR STATION NDE Technician Perform NDE examinations in support of refueling outage and prepare NDE reports
- 12/02 02/05 DAVIS BESSE NUCLEAR POWER STATION

<u>Senior Nuclear Specialist – BACC Program Owner</u>
Took worst Boric Acid Corrosion Control Program in nuclear history to the best;
Develop and implement a compliant BACC Program;
Track and trend boric acid leakage;
Developed and implemented inspection procedures;
Initiate and prepare responses to Condition Reports;
Developed and implemented a training and qualification program for BACC inspection personnel.

1983 - 2002BEAVER VALLEY POWER STATION
Advanced Nuclear Specialist - QA Lead Auditor (1999 - 2002)
Prepare audit checklists and MAPS for continuous auditing;
Perform audits on Operations, Maintenance, Construction,
Licensing, Health Physics, Engineering, Document Control /
Records Management, Measuring &Testing Equipment Program;
Prepare audit reports;
Initiate Condition Reports and verify effective corrective actions
have been implemented;
Perform and evaluate Self-Assessments.

Supervisor NDE and NDE level III (1983 - 1999) Supervise / direct NDE personnel in the conductance of PSI and ISI

Page 5 of 5



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	examinations;
	Supervise / direct the development and implementation of NDE procedures;
	Supervise / direct the development and implementation of a
	training and qualification program;
	Interface with regulatory personnel (NRC, ANI and ANII);
	Training Instructor per Systematic Approach to Training (SAT);
	Prepare and implement training (NDE) per SAT;
	Supervise / direct the implementation of an M&TE Program for NDE equipment;
	Attend and participate in ASME Section XI Code committee meetings;
	Prepared initial IWE/IWL program plan (Level II Visual Examiner for
	IWE / IWL).
1969 - 1979	UNITED STATES AIR FORCE
	NDE Technician / Supervisor
	Perform and supervise NDE personnel in the conductance of UT,
	MT, PT, RT, ET and VT examinations;
	Received USAF Commendation Medal.
EDUCTION:	
	University of Maryland
	Bachelor of Science Business Management - 1981;
	Instructor Training (SAT);
	Root Cause Analysis;
	NDE Training USAF, Chanute AFB, Rantoul, IL.;
	Systems Training (PWR);
	Graduate of Dale Carnegie.

PASSPORT:

Number 307319512, expires 2016

	PSC PROCEDURE VT1. CERTIFICATION OF EXA EX
P5C	Revision 0, April 2
PREDIBION SHE BILLANGE	Pa Revision 1, 4/28/99; Revision 2, 7/6/99; Revision 3, Revision 4, 08/31/07; Revision 5, 08/01/08; Revision 6,
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5.OVERALL RATING	
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Examiner e 54	Title RETIDENT Date 10/15
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PRECISION SURVEILLANCE CORPORATION

TRAINING SHEET

THE PSC PERSONNEL LISTED BELOW HAVE BEEN PROVIDED AN OVERVIEW AND INDOCTRINATED TO PRECISION SURVEILLANCE CORPORATION'S QUALITY ASSURANCE MANUAL REVISION 5 (ALL SECTIONS)

NAME	SIGNATURE	SS#	DATE
Ronald A. Perry	Rapy		10/17/13
		- 	
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		·····	

TRAINER: ABussone DATE: 10/17/13

Training Sheet -QAM new logo



PRECISION SURVEILLANCE CORPORATION

TRAINING SHEET

THE PSC PERSONNEL LISTED BELOW HAVE BEEN PROVIDED AN OVERVIEW AND INDOCTRINATED TO THE FOLLOWING STANDARDS AND DOCUMENTS: 10CFR50 APPENDIX B, 10CFR PART 21, ANSI N45.2, ANSI N45.2.6, ANSI N45.2.10 AND THE PRECISION SURVEILLANCE CORPORATION QUALITY ASSURANCE PROCEDURES.

NAME	SIGNATURE	SS#	DATE
Ronald A. Perny	Ra Py		10/17/13
	(
			÷

TRAINER: <u>LiBussone</u> DATE: 10/17/13

Training Sheet Standards new logo

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PSC QC INSPECTOR TRAINEE:	Rona 1	11	<u>A.</u>	Perry	DATE:_	10/17/13

95% TEST SCORE:

PSC INSTRUCTOR: ABussine

PRECISION SURVEILLANCE CORPORATION QUALITY CONTROL INSPECTOR TRAINING PROGRAM

EXAM

- 1) What is the proper way to correct an error recorded on a data sheet ie: typo, obvious omission?
 - a) Write in changes or correct date
 - Any changes made, one line thru, initial and date
 Write a nonconformance
- 2) When performing inspections what documents should you have with you?
 - a) Quality Assurance Manual
 - (b) Applicable Inspection Procedures
 - c) Calibration reports on inspection tools

3) Quality Control Inspectors shall be completely independent from the pressures of line management / Production

- a) Customers
- b) Quality Assurance
- (C) Production

4) The distance a tendon/wire stretches when being stressed is called, _____

- a) Liftoff
- b) Relaxation
- (C) Elongation

5) During stressing operations, which of the following cautions shall be observed?

- a) Do not stand behind the jack when it is under load
- b) Keep fingers out of any pinch areas
- c) Be alert during shim placement and removal
- (d) All of the above

6) The tendon shall never be stressed beyond _____% of the minimum guaranteed ultimate tensile strength (Guts) of the effective wires remaining in that tendon

a) 60 % 6) 80 % c) 100 %

7) When tendon stressing is performed from both ends simultaneously the pressure at

one end of the tendon shall not exceed the other by more than 1000 psi.

(a) Trueb) False

- - a) 120 degrees F min., 150 degrees F max.
 - b) 150 degrees F min., 180 degrees F max.
 - (c) 180 degrees F min., 250 degrees F max.
- 9) When cracks are detected for Anchor Heads, Shims or Bearing Plates, Exelon Engineering shall be notified by a nonconformance report.

a True

b) False

10) The Field Quality Control Inspectors operate under the immediate direction of:

a) Field Superintendent b) Lead Quality Control Inspector PSC Manager Quality Assurance

(.5)

- 11) Field Quality Control Inspectors and the Quality Assurance personnel have the authority to issue a "Stop Work Order" for any activity, material, or procedure not in conformance with:
 - a) Project specifications
 - b) Quality Assurance Manual
 - c) Surveillance I.S.I. Manual
 - (d) All of the above

12)

Field Changes that take place prior to the approval of a Field Change Request shall be documented on a NCR. Nonconformance Report

- 13) Prior to applying ANY FORCE to a tendon the stressing adaptor must be fully engaged.
 - (a) True
 - b) False
- 14) During Tendon liftoff monitoring of a tendon, a 0.030" thick feeler gauge (shim stock) is inserted into the shim stack until ______ consecutive liftoff/lock-off readings have been taken.
 - a) Two (2) b) Three (3) c) Four (4)
- 15) Steel rulers are calibrated every:
 - a) 6 months (6) 1 year ± 0,01" c) 5 years
- 16) When should Quality Control Documents be signed by the inspector?
 - a) Before the next step
 - b) At the end of the day
 - (C) After all information for the inspections have been entered
- 17) Who controls the Measuring and Test Equipment used by PSC Inspectors?
 - a) PSC Superintendent
 - b) Utility employees
 - © PSC Quality Control or Quality Assurance personnel
- 18) Where are all quality related documents pertaining to the project kept?
 - a) In the inspector's desk
 - (b) Field office file or jobsite vault
 - c) With the PSC Superintendent
- 19) All Lead Field Quality Control Inspectors shall be qualified to a minimum of Level ______ capability in accordance with the requirements of ANSI N45.2.6.
 - a) [6)[] c) []]

20) In the event of conflict between any TMI procedure and an SQ procedure, which governs?

a) The SQ Procedure (b) The TMI Procedure Owner c) Neither

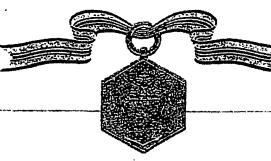
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ANGLO DU DENCINS DU ME In recognition of the successful completion of the requisite course of study and on momination of the Faculty of the University Callege by virtue of authority granted by charter of the State of Maryland hereby confers upon Romb Albert Derry the degree of Budgler of Science with all the honors, rights, and privileges therewate appertaining. An witness where fithis Diploma, signed by the authorized officers withe University and seafed with the corporate seal of the University is granted. Given at College Park on the thirtieth day of August in the year nineteen hundred eighty one. When F O Malley airman Boord of Registra John A. Fll Gresident Maryfyfen Leen Peck By Marry Chancellor

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DEPARTMENT OF THE AIR FORCE

THIS IS TO CERTIFY THAT

THE AIR FORCE COMMENDATION MEDAL

HAS BEEN AWARDED TO

STAFF SERGEANT RONALD A. PERRY

FOR

MERITORIOUS SERVICE 26 AUGUST 1973 - 20 APRIL 1977

GIVEN UNDER MY HAND IN THE CITY OF WASHINGTON THIS 5TH DAY OF APRIL 19 77

LIEUTENANT GENERAL, USAF COMMANDER



SECRETARY

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AF FORM 2224, JUL 70

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RTL A5.611A



Certificate of Duquesne Light Qualification

Name									
	RONALD A			•	297				
QSP 2. Examir	dividual is certil 12, Rev. 0, "W nation Personne ass CC Concre	ritten Practio el for Class I	ce for Qu MC and I	alification Metallic L	n and Ce .iners of	rtificati Class (ion of Visua CC Compo	al nents	
·	<u></u>		Examinat	on Result			·····		
Date	7-18-1990*	Basic Exar					Grade	92	
Date	7-27-1992 *	Method Ex	aminatio	n			Grade	81	
Date	2-2-1999	Specific	93	1	····	····	l		
Date	2-2-1999	Practical	93	Averag	e	93	Grade	93	
				-			Average	88.66	
		17-1999	-: <u>-</u>		Certificati	-	ition Date 2-17-04		
	ntification in this Me	YES			Recertific	ation in t	his Method NO		
Eye Exa	mination date at tim	e of certification		-1998					
*Credi QSP 2 IWE/IV (Level	ons/Limitations t for the Basic E .12 paragraph 3 VL training was II) examination I (attached).	.4.2 (H) (1) (: provided by	2) (3). / EPRI on	2/1-2/2,	1999. Ge	neral, S	Specific and	l Practica	
Respon	sible Engineer, PE /	Date 7E-024749	E/2-18-9		pervisor/D	<u> </u>	2/18/94	3	

