Testing at MCTSSA
What, How, Why
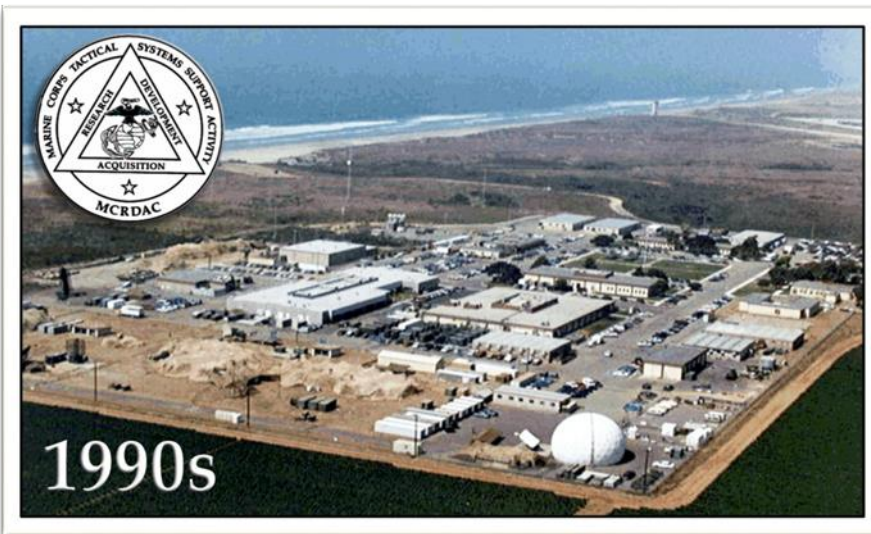
Kimberly Reynolds
Test & Certification Group (TCG)

06 February 2019

MCTSSA

1970s

1980s

1990s

2000s

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What We Test

- C4I

- Sensors

- Tactical Networking

- Communications

- Cybersecurity

C4I

Combat Operations Center (COC)

C4I

Advanced Field Artillery Tactical Data System (AFATDS)

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C4I

Joint Tactical Common Operational Picture (COP) Workstation (JTCW)

C4I

Tactical Voice Switching System (TVSS)

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C4I
Networking On-The-Move (NOTM)

C4I

Common Aviation Command and Control System (CAC2S)

SENSORS

AN/TPS-80 Ground/Air Task Oriented Radar (G/ATOR)

SENSORS

AN/TPS-59 3-D Air Search Radar

TACTICAL NETWORKING
Tactical Data Network (TDN)

TACTICAL NETWORKING

Joint Enhanced Core Communication System (JECCS)

TACTICAL NETWORKING

Data Distribution System – Modular (DDS-M)

TACTICAL NETWORKING

Multifunctional Information Distribution System (MIDS)

TACTICAL NETWORKING

Defense Advanced Global Positioning System (GPS) Receiver (DAGR)
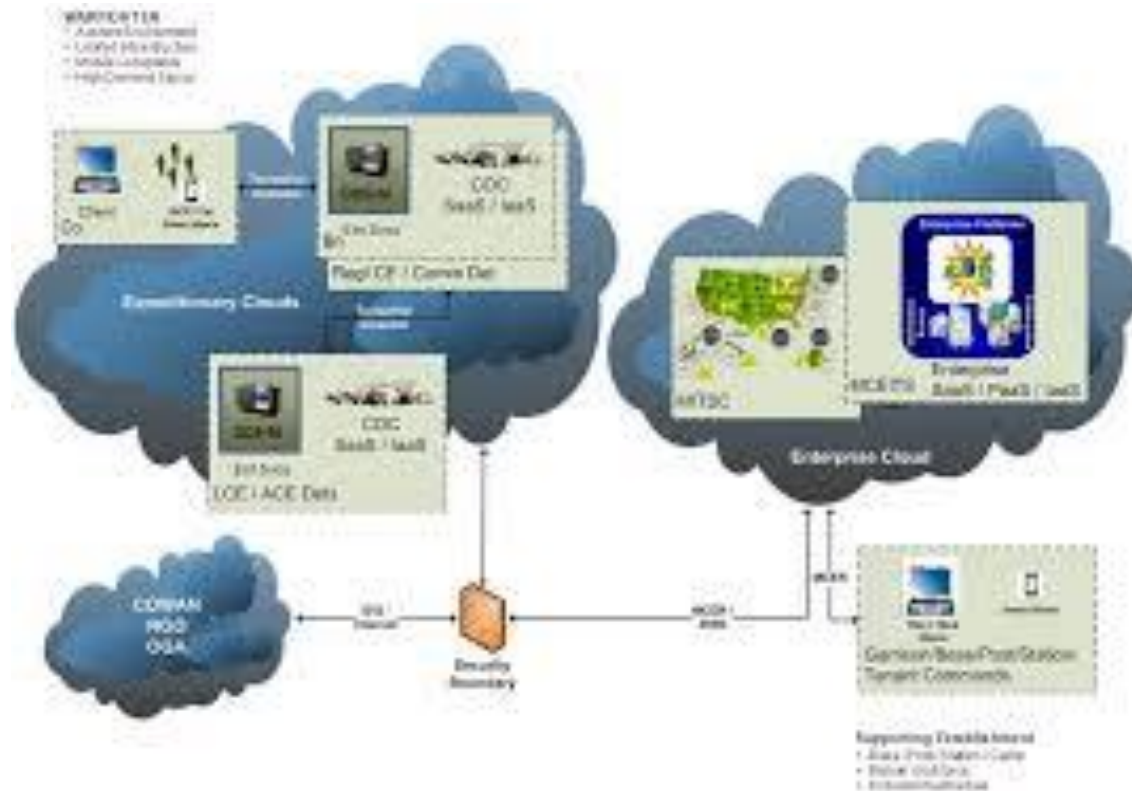
TACTICAL NETWORKING

Marine Corps Enterprise Network (MCEN)

TACTICAL NETWORKING
Wireless

COMMUNICATIONS

CYBERSECURTY

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What We Test

- C4I

- Sensors

- Tactical Networking