RTL A5.811A



Certificate of Qualification

Name	Bonald A	Borni	Employee		Social Security #				
This inc	Ronald A		dancowi		297	Company Bree	odure		
This individual is certified in accordance with Duquesne Light Company Procedure QSP 2.3, Rev. 5, "Written Practice for Qualification and Certification of									
	tructive Exami								
	ations in the fo				• •				
TESTIN		noming oap					••		

Date	08/19/92*	Basic Exar	Examination	on Kesul		Crodot	07 20%		
Date	09/04/97	Method Exam		~		Grade* Grade	97.30%		
Date	09/04/97		94.6%	<u>n</u>		Grade	89.23%		
Date	09/04/97	Specific Practical	100%	Averag	e 97.3	3 Grade	97.30%		
Date				riterag	0 1 01.4	Average	4		
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Certificati	na Data				Codification	Expiration Date			
Continedit		/05/1997			09/05/2002				
Initial Cer	tilication in this Ma				Recertificatio	n in this Method			
		No				Yes			
Eye Exan	nination date at tim	e of certification		5/96					
Restrictio	ns/Limitations		512	0190					
None									
	Basic Examina	ation still vali	id in acco	rdance v	vith Code C	ase N-489 an	d QSP		
2.3, Re	vision 5								
NDE Lev	et III/Date			T					
Turnetly & Hermel L-TH 9-5-97 NDE Supervisor/Date Manager, Quality Services / Date									
NDE Sup	ervisor/Date			-	, Quality Servi				
	Alecondi 9/5/97 K.C. Ostrawale / 9/5/97								
f									

RTL A5.611A



Certificate of Qualification

Name	<u> </u>			Employee # Soc			iocial Security #			
	Ronald A		_		297					
QSP 2.3 Nondes	This individual is certified in accordance with Duquesne Light Company Procedure QSP 2.3, Rev. 5, "Written Practice for Qualification and Certification of Nondestructive Examination and Testing Personnel", and is qualified to perform examinations in the following capacity: NDE Level III in LIQUID PENETRANT									
TESTIN	TESTING									
			Examinati	on Resul	s					
Date	08/19/92*	Basic Exar	nination				Grade*	97.30%		
Date	09/04/97	Method Ex	aminatio	n			Grade	89.23%		
Date	07/29/97	Specific	94.6%					•• ••••••••••••••••••		
Date	09/04/97	Practical	100%	Averag	e	97.3	Grade	97.30%		
							Average	94.6%		
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Certificati	on Date				Certifica	tion Expir	ation Date			
		9/05/1997				09	05/2002			
Initial Cer	tilication in this Me	nthod No			Recertif	ication in I	this Method Yes			
Eye Exar	nination date at tin	ne of certification		5/96	L					
Restrictio	ns/Limitations		312							
None										
	Basic Examina	ation still val	ia in acco	raance v	with Co	de Case	e N-489 and	IQSP		
2.3, Re	evision 5									
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Juni	Ely & Hum	LI.II	9-5-97							
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Certificate of Duquesne Light Qualification

Name		Employee #		Social Security #							
Rona	d A. Perry	429	7								
This individual is certified in accordance with Duquesne Light Company Procedure											
QSP 2.3, Rev. 4, "Written Practice for Qualification and Certification of											
Nondestruc	Nondestructive Examination and Testing Personnel", and is qualified to perform										
examinations using the following NDE method: Level II Ultrasonic Limited*											
		EuropetinoAla	na Denulta								
Date	Examination Results Date General Score (Gg) Weight (Wg) Score										
		**dig									
1-18-96	93.3		.3	28							
Date 1-16-96	Specific Score (Gs) 100	AAR	ht (VVs) .3	Score 30							
Date	Practical Score (Gp)	Weig	iht (Wp)	Score							
1-25-96	92		.4	36.8							
				Camposite Grade (GC) 94.8							
Certification Date			Certification E	veletine Data							
Companion Date	1-25-96		veruncanen e	1-25-99							
Initial Certification			Recertification	in this Method							
	<u>NO</u>			YES							
Eye Examination	date at time of certification		3 05								
Reefelene	-11	5-23	9-95								
Restrictions/Limitations *Limited to ultrasonic thickness measurements using straight beam transducers in combination with digital readout UT instruments (Krautkramer DME, DM Scope and Panametrics 5222).											
Level III Signatur		e Hem	l Late	1-25-96							

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NDE CERTIFICATION

This is to certify that <u>Ronald A. Perry</u> is qualified to perform <u>visual</u> examinations.

Satisfactory training has been completed in accordance with A4.2 (Written Practice for Qualification and Certification of Nondestructive Examination and Testing Personnel).

Level of Certification	:	III
Date of Certification	:	8/6/90
Expiration Date	:	8/5/95

Summary of Qualifications

Examination Results:

Basic	92	Percentile Weight	:	(.3)	27.6
Method	81	Percentile Weight	:	(.3)	24.3
Specific	91	Percentile Weight	:	(.4)	36.4
		Composite Score	:		88.3

Eye Examination Expiration Date: 8/23/90

Certified By: 1/2 Justur-Vice President, Nuclear Group ____ Date <u>8-7-90</u>

CERTIFICATE OF RETRAINING

Awarded By

ELECTRIC POWER RESEARCH INSTITUTE NONDESTRUCTIVE EVALUATION CENTER 1300 Harris Blvd. • P. O. Box 217097 CHARLOTTE, NC 28221



<u>Ronald Perry</u>

Participated in the Retraining of the Course

Visual Examination Technology 103

July 23-27, 1990

and is therefore entitled to this certificate of classroom retraining as approved by the EPRI NDE Center (Examination scores and details of course content available from the EPRI NDE Center)



EPRI NDE Center

(Sponsoring Organization)

g<u>ehene h</u>. Henn Henry M. Stephens, Jr.

Training Manager



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CONTINUING EDUCATION UNITS

Awarded By

ELECTRIC POWER RESEARCH INSTITUTE NONDESTRUCTIVE EVALUATION CENTER 1300 Harris Blvd. • P. O. Box 217097 CHARLOTTE, NC 28221



<u>Ronald Perry</u>

Attended the Continuing Education Course

Level III Basic Course

July 16-18, 1990

2.0

CEUs Awarded

and is therefore entitled to this certificate of classroom training as approved by the EPRI NDE Center (Examination scores and details of course content available from the EPRI NDE Center)



Presented By

EPRINDE Center

(Sponsoring Organization)

alune h Henne Alenry M. Stephens, Jr. Training Manager



Performance Documentation Summary EPRI NDE Center

Name: Ronald A. Perry

Visual Examination Technology 102 IWE/IWL Level II Visual Examination

Date: February 2, 1999

Type of Visual Examination '	Number of Reportable Indications	Number of Indications Found [®]	Points (20 Points Each Section) 80 Points Total
Bolting	2	2	. 17
Coated Surfaces	1	1	i9 ·
Concrete	3	3	19
Weldment	2	2	19
*This practical examination required that you identify 80% of the conditions listed above. Failure to record 80% of the known indications will result in failure regardless of composite practical examination score.		Percent of Indications	Percent of Composite Practical
		Fourid: 100 %	Score 93 %

This information is provided for informational purposes only. Official scores are only recorded on the transcript supplied by the EPRI NDE Center, 1300 Harris Blvd., Charlotte, NC 23262 -704/547-6110

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forms/ve2d-pds.doc

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CERTIFICATE OF RETRAINING

Awarded By



1300 Harris Blvd. • P.O. Box 217097 CHARLOTTE, NC 28221

Ronald A. Perry

Attended the Continuing Education Course

Visual Examination - Level III

July 24-28, 2000

and is therefore entitled to this certificate of classroom training as approved by the EPRI NDE Center (Examination scores and details of coarse content available from the EPRI NDE Center)

Presented By

(Sponsoring Organization)

Henry

EPP

Henry M. Stephens, Jr. Manager, NDE Training

Michael allersien

Michael Allgaid Course Director

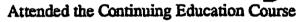
CONTINUING EDUCATION UNITS

Awarded By

ELECTRIC POWER RESEARCH INSTITUTE NONDESTRUCTIVE EVALUATION CENTER 1300 Harris Blvd. • P. O. Box 217097 CHARLOTTE, NC 28221

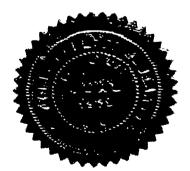


<u>Ronald Perry</u>



NDE Instructor Training

June 7-11, 1993



and is therefore entitled to this certificate of classroom training as approved by the EPRI NDE Center (Examination scores and details of course context svailable from the EPRI NDE Center)

> 4.0 CEUs Awarded

Presented By

EPRINDE Center

(Sponsoring Organization)

Henry M. Stephens, Jr.

Henry M. Stephens, Jr. Training Manager

NUMBER Shaw AREVA ELISI ZARRICATION FACTIST THIS IS TO CERTIFY THAT Ronald Perry IS HEREBY QUALIFIED AS A Lead Auditor This certification is based on an evaluation of employee qualifications in accordance with ANSI/ASME-NQA-1. The employee's education, experience, training, and ability have been evaluated and summarized on a qualification form. This form and records to substantiate qualifications are on file in the MOX Services Project Record Center. MAR 09 MOX Services Quality Assurance Manager Date AMONTAN. JAMEENS,



Record of Lead Auditor Qualification

IAME:	Ronald A. Perry		DATE: 20	0 Nov. 09
UALIF	ICATION POINT REQ	UIREMENTS		CREDITS
	GRADUATE	DATE UNIV. of MARYLAND, MD I	981 4 CREDITS MAX	2
TECHN NUCLE QUALT AUDIT	ENCE: COMPANY / DATES ICAL (0-5 CREDITS) and 16 YEAI AR INDUSTRY (1 CREDIT), or TY ASSURANCE (2 CREDITS), or ING (3 CREDITS) AR QUALITY ASSURANCE (3 CR		9CREDITS MAX	5
. NUCLE	AR QUALITY ASSURANCE AUDIT	HMENT: CERTIFICATE / DATE	2 CREDITS MAX	4
MANAC	GEMENT: JUSTIFICATION/E		2 CREDITS MAX	
		WALLOWTOR ? DATE	2 CREDITS MAX	
MINIMUM	CREDITS REQUIRED 10)		TOTAL CREDITS	11
MINIMUM AUDIT AUDIT	CREDITS REQUIRED 10) COMMUNICATION SE TRAINING COURSES	CILLS EVALUATED BY:	TOTAL CREDITS	TE
MINIMUM AUDIT I. J-E-T-S 2. AUDIT I. SAVAN 2. SAVAM 3. CLEVEL 4. CLEVEL	CREDITS REQUIRED 10) COMMUNICATION SE TRAINING COURSES 5, INC. PARTICIPATION: LOCATION VAH RIVER SITE AND, OH	COURSE TITLE AND TOPIC	TOTAL CREDITS DATE COMPLE S NOV. 199	NED . 09 . 08 T. 08 T. 08
MINIMUM AUDIT AUDIT J. J-E-T-S 2. AUDIT I. SAVANP 2. SAVANP 3. CLEVEL 4. CLEVEL 4. CLEVEL 5. ARNPRI EXAMI	CREDITS REQUIRED 10) COMMUNICATION SE TRAINING COURSES S, INC. PARTICIPATION: LOCATION VAH RIVER SITE AND, OH AND, OH OR, ON CANADA NATION:	COURSE TITLE AND TOPIC LEADING EFFECTIVE ASSESSMENT: AUDIT (PROJECT / ACTIVITY DCS-08-A01 DCS-08-A10 BASE-08-VE118 ERICO-08-VE119	DATE COMPLE S NOV. 199 DATE PERFOR 13 OCT 23 SEP 16 SEP	NED . 09 . 08 T. 08 T. 08
MINIMUM AUDIT AUDIT I. J-E-T-S 2. AUDIT I. SAVANP 2. SAVANP 3. CLEVEL 4. CLEVEL 5. ARNPRI EXAMI TYPE: C AUDITO SIGNATUR ANNU	CREDITS REQUIRED 10) COMMUNICATION SE TRAINING COURSES 5, INC. PARTICIPATION: LOCATION VAH RIVER SITE AND, OH AND, OH OR, ON CANADA NATION: DRAL SC OR CERTIFIED BY:	COURSE TITLE AND TOPIC LEADING EFFECTIVE ASSESSMENT: AUDIT (PROJECT / ACTIVITY DCS-08-A01 DCS-08-A01 DCS-08-VE118 ERICO-08-VE119 NUT-09-VE03	TOTAL CREDITS DATE COMPLE S NOV. 195 DATE PERFOR 25 FEB 13 OCT 22 SEP 16 SEP 27 JAN	NED . 09 . 08 T. 08 T. 08

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WELDING SERVICES, INC. **CERTIFICATE OF QUALIFICATION**

We hereby certify that EMPLOYEE SSN: Ronald A. Perry is qualified to perform the duties and assume responsibility of Visual Weld and Mechanical Inspection LEVEL II Effective: 08-24-2007 to 08-24-2010

> THIS CERTIFICATION IS BASED ON THE FOLLOWING, AS CHECKED _ RECORD OF EDUCATION, EXPERIENCE AND TRAINING 1. <u>X</u> 2. **QUALIFICATION EXAMINATIONS**

SECTION	GRADE
GENERAL	89.7
SPECIFIC	92.0
PRACTICAL	94.0
COMPOSITE GRADE	91.9

The above-named individual has satisfactorily completed training requirements of WSI QAP 2.7, Rev.13. Supporting documents are maintained by WSI and may be examined by Authorized Client, Regulatory and Insurance Company representatives.

EXPERIENCE: US Air Force: 1969-1979, NDE Specialist with experience in PT. MT. RT. UT. ET. and VT including and Quality Control. OE Nuclear: Currently Certified Level II PT. MT. VT-1 and VT-2. Over 30 years experience in NDE and Quality control functions with extensive NOE Experience in the Nuclear Power Industry. TRAINING: 80 Hours Visual Inspection, Level II and III, USAP. 4 Hours refresher training. WSI. 7/2007.

BDUCATION: HS Diploma, University of Maryland, flachelor of Science Degree, August, 1981. THIS CERTIFICATION MEETS: ASNT/CP-189-95", ASME B&PV Code Sect. XI.Dix.1, IWA-2300, and SNT-TC-1A

R. cimentall, NDE Level III B. Greene, V.P., Quality Assurance

08/24/2007 DATE 9/13/07 DATE

VISION EXAMINATION DATES AND RESULTS

EXAMINATION DATE	DUE DATE	RESULTS	EXAMINER
08/24/2007	08/23/2008	Satisfactory	R.R. Leimenstoll, NDE Level III

RESULTS OF PERIODIC EVALUATION

DATE	RESULTS	INSPECTION ACTIVITIES	EVALUATOR
L		L	



MOX SERVICES CERTIFICATE OF QUALIFICATION ANSI N45.2.6/NQA-1 – QUALITY

WE HEREBY CERTIFY THAT EMPLOYEE ______ IS Nume

QUALIFIED TO PERFORM THE DUTIES AND ASSUME THE RESPONSIBILITIES FOR INSPECTIONS AND TESTS IN THE FOLLOWING ACTIVITIES/TASKS WITHIN THE QUALITY DISCIPLINE:

LEVEL		ACTIVITY/TASK	CERTIFICATION BASIS		ICTIONS emarks)
		435 M&TE Equipment		DYES	ONC
II	\boxtimes	445 Receipt Inspection/Preventative Maintenance	1, 2 and 3	DYES	ØNO
		460 Shop Inspection		DYES	
		461 Mechanical *		DYES	
		462 Electrical *		DYES	
		463 Civil/Structural *		DYES	
		464 Welding *		OYES	OND
		470 ANSI Level III Designee		DYES	
• Project	Speci	fic Certification when required			

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EFFECTIVE PERIOD OF CERTIFICATION: FROM 28 Jul 19 To 28 Jul 12

THIS CERTIFICATION IS BASED UPON SATISFACTORY COMPLETION OF THE REQUIREMENTS OF PP 3-2?, REVISION IN EFFECT AT THE TIME OF CERTIFICATION. THE BASIS FOR CERTIFICATION IS:

1. RECORD OF EXPERIENCE, EDUCATION, AND TRAINING

2. WRITTEN OR ORAL EXAMINATION

3. PROFICIENCY DEMONSTRATION (PRACTICAL EXAMINATION)

SUPPORTING DOCUMENTS ARE MAINTAINED BY QUALITY ASSURANCE AND MAY BE EXAMINED ... AUTHORIZED CLIENT, REGULATORY AND INSURANCE COMPANY REPRESENTATIVES.

Signed: Discipline Le GLAN	<u>22 Jul 09</u>
Signed:Quelley Clubelly Quelley Department Management	ZB JUL09 Date
Quary bepartment management	U414

REMARKS AND RESTRICTION DETAILS:

PP3-27E Revision 1

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•		AND CEMENT SOCIATION		
	5420 Old Orchard	Road, Skokle, Illino	is 60076	
Recon	mendation	1 for C to certify that		C redit
	Ronald #	Albert Perry	r	
	has successfully comp which is recommended American Com	ed for college	credit by the	
	Course LEVEL I INSP	PECTION TECH	INICIAN	
	Credits			
	DateJune_	<u>13, 1981</u>		
	Credits Date Records and transcr are available and with Council on Education llegiate Sponsored Instruction Dupont Circle gton, D.C. 20036	ipts of exami ill be issued 1	nation grades ipon request.	
	AD	64	Authorized by	in la 1
American (Program on Noncol	Council on Education	Edu	mind X. Kal	

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CERTIFICATE ACHIEVEMENT

Ronald Albert Perry

has completed the 5-day course

Level I Inspection Technician (Nuclear)

conducted by the Portland Cement Association in accordance with Appendix VII, ASME Section III, Division 2, Code for Concrete Reactor Vessels and Containments, covering the Reinforcing Material Technician and Concrete Material Technician as described by Appendix E of the Code and has successfully passed the examination and performance demonstration. In recognition of that accomplishment, this Certificate of Achievement is awarded this _______ day of _________ day of

Vilan

LEVEL III INSPECTION ENGINEER

R. E. Leun

PORTLAND CEMENT ASSOCIATION

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Nuclear Quality Assessment

EMPLOYEE IDENTIFICATION	LEAD AUDITO	OR CERTIFICAT	ION RECORD
NAME	SOCIAL SECURITY NUMBER	EMPLOYEE NUMBER	
Rogald A. Perry		4297	
QUALIFICATION REQUIREMENTS (RESUME ON FILE - 1	nitial DCA Date 1-4-01)		
EDUCATION (4 POINTS MAXIMUM)			
UNDERORADUATE SCHOOL	DEOREE	DATE	POINTS
University of Maryland	B. S. Business Management	8/30/81	
UNDERGRADUATE SCHOOL	DEOREE	DATE	2
ORADUATE SCHOOL	DEGREB	DATE	POINTS
GRADUATE SCHOOL	DEOREE	DATE	

EXPERIENCE (9 POINTS MAXIMUM)			
INDUSTRY (5 POINTS MAXIMUM) AND	COMPANY Commonwealth Edison	DATES 7/80 TO 8/81	POINTS
NUCLEAR INDUSTRY (NI) – 1 POINT OR	Duquesae Light Company and FENOC	5/83 TO Present	5
QUALITY ASSURANCE (QA) - 2 POINTS OR	COMPANY Duqueme Light Company (Auditing 1/28/94 TO	DATES	POINTS
AUDITING (AU) - 2 POINTS OR	1/29/94) Duquesno Light Company (Auditing 2/14/96 TO	DATES	POINTS
NUCLEAR QA (NQA) - 3 FOINTS OR	4/23/96) Duquesne Light Company / FENOC (Auditing 5/99 TO	DATES	POINTS
COMBINED NQA, AU - 4 POINTS	Present)	DATES 1/94 TO Present	POINTS 4

PROFESSIONAL ACCOMPLISHMENT (2 POINTS MAXIMUM)					
PROFESSIONAL ENGINEER			DATB	POINTS	
SOCIETY	DATE	SOCIETY	DATE	POINTS	

MANAGEMENT JUSTIFICATION (2 POINTS MAXIMUM)	
EXPLANATION Mr. Perry has successfully completed the Lead Auditor Qualification Examination and has demonstrated the ability to	POINTS
effectively conduct quality assurance audits.	2
TOTAL POINTS	
	13

VERBAL & EVALUATED BY TITLE DATE	
WRITTEN X M.a. Mga Supv. NQA 1-4-01	ате 1-4-01

AUDIT TRAINING COURSES	
COURSE TITLE ON TOPIC	DATE
Audit Training • Commonwealth Edison (81/rs)	8/1/80
COURSE TITLE OR TOPIC	DATE
Leading Effective Assessments - J-E-T-S, Inc (16Hrs)	11/8/95

AUDIT PARTICIPATION		
LOCATION	AUDIT	DATE
Beaver Valley Power Station	BV-C-99-06 Measuring and Test Equipment Pro	gram 5710-6/25/99
LOCATION	AUDIT	DATE
Beaver Valley Power Station	BV-C-99-13 QC/NDE Programs	7/16-8/13/99
LOCATION	AUDIT	DATE
Beaver Valley Power Station	BV-C-99-12 Environmental Hogram	9/8-10/27/99
LOCATION	AUDIT	DATE
Beaver Valley Power Station	BV-C-99-15 Training	10/26 - 12/21/99
LOCATION	AUDIT	DATE
Beaver Valley Power Station	BV-C-00-01 Security and Access Authorization	1/31-3/15/2000

CERTIFICATION AS A			
EXAMINATION DATE	CERTIFIED BY (STONATURE)	TITLE MAMAGER NQA	DATE
11/8/95	M. u. Teyen	Manager, NQA	1-7-01

FirstEnergy Nuclear Operating Company EMPLOYEE BIOGRAPHICAL DATA

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I. BASIC INF	ORMATION .
1. NAME	2. SOCIAL SECURITY NO.
Ronald A. Perry	
Senior QA Specialist	4. DEPARTMENT
5. COMPANY LOCATION	Quality Services Audit and Surveillances
Beaver Valley	
5. INDICATE THE DEGREES YOU HAVE EARNED (CHECK ALL THAT APPLY) AND T	he degree type.
High School or Equivalent. Major: Falmouth HS, Fal Associate's Degree. Major:	mouth, ME College
Bachelor's Degree. Major: Bachelor of Science Busin	ess Management, University of Maryland 1981
Master's Degree. Major:	
Doctorate. Major:	
7. LIST PROFESSIONAL CERTIFICATIONS, LICENSES, OR MEMBERSHIPS YOU HO	DLO.
NDE Level III - Visual Examination method (VT). This includes	a 1C and 3C per ASME XI IWE/IWL
NDE Level III - Penetrant Examination method (PT)	
NDE Level III - Magnetic Particle Examination method (MT)	
NDE Level IIL - Ultrasonic Examination method (UT)	
8. LIST ANY SPECIAL TRAINING AND/OR EDUCATION YOU HAVE RECEIVED.	
EPRI VT Level II training for ASME XI IWE/IWL (Visual exam	ination of Containment) - Feb. 1999
EPP Training 1998-1999	
Thermal Infrared Testing - Level I - Infrared Education Center	(40 hours) las 1997
Lead Auditor Training - 1996	(40 10015) 341. 1841
Dale Carnegie Course - Jan. 1996	
EPRI Level III Visual Examination Training - 1990 and 1995	
NDE Instructor Training - EPRI NDE Center (40 hours) June,	1993
ISI of Nuclear Plant Components - Technical Seminars (21 ho	
Systematic Approach to Training (SAP) for Instructor - DLCo -	
II. SKILLS AND WO 9. UST YOUR CURRENT AND PREVIOUS WORK EXPERIENCE, BEGINNING WITH COMPANY, DEPARTMENT AND MAJOR RESPONSIBILITIES/ASSIGNMENTS. AL	
May 16 to Present - SR QA Specialist, DLCo., QSAS	
Perform Audits and Surveillances of BVPS site groups as dire	cted by QSAS Supervisor.
Participate on Blue Team EPP in the capacity of Information (Coordinator
May 16, 1983 to May 16, 1999 - NDE Specialist/ NDE Super	rvisor
Perform and direct NDE examinations at BVPS. MaIntain NDI	E Level II and III certifications as noted above.
Responsible for establishing a training program for the certific	ation of NDE personnel. Prepare and implement training
programs in support of qualification and certification of site pe	rsonnel.
Review and acceptance of NDE reports, interpret examination	results, and prepare Condition Reports for unsat conditions.
Maintain familiarity with ASME Codes.	-
Prepare 90 Day Summary Report,	
Assist in the development and implementation of an ASME X	IWE/IWL Program.
Prepare and implement NDE procedures.	• • •

II. Skills and Work Experience - Continued	
9. Continued Provide NDE training to contractor personnel performing examinations at BVPS.	
III. MAJOR ACCOMPLISHMENTS	
Maintain Level III certifications. Perform the majority of NDE training and certification at BVPS.	
Developed and implemented technical and administrative procedures for the ISI department	
Participated on various working groups on the ASME XI Code Commendation Medal while serving in the United States Air Force 1976	
Maintenance Supervisor for over 300 aircraft maintenance personnel at Loring AFB, ME	
IV. OTHER	S 8 8 2
Familiar with ASME Code as well as site administrative procedures. Continually upgrade myself by voluntee services and expertise.	
CERTIFY THAT THE INFORMATION GIVEN ON THIS DOCUMENT IS ACCURATE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.	
Employee Signature Date	
	·····

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IWL VISUAL EXAMINER CERTIFICATION RECORD (EXHIBIT A)

Document:	
Revision:	
Date:	
Document Type:	Cor
Page:	

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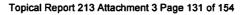
July 16, 2013

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FRM-POR-001

IWL GENERAL AND DETAILED VISUAL EXAMINER CERTIFICATION RECORD

Training Requirements		Initials(Examinee/Instructor)	Date	
Training in Section XI, Subsection IWL (4 hours mir	Rap / CEC	10/18/13		
Training shall include requirements for inservice and preservice examinations and reporting criteria for the following:(2 hours minimum)				
1) Concrete (conditions such as those described in ACI-2	201.1)	RAP / CEC	10/18/13	
2) Reinforcing steel		RAP / CEC	10/18/13	
 Post-tensioning system items (e.g., wires, strands, and hardware, corrosion protection medium, and free wate 		Rap / CEC	10/18/13	
Written Examination		Grade	Date	
Written examination covering Section XI, Subsection IWL re plant-specific procedure requirements for visual examination of 15 questions in the following:				
1) Concrete and Reinforcing Steel		86.6%	10/18/13	
 Post-tensioning system components(i.e., wires, strand hardware, corrosion protection medium, and free wate 		86.6%	10/18/13	
Practical Examination		Grade	Date	
A practical examination using test specimens with flaws or in detected by the following visual examination techn				
1) General and detailed visual examination of concrete		93%	10/18/13	
2) Detailed visual examination of reinforcing steel		93%	10/18/13	
 Detailed visual examination of post-tensioning system components (i.e., wires, strands, and anchorage hardware) 		95%	10/18/13	
Passing grades for visual examinations shall be as follows:		Final Grade	Date	
An average combined grade of 80% for written and practical examinations		90.8%	10/18/13	
A minimum grade of 70% for each written and practica	al examination			
Precision Surveillance Corporation certifies that the following individual meets the minimum qualifications set forth in the Corporation Standard Document STD-PQR-001 "Personnel Qualification Requirements for General and Detailed Visual Examinations for Nuclear Power Plants".				
IWL Visual Examiner (Print Name):	Ronald A. Per	ſŷ		
IWL Visual Examiner (Signature):	Phal	2 a Pay		
SS #(Last Four Digils)				
Certification Date:	10/18/13			
Certification Expiration Date: 10/17/18				
P.S.C. Professional Engineer Approval(Name)	rofessional Engineer Approval(Name) Christopher E. Com			
P.S.C. Professional Engineer Approval(Signature)	Chiller	Ciff		
	/			





IWL VISUAL EXAMINER RECORD OF EXPERIENCE (EXHIBIT F)

Document:	FRM-PQR-006
Revision:	0
Date:	July 16, 2013
Document Type:	Corporation Standards
Page:	1 d 2

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IWL VISUAL EXAMINER RECORD OF EXPERIENCE

		Name		Electronic Signature	SS (last four		Verific	xperience ation Date /dd/yyyy
IWL Visual	Examiner	Ronald Perry		Roman Por			10/1	8/2013
best of my Examinatio	gning the ab knowledge. n, requireme	The work experie ants set forth by A	te that the for nce may be SME, Section	the same or similar on XI, Subsection I t are applicable to	ar to the Geni WL.	eral and D		
Nuclear Power Plants	Visual Examination	Repair/Replacement	Modification(s)	Periodic Test(s)	Manufacturing, Construction, Fabrication or Installation	Visual Examinations		Dimensional Vertifications
Ocone e 2007 WSI	Level II Mechanical, VT,PT,MT						Ve	mensional critication of seves
Calawba 2007 WSI	Level II Mechanical, VT,PT,MT							
Merc Plant Pharmaceutic 2008	Level II J VT of Tank	8						
Limerick 2008	Levei II VT,PT,MT							





IWL VISUAL EXAMINER RECORD OF EXPERIENCE (EXHIBIT F)

Document:
Revision :
Datas

Date:	

Document Type: Page: Corporation Standards

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FRM-PQR-006

July 16, 2013

1 of 2

	(ADDITIONAL SHEET
2	ADDED FOR WORK
	EXPERIENCE)

IWL VISUAL EXAMINER RECORD OF EXPERIENCE

		Name		Electronic Signature	SS (last four		Work Experience Verification Date mm/dd/yyyy
IWL Visua	l Examiner	Ronald Perry	F	2 a PATA			10/18/2013
Note: By si best of my Examination	knowledge.	Christopher E. Co ove, I acknowledg The work experies ants set forth by As ith the dates(mm/c	e that the foil nce may be th SME, Section	ne same or similar XI, Subsection IV	r to the Gene VL.	eral and De	tailed Visual
Nuclear Power Plants	Visual Examination	Repair/Replacement	Modification(s)	Periodic Test(s)	Manufacturing. Construction.Fabrication or Installation	Visual Examinations	Dimensional Verifications
Nine Mile Point 2005	Level II VT,PT.MT						
First Energy 1986-2005	Level III VT,PT,MT						



IWL VISUAL EXAMINER RECORD C	F
EXPERIENCE	
(EXHIBIT F)	

Document:	FRM-POR-008
Revision:	0
Date:	July 16, 2013
Document Type:	Corporation Standards
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Please initial the following section that is most applicable to your level of education and experience.

____ I am a high school graduate or have an equivalent degree with a minimum of oneyear experience in IWL related or similar activities.

_____ I am a high school graduate or have an equivalent degree with a completed twoyear associates degree in the construction or science field and a minimum of 6 months experience in IWL related or similar activities.

 \underline{x} I am a high school graduate or have an equivalent degree with a completed fouryear bachelor's degree in the construction or science field and a minimum of 3 months experience in IWL related or similar activities.

Please fill in the Work Experience Form as thorough as possible. Dates should be noted as month/day/year(mm/dd/yyyy).

		Work Experience Form	
Company:		Responsibilities:	
Welding S	Services Incorporated	Perform ISI examination as a Level II in PT, MT& VT	
	Location:		
Oconee/	Calawba		
From:	08/2007		
To:	11/2007		
	Company:	Responsibilities:	
Tourgee l	& Associates	Perform examination of tanks and peripheral equipment as a VT Level II	
	Location:		
Merc Pla	nt in Danville, PA		
From:	9/11/08		
To:	11/11/06		······································
	Company:	Responsibilities:	
Sonic Sy	stems international	ISI Coordinator-Level II VT, MT, PT	
Location:			
Limerick			
From:	02/2006		
To:	03/2006		

		Document:	FRM-PQR-006
	IWL VISUAL EXAMINER RECORD OF EXPERIENCE (EXHIBIT F)	Revision:	0
		Date:	July 16, 2013
THE PROVIDE AND TANKE		Document Type:	Corporation Standards
		Page:	2 of 2

(ADDITIONAL SHEET ADDED FOR WORK EXPERIENCE)

Please initial the following section that is most applicable to your level of education and experience.

____ I am a high school graduate or have an equivalent degree with a minimum of oneyear experience in IWL related or similar activities.

_____ I am a high school graduate or have an equivalent degree with a completed twoyear associates degree in the construction or science field and a minimum of 6 months experience in IWL related or similar activities.

 \underline{x} I am a high school graduate or have an equivalent degree with a completed fouryear bachelor's degree in the construction or science field and a minimum of 3 months experience in IWL related or similar activities.

Please fill in the Work Experience Form as thorough as possible. Dates should be noted as month/day/year(mm/dd/yyyy).

		Work Experience Form
	Company:	Responsibilities:
Sonic Sys	stems International	Perform ISI examination as a Level II in PT, MT & VT
	Location:	·
Nine Mile	Point	
From:	03/2005	
To:	04/2005	
		Paga ang ikiliting
	Company:	Responsibilities:
First Ener	rgy/Duquesne Ligth	QA Audilor, NDE Specialist; NDE Supervisor-Supervised the development and implementation
	Location:	of a NDE ISI Department. Developed NDE related and administrative procedures. Level III in
Beaver V	'alley, Davis Besse	PT, MT and VT. Level II in UT. As a QA Lead Audilor performed assessment of maintenance,
		licensing, engineering, construction, radiation protection, operations, document control/records
From:	05/16/1983	management; M&TE Program-prepare audit reports and initiate deficiency reports as regid.
To:	02/15/2005	
		Responsibilities:
	Company:	
	Location:	
Limerick		
	T	
From:	<u> </u>	
To:		

	IWL-2000	Document:	EXM-PQR-00
psc/	WRITTEN EXAMINATION	Revision:	
PREDIDINA	CONCRETE & REINFORCING STEEL	Date:	July 16, 201:
		Document Type: Page:	Corporation Standard
NAME: <u>Ronald</u> Social security num		10/18/13 1-0-	
administration that could o	ved nor observed any aid or information regardin compromise this exam's integrity. I also understator, during, or subsequent to the exam administration	g this exam prior to o nd my obligation to re	-
examination and that I ha ensure my understanding I have read and understa	Pa	Py 1	o/18/13
a an	FILL IN ONE CIRCLE AS THE ANSWER FOR I	EACH QUESTION	analanna ku a na a dangar mununa ha (dudagan
1 1 2 1 3 1 4 1 5 1	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	A B C D 11 O O O O 12 O O O O 13 O O O O 14 O O O O 15 O O O O	
	Topical Report 213 Attachment 3 Page 136 of		EXM-PQR-001

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	_	IWL-2000	Document:	EXM-PQR-001
		WRITTEN EXAMINATION	Revision:	0
			Date:	July 16, 2013
Chat Eligin	n, Carlon (LLAnn; C	CONCRETE & REINFORCING STEEL	Document Type:	Corporation Standards
	;		Page:	2 of 3
1.	What is the function	n of the ANII?		
	b) To provide andc) To ensure nucl	lance with NRC regulations ther approval signature on forms ear safety llance with applicable requirements of the ASME	Code	
2.	General Visual insp	pections are required to be performed on:		
	 (a) Exterior Contai (b) Tendon button (c) Jacks/Rams us (d) All of the above 	ed for stressing		
3.	What is the charact	ter height of the lower case letters for Detailed Vi	sual Inspections?	
	a) 0.010" b) 0.105" (C) 0.044" 8) 0.500"			
4.		s defined by the breaking away of small portions hich leaves a shallow, typically conical depression		e due to localized
	a) Exudation b) Laitance C) Popout d) Encrustation			
5.	What is an optical			
ź	A device to evi	aluate vision lasure surface lighting intensity	ize of letters	>
6.	Efflorescence is a	sign of		
	 Mineral leachir b) Concrete addit c) Nothing d) Surface coatin 	lives		
7.	Who may perform	IWL Visual examinations without certification?		
	a) QC Personnel b) Level II ISI per c) A manager or d None of the at	sonnel supervisor of ISI programs		
8.	Per ASME Section	XI, subsection IWL what are to be given a gener	al visual examinatio	n?
	b) The tendon ga	Des craft personnel are wearing Illery ceiling endon strand wedges or wire button heads of hard hats worn by personnel		
L				

EXM-POR-001 R0

•	IWL-2000	Document:	EXM-POR-001
	WRITTEN EXAMINATION	Revision:	0
psc		Date:	Juty 16, 2013
PRECIDINI AND MELANOC	CONCRETE & REINFORCING STEEL	Document Type:	Corporation Standards
		Page:	3 of 3
9. When should the d	haracter height of near-distance test charts be mo	easured?	l.
a) After the inspe	ction		
b) When requeste	ed by the Registered Engineer ant Condition is found		
(d) Before use of i			
10. In tendon anchora	ge areas, acceptable cracks in the concrete adjac	ent to the bearing p	lates do not exceed.
(a) 0.010 inch in w b) 0.100 inch in w			
c) 0.001 inch in w	vidth		
d) 1.000 inch in w	<i>v</i> idth		
11. What amendment Edition with 1992 /	to 10 CFR 50 incorporated by reference the requi	rements of ASME S	ection XI, 1992
E010011 WID1 1992 /	Audenua /		
a) 1992 Addenda			
 (b) 10 CFR 50.55 c) Appendix A 	а.		
d) 10 CFR 10.30			
12, A detailed visual ir	nspection requires what maximum examination di	stance?	
a) 7 feet (6) 2 feet			
c) 35 feet			
d) 4 feet			
13. How often is Level	I II re-certification required?		
a Every 5 years			
 b) Every 3 years c) Every 3 month 			
d) Every year	15		
14. Which of the follow	ving degradation mechanisms to rebar is associa	ted with changes in	the permeability of
concrete, presenc	e of an electrolyte, or microbiological attack?		
a) Irradiation			
b) Fatigue			
C Corrosion d) Thermal effec	is		
15. Level II minimum	education required for certification is?		
a) MBA degree			
(b) High school o	r equivalent		
c) No education			
d) One year of c	onege		

PS CONTRACTOR	IWL-2000 WRITTEN EXAMINATION POST-TENSIONING COMPONENTS	Document: Revision: Date: Document Type: Page:	EXM-PQR-002 0 July 16, 2013 Corporation Standards 1 of 3
NAME: <u>Ronald A</u> SOCIAL SECURITY NUMB GRADE: <u>13/15 = 86.1</u>	er:	10/18/13 A.F.E. 10/	12/13
administration that could co compromise by others prior	ed nor observed any aid or information regarding impromise this exam's integrity. I also understan , during, or subsequent to the exam administration	d my obligation to re	eport any exam
	Pro	nis entire examinatio	
en le suit a fine en second de la companya de la co	Student Signature	/ Date	
A 1 O 2 O 3 O 4 O 5 O	B C D A B C D 0 0 0 7 0 0 0 11 0 0 0 7 0 0 0 0 11 11 12 13 14 15 15 15 15 15 15 15 15 15 15	A B C D 1 O O I O 2 O O I O 3 O I O O 4 O O O	

EXM-POR-002 RO

	IWL-2000	Document:	EXM-PQR-002
002	WRITTEN EXAMINATION	Revision:	0
NSK		Date:	July 16, 2013
PRECIDION STREET, ANDE	POST-TENSIONING COMPONENTS	Document Type:	Corporation Standards
		Page:	2 of 3
1. Per IWL what tendo	n anchorages are exempt from Detailed Examin	hation?	
b) Inaccessible du	e to structural obstructions e to radiological hazards e to safety concerns		
	ntains requirements for a Responsible Engineer. aer. What is he responsible for?	He must be an expe	erienced Registered
 b) Evaluation of el 	iction, and training of concrete examination pers		rs
3. PSC Qualification for	or IWL Examiners certifications comply to:		
a) IWE 92 b) IWL 2001 editio C) IWL 2010 editio d) ACI 301	on with 2003 addenda on with 2011 addenda		
4. What is detailed ex selected for in-serv	amination used to detect on Containment Post 1 ice inspection?	Fensioning Systems	(lendon anchorage)
a) Dissolved wate b) Amount of grea c) Grease can gre d) Evidence of fre	use in the grease can ease level		
5. The tendon bearing	g plate is to be given what kind of visual inspecti	on?	
a) Close-Up b) General c) Detailed e) None			
6. What is the typical	PSC procedure used for Anchorage Inspection?	7	
a) SQ 2.0 b) SQ 12.1 (c) SQ 8.0 d) SQ 4.0			
7. Following the re-te	nsioning of a tendon that has been de-tensioned	d a Detailed inspection	on is used to detect:
c) Temperature c	ates in the grease.		
8. Which of the follow a) Pressure gage b) Flashlight c) Camera (S) Optical Compa		ination?	

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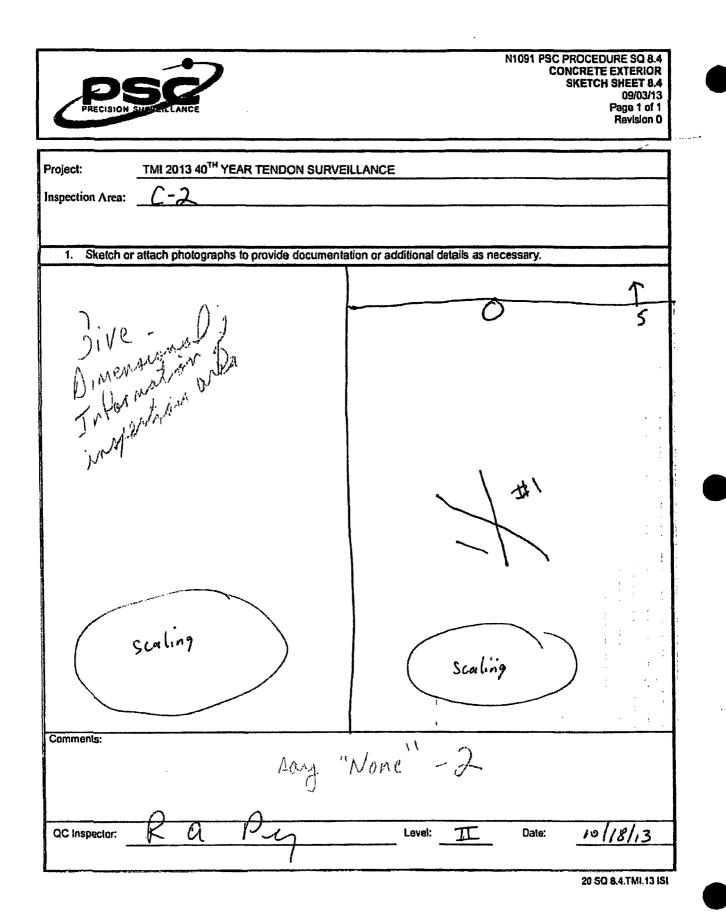
		IWL-2000	Docur	ment:	EXM-PQR-002
ne		WRITTEN EXAMINATION	Revis	ion:	0
I WAA AM BI COME ST			Date:		July 16, 2013
\mathbf{C}		POST-TENSIONING COMPONE	IVIS Docu	ment Type:	Corporation Standards
			Page		3 of 3
(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	Broken wires of Amount of nitra Temperature of the grease ca PSC Qualificati Responsible Er WL Supervisor Project Manage Project Superin t is General Ex cited for in-servi Cacks in anche None of the abie t is Detailed Ex cited for in-servi Chemistry of sh Material type of Displacement of Diameter of Sh t is Detailed Ex cited for in-servi Shim finish Missing button Anchor head fin Bushing hardno General and De r	WRITTEN EXAMINATION POST-TENSIONING COMPONE asioning of a tendon that has been de-ter strands. tes in the grease. the concrete. In has been galvanized. on for IWL examinations who approves agineer (P.E.) ar tendent amination used to detect on Containment ice inspection? Zing on Grease can Grease.Can orage hardware ove tamination used to detect on Containment ice inspection? tim material f shims ims tamination used to detect on Containment ice inspection? tim material f shims ims tamination used to detect on Containment ice inspection? tim material f shims ims tamination used to detect on Containment ice inspection? tim material f shims ims	NTS Date: Document Page: Insigned a Detail the qualification Int Post Tensionian Int Post Tensionian	ment Type: ed inspectio s of the Exa ng Systems ng Systems	0
15. For Posi serv a) (6) c)	40/40 or better nuclear plants -Tensioning Sy ice inspection p Every 6 months Every 5 years Every 3 years Every 2 years	that completed their Structural Integrity T vstem IWL Examination of tendon ancho per IWL?	"est 20 years ag rages be perforr	o how often ned an tend	must the Containment lans selected for in-

EXM-POR-003 Document: IWL-2000 **GENERAL & DETAILED VISUAL** Revision: 0 **EXAMINATION OF CONCRETE** Date: July 16, 2013 **Corporation Standards Document Type:** PRACTICAL EXAMINATION CHECKLIST Page: 1 of 3 Perr y Ronald A. 10/18/13 DATE: NAME: SOCIAL SECURITY NUMBER: EXAM NUMBER: **INSTRUCTOR/GRADED BY:** GRADE: I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration. I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter. < a 10/18/13 Date I have read and understand the above statements: Student Signature INSPECTION POINTS POINTS GRANTED/COMMENTS **POINT VALUE** Select procedure 10 Varify revision Select form 10 +1 Verify revision Select equipment 5 Verify calibration/resolution Verify adequacy of lighting 5 Prior to and during inspection Record part/item number 5 On inspection form Inspect component/part 15 Identify discontinuities Compare discontinuities to 15 Recording criteria in procedure Correctly record discontinuities 25 Sign and date form 5 Complete form 5 Accurate and legible TOTAL

PRECIBION SUBJECT LANCE	,	NIU	91 PSC PRC CONC DAT	RET	E EX HEE Pa	XTE ET S 09 990	
VISUAL EXAMINA	TION - GENERAL VISUA	L EXAMINAT	ION				
Project TMI Surveill	ance # <u>40TH</u> Year	2013					
Inspection Area: <u>C-2</u> Equipment Used -/							
			•				
	Concrete Surface Condition						,
Containment Surface (Findings and Descriptio			NI	T	10	Т	RI
	n sketch				Π		17
	ed on s side			T	, ï.		
Il made made indenta							13
scaling noted on	N end of inspection	aren			1		
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and a star a	<u>18 - 18 </u>			\vdash	H	H	-
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				H	Τ	H	
(Use as many sketch sheets (page 2) as	needed to report any Recordal	ble Indication (RI) or Info	rm	atlo	n	Only
	the purpose of documentation						-
	cations to be Examined For (PSC						
Leaching or Chemical Attack	Deterioration of any Con						
Abrasion or Erosion Degradation Popouts and Voids	Tendon Grease on Expos Corrosion on Grease Car						
Cracks	*Excessive Corrosion of				es		
Scaling	*Detached Embedments	or Loose Bolting					
Spalls	*Indication of Degradati (* The owner/agent mu				fata		
Corrosion Staining on the Concrete Surface Exposed Reinforcing Steel Surface Patches or Repairs	(" The owner/agent mu	st de nonneu lor i	nese noted (:0110	littor	19.)	
Comments and Disposition by Responsible Engine	er	Acceptable	Unaccept	ible			•*******
Comments:							
Inspector & Level: Kon Pern	y Rapy II	Date:	10/18/	21			
Responsible Engineer:	•	Date:	<u> </u>				
ANII:		Date:		,			

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20 SQ 8.4.TMI.13 (S)



Topical Report 213 Attachment 3 Page 144 of 154

PRECISION SHORE LANCE	N 102	1 PSC PROC CONCR DAT/	ETE EXT SHEET (Pag	TERIO
VISUAL EXAMINATION	- GENERAL VISUAL EXAMINATI	ON		
Project <u>TMI</u> Surveillance # Inspection Area: <u>C-1</u>	<u>40TH</u> Year <u>2013</u>			
Equipment Used				
Conc	rete Surface Condition	·····		
Containment Surface (Findings and Description)		NI	10	RI
cracks esnoted on sk	ictub (Passive)		ŤŤ	
poports and indentations	Noted random Vin area	-+++		┼┼┲
popoors and more inter	WUIED THAD MIYTS GIEG	╾┼╞╉╴	┼┝╤╄╴	┼╞═
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	 		┨╞╡	╉┾═
	d to report any Recordable Indication (R rpose of documentation and orientation s to be Examined For (PSC Procedure 8.4)		mation	Only
Leaching or Chemical Atlack	Deterioration of any Concrete Coating (if ap	licable)		
Abrasion or Erosion Degradation	Tendon Grease on Exposed Concrete Surface	:5		
Popouts and Voids	Corrosion on Grease Cans, Bearing Plates or	Anchorage	-	
Cracks Scaling	*Excessive Corrosion on Exposed Embedde	ed Metal Surf	laces	
Spalls	*Detached Embedments or Loose Bolting *Indication of Degradation Due to Vibration	n		
Corrosion Staining on the Concrete Surface Exposed Reinforcing Steel Surface Patches or Repairs	(* The owner/agent must be notified for th		nditions	.)
Comments and Disposition by Responsible Engineer Comments:		Unacceptab	le	
Inspector & Level: Ron Piny K		10/18/1	3	
Responsible Engineer: ANII:	Date:			

PRECISION	SWEERTLANCE	N1091 PSC PROCEDURE SQ 8.4 CONCRETE EXTERIOR SKETCH SHEET 8.4 09/03/13 Page 1 of 1 Revision 0
Project:	TMI 2013 40 TH YEAR TENDON SURVEILLANCE	
Inspection Area:	<u>C-1</u>	
1. Sketch o	r attach photographs to provide documentation or additional	details as necessary.
		Ţ,
		Floor
Comments: In a Popouts Majority	leatations noted randomly in area were noted randomly - all mea clengths of crecks were greater	a due to dropped egent. sured less then 2° in length than 0.040° in width Consider
QC Inspector:	Ra Per Level:	I Date: 10/18/13

Document: EXM-POR-004 IWL-2000 DETAILED VISUAL EXAMINATION OF Revision: Ø REINFORCING STEEL Date: July 16, 2013 Document Type: **Corporation Standards** PRACTICAL EXAMINATION CHECKLIST 1 of 3 Page: Ronald. Perry A. DATE: 10 NAME: SOCIAL SECURITY NUMBER: **EXAM NUMBER:** GRADE: INSTRUCTOR/GRADED B I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration. I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter. C Q Py Student Signature <u>10/18/13</u> I have read and understand the above statements: POINTS GRANTED/COMMENTS POINT VALUE INSPECTION POINTS Select procedure 10 +ID Verify revision Select form 10 Verify revision Select equipment 5 Verify calibration/resolution Verify adequacy of lighting 5 Prior to and during inspection Record part/item number 5 On inspection form Inspect component/part 15 Identify discontinuities Compare discontinuities to 15 Recording criteria in procedure Correctly record discontinuities 25 Sign and date form 5 Complete form 5 Accurate and legible TOTAL

Project: IMI 2013 TENDON SURVEILLANCE UNIT 1 Tendon No.: $B - 1$ Tendon End: Shop Field (7.4) Bearing Plate Identification #: If a Aback of Aback - "Wone Form of" None Form of" 1. Orient the bearing plate with the sketch below. 1. Locate the bearing plate with the sketch below. 1. Locate the bearing plate with the sketch below. 2. Locate the bearing plate with the sketch below. 1. Locate the bearing plate identification and document the location on the sketch. 3. Sketch all cracks, include grant of bearing plate. 6. For cracks equal to or wider than 0.010 inches, document condition on an Nonconformance Report in accordance with Procedure 0A 9.0, NONCONCONCONSUMCES, for Exelon approval. 11. 0.5^{+1} 0.0^{+1} 12. 0.0^{+1} 0.0^{+1} 13. 0.5^{+1} 0.0^{+1} 14.1 0.0^{+2} 0.0^{+1} 13. 0.5^{+1} 0.0^{+1} 14.1 $Concrete misSing (Gpall)$ 0.0^{+1} 15. 0.0^{+1} 0.0^{+1} 14.1 $Concrete misSing (Gpall)$ 0.0^{+1} 15. 0.0^{+1} 0.0^{+1} 0.0^{+1} 15. 0.0^{+1} 0.0^{+1}	PRECISION EUROPELANCE	Practical	N1091 PSC PROCEDURE SQ 8 BEARING PLATE INSPECTIO DATA SHEET SQ 8 09/03/ Page 1 of Revision)N 1.3 13 7 1
(7.4) Bearing Plate Identification #: 1. Orient the bearing plate with the statch below. 2. Locate the bearing plate identification and document the location on the eketch. 3. Sketch all cracks, including other defects, existing on the concrete in the area surrounding the tendon anchorage for a distance of 24 inches from the edge of the bearing plate. 4. For cracks equal to or wider than 0.001 inches, document condition on an Nonconformance Report in accordance with Procedure QA 9.0, Nonconformances, for Exelon approval. 11 ¹ 0.081^{10}	Project: TMI 2013 TENDON SURVE	ILLANCE		
 Orient the bearing plate with the skatch below. Locate the bearing plate identification and document the location on the sketch. Sketch all cracks, including other defects, erisding on the concrete in the area surrounding the landon anchorage for a distance of 24 inches from the edge of the bearing plate. For cracks equal to or wider than 0.010 inches, document condition on an Nonconformance Report in secondance with Procedure QA 9.0, NONCONFORMANCES, for Exclon approvat. If is a state of the bearing plate. Use the concrete missing (G p 0.11) and the containment. The concrete missing (G p 0.11) at a state of the containment. If is a sharing create on addth If is a sharing create on addth If is a state of the containment. If is a sharing of the defect. If is a sharing create on addth If is a sharing of the containment. If is a sharing create of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a state of the containment. If is a sharing create is a	Tendon No.: <u>B-</u>			
 2. Locate the bearing plate identification and document the location on the sketch. 3. Sketch all cracks, including other defects, existing on the concrete in the area surrounding the tendon anchorage for a distance of 24 inches from the edge of the bearing plate. 4. For cracks equal to or wider than 0.010 inches, document condition on an Nonconformance Report in accordance with Procedure QA 9.0, NONCONFORMANCES, for Exelon approval. 11' - 0' - 0' - 0' - 0' - 0' - 0' - 0' -	(7.4) Bearing Plate Identification #:	Thy the	Idray "None format	/11
$\frac{11^{12}}{0.08W}$ 11	 Locate the bearing plate identification Sketch all cracks, including other do 24 inches from the edge of the bearing For cracks equal to or wider than 0. 	on and document the location on the sketch. efects, existing on the concrete in the area surrounding ng plate. 010 inches, document condition on an Nonconforma		ho
$\frac{1}{2} = \frac{1}{2} = \frac{1}$	11"L 0.0 6.5*L	aw at 3 10.5"L Profit	10 ¹	
Auxiliary Light Source used: Yes No Flash light (7.3) Illumination source; out doors (7.5) Cracks $\geq 0.010^{\circ}$ Yes No Quantity: $\frac{5e^{2}}{sketch}$ Max. Width: $\frac{5e^{4}}{sketch}$ Max Length: $\frac{5e^{6}}{sketch}$ NCR#: $\frac{10}{18}$ QC Inspector: R R Provide Level: II Date: $10/18/13$	tt concrete missing(Gpin It 3-hairline creck-no width	up. Vertical Tendon, this is toward the center of the containment.	1 the Operation of the state of	dec en j)
source; <u>outdoors</u> (7.5) Cracks $\geq 0.010^{\circ}$ Yes \square No Quantity: $\frac{5e^{2}}{skchch}$ Max. Width: $\frac{5e^{4}}{skchch}$ Max Length: $\frac{3e^{6}}{skchch}$ NCR#: <u>xxxxx</u> QC Inspector: <u>Rapy</u> <u>Level:</u> <u>Date:</u> <u>10/18/13</u>	Auxiliary Light Source used: 🔳 Yes		-	2
(7.5) Cracks ≥ 0.010° Yes No Quantity: <u>skelek</u> Max. Width: <u>skelek</u> Max Length: <u>skelek</u> NCR#: <u>xxxx</u> QC Inspector: <u>Ra Py</u> Level: <u>II</u> Date: <u>10/18/13</u>	source: <u>out doors</u>		۰۱۰ <u>میں میں میں میں میں میں میں میں میں میں </u>	
	(7.5) Cracks ≥ 0.010" Wes □ No	Quantity: State Max. Width: State Max Length:	sketter NCR#: xyester	_
QC Reviewed: Level: Date:	QC Inspector: Ra Py	Level:	Date: 10/18/13	
	QC Reviewed:	Level:	Date:	

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PRECISION SUMERICLANCE		Practical		C PROCEDURE SQ 8.3 G PLATE INSPECTION DATA SHEET SQ 8.3 09/03/13 Page 1 of 1 Revision 0
Project: TMJ 2013 TENDON SURVEILLAI	NCE			
Tendon No.: <u>B-2</u> Te	endon End: 👘 🖄		C Shop	Field
(7.4) Bearing Plate Identification #:	ىيىمى ² يەرىمەردىمى	None Fr	juns!	
 Orient the bearing plate with the sketch bearing plate identification and Locate the bearing plate identification and Sketch all cracks, including other defects, 24 inches from the edge of the bearing plat For cracks equal to or wider than 0.010 in 	i document the locat existing on the concr e. Iches, document con-	rete in the area surroun	-	-
Procedure QA 9.0, NONCONFORMANCES, for	Exelon approval.			. /) //)
#12 #1 concrete missing	7"	μ 35ω	/ Ske	tch All Cracks
#2 Crosion		1 1/2"L		and I have
#3 exposed end of reber	On Hoop and do	me this edge is		τ.
#4 popouts Hairline.crecks noted-cannot insert freder gage into	Vertical Tendon, center of the con	this is toward the tainment.		
Notros				
) a	Ò	6	fa of
±3 ±3	#3/	土3	# 3	±3
		14	`	#1
Auxiliary Light Source used: Yes No (7.3) Illumination source; Out doors	Fleshlight			(\square)
(7.5) Cracks ≥ 0.010* W Yes I No Quant	ily: <u>2</u> Max. Wic	dih: 0,035 Max Leng	gilh: stetch	NCR#: Kxxxx
QC Inspector: Ra Py		Level: <u>T</u>	Date:	10/18/31

IWL-2000 Document: EXM-POR-005 DETAILED VISUAL EXAMINATION OF Revision: 0 POST-TENSIONING SYSTEM July 16, 2013 Date: **COMPONENTS** Document Type: **Corporation Standards** PRACTICAL EXAMINATION CHECKLIST Page: 1 of 3 DATE: 10/18/13 Ronald err) NAME: SOCIAL SECURITY NUMBER: EXAM NUMBER: INSTRUCTOR/GRADED BY GRADE: I have neither given, received nor observed any aid or information regarding this exam prior to or during its administration that could compromise this exam's integrity. I also understand my obligation to report any exam compromise by others prior, during, or subsequent to the exam administration. I acknowledge that this examination is a way of demonstrating my knowledge of the subject associated with this examination and that I have had the opportunity, on my request, to review this entire examination with the instructor to ensure my understanding of the subject matter. Rmald May 10/18/13 I have read and understand the above statements: POINT VALUE INSPECTION POINTS POINTS GRANTED/COMMENTS Select procedure 10 Verify revision +-Select form 10 Verify revision Select equipment 5 Verify calibration/resolution Verify adequacy of lighting 5 Prior to and during inspection Record part/item number 5 On inspection form Inspect component/part 15 Identify discontinuities Compare discontinuities to 15 Recording criteria in procedure Correctly record discontinuities 25 Sign and date form 5 Complete form 5 Accurate and legible TOTAL

PRECISION SURVINCIANCE	Da	EDURE SQ 8.0 INSPECTION Its Sheat 8.0A 09/03/13 Page 1 of 1 Revision 0 on: 1, 10/04/13
Project: TMI 2013 TENDON SURVEILLANCE		1
(7.3)Tendon No.: <u>A - </u> Tendon E	End:	\mathcal{O}
ANCHORAG	SE INSPECTION CRITERIA Mire Removal Post Re-Tensioning	Q.C. Signoff
0 & 8.7.1 - CORROSION & CRACK INSPECTION		U.C. Signon
(6.7) Buttonheads Level: A ⁽¹⁾	(9.1) Cracks 🔲 Yes 🖽 🗰 No 🔛 N/A	125
(8.7) Anchorhead Level: A (1)	(9.1) Cracks Yes ⁽²⁾	Rep
(8.7) Shims Level: A (1)	(9.1) Cracks Yes (2) No N/A	1-118/3
(8.7) Bearing Plate Level: B (1)	(9.1) Cracks 🔲 Yes (2) 📕 No 🛄 N/A	
(1) - Corrosion Level of C requires a NCR. (2) Compose a s	sketch of the crecks on Sketch Sheet 8.0 and initiate a NCR.	
10.0 - BUTTONHEAD INSPECTION		
Offsize (Malformed)	and the second	
Protruding/unseated wire/outtonheads		!
Ø Broken/missing wire/buttonheads	0000000	Rap
Previously Identified as missing	\sim	10/18/13
Discontinuous - removed this		
surveillance.		
* wire(a) removed during this surveillance for testing		
none		
(10.2) Anchorhead I.D. found		
Located on Sketch: Yes No		
(10.4) Missing Buttonheads Found:		
Yes 🔲 No Quantity: 2	00000 missing	Ì
Additional Information:	A second s	
Noto Shina Stark Here From		¥
(IO)		
	·····	·;
(11.2) Number of Protruding Buttonheads (-):	(8.3) Illumination source <u>Flashi</u> ght	- a.A
(11.3) Number of Missing Buttonheads (Ø, Ø): 2	(8.5) Shim Gap inspection: Acceptable Un-Acceptable	Raf Isla
(11.4) Total of Protruding + Missing Buttonheads:	(11.6) Continuity Test Requested? Yes No	10/18/13
(11.5) Total # of Effective Buttonheads Seated: /68	Wires Identified? 🔲 Yes 🗰 No	
(11.7) Overall Results 🔲 Acceptable 📲 Un-Acceptabl	e Customer Notified NCR#: <u>////////////////////////////////////</u>	<u></u>
QC Reviewed: Ra Ry	Level: Date: /b	118/13

It shims are not aligned perollel offort 1/8" on 5 side; 5/32" Nside 18508.0.TML13151 Rev 1 Bearing plate has general oxidation - no bas of material Aunch marks (hammer) noted on face Anchorhead Shinds

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PRECISION SURPLAN			SC PROCEDURE SQ 8.0 ICHORAGE INSPECTION Sketch Sheet 8.0 09/03/13 Page 1 of 1 Revision 0 Revision: 1, 10/04/13
Project: Exelon 2013	TENDON SURVEILLANCE		
Tendon No.:	Tendon End:	C Shop	Field
number; record the locat Sheets as necessary bei	as it appears in the anchorheads/bushing Ion of the anchorhead or bushing identifi ng sure to list the page number below ar se Report in accordance with Procedure C	cation and apply to the sketch. Und to apply a Sketch Number to each	se as many Sketch ach unit with cracks.
	┊ <mark>┝┯╋╍╊╍┠╌┟╶┟</mark> ╶╏╺╏╺ <mark>┍╍┧╍┝╼╞╸</mark> ┝╍╏╼╏		
		AIIIII	
┠╂╎┵╉╋	<u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>		
QC Inspector:	a Py	Level: IF	Date: 10/18/13
QC Reviewed:		Level:	Date:
			18 SQ 8.0.TMI.13 ISI Rev 1

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PRECISION BUATARTLANCE	Da	EDURE SQ 8.0 INSPECTION Ita Sheet 8.0A 09/03/13 Page 1 of 1 Revision 0 on: 1, 10/04/13
Project: TMI 2013 TENDON SURVEILLANCE		[1
(7.3)Tendon No.: <u>A - A</u> Tendon I		\mathcal{D}
ANCHORAC	GE INSPECTION CRITERIA	
As-Found Dest De-Tensioning / Pre-	Mre Removal Dest Re-Tensioning	Q.C. Signoff
0 & 8,7.1 - CORROSION & CRACK INSPECTION		
(8.7) Buttonheads Level: <u>A (1)</u>	(9.1) Cracks 🔲 Yes (2) 🚰 No 🚺 N/A	
(8.7) Anchorhead Level: A (1)	(9.1) Cracks 🔲 Yes (2) 🔛 No 🛄 N/A	-
(8.7) Shima Leval: A (1)	(9.1) Cracks 🔲 Yes 💷 🖬 No 🔲 N/A	
(8.7) Bearing Plate Level: B (1)	(9.1) Cracks 🔲 Yes 💷 🖬 No 🔛 N/A	L.
(1) - Corrosion Level of C requires a NCR. (7) Compose a	sketch of the cracks on Sketch Sheet 8.0 and initiale a NCR.	1
10.0 - BUTTONHEAD INSPECTION	6. Jan V	17
Offsize (Malformed)	17/113 54	all f
	X this sh howe be sheet	en Data
Protruding/unseated wire/buttonheads	I line	200
************	SHEEN SHEEN	0.08
Ø Broken/missing wire/buttonheads	R×208	(-1)
Previously identified as missing		•
Discontinuous – removed this	00000000000000	:
surveillance.	00000000000000000000000000000000000000	1
Surveillance for testing		
(10.2) Anchomead I.D. RX 208	000000000000000000000000000000000000000	
Located on Sketch: The Yes INO		
(10.4) Missing Buttonheads Found:		
Yes No Quantity:	0000000 ' % *'''/	
A different later of the later	protruding	
Additional Information:	1 1/33	The second second
Note Shim Stack Height		
(10)	and the second s	
······		-; 1
(11.2) Number of Protruding Buttonheads (-):	(8.3) Illumination source	
(11.3) Number of Missing Buttonheads (Ø , Ø):	(8.5) Shim Gap Inspection: 🔲 Acceptable 🖬 Un-Acceptable	
(11.4) Total of Protruding + Missing Buttonheads: 3	(11.6) Continuity Test Requested? [] Yes [] No	
(11.5) Total # of Effective Buttonheads Seated: 167	Wires Identified? 🗌 Yes 🛄 No	and the
		1 200
(11.7) Overall Results 🔲 Acceptable 🛄 Un-Acceptable	ble Customer Notified NCR#: <u>XXX</u>	
		<u> </u>
OC Reviewed: R.a. Pm	I must IL Date /0	0/18/13
QC Reviewed:	Level: Date:	–
I		

Shim separation on Nend almost touching - Send gap was 15/6" 18 50 8.0.TMI.13 ISI RAV 1 Shim on N. side had numerous hammer indentations - Shim's hove will scale protruding buttonheads: 1 - 17/32"; 1- 19/32" in height Topical Report 213 Attachment 3 Page 153 of 154

PRECISION S	A CLANGE	N10	ANCHORAG SI	EDURE SQ 8.0 E INSPECTION ketch Sheet 8.0 09/03/13 Page 1 of 1 Revision 0 Hon: 1, 10/04/13
Project: Exelon	2013 TENDON SURVEILLANCE		1	
Tendon No.:	Tendon End:	Sh	op	🗌 Field
number; record the Sheets as necessa	crack as it appears in the anchorheads/bushings, sh location of the anchorhead or bushing identification ry being sure to list the page number below and to rmance Report in accordance with Procedure QA 9.	n and apply to the sketch apply a Sketch Number	. Use as ma to each unit w	ny Sketch ith cracks.
			HH	
		<u> </u>	<u> </u>	
QC Inspector:	Rapy	Level:	Date:	10/18/13
QC Reviewed:		Level:	Date:	
``````````````````````````````````````				0.TMI.13 ISI Rev 1

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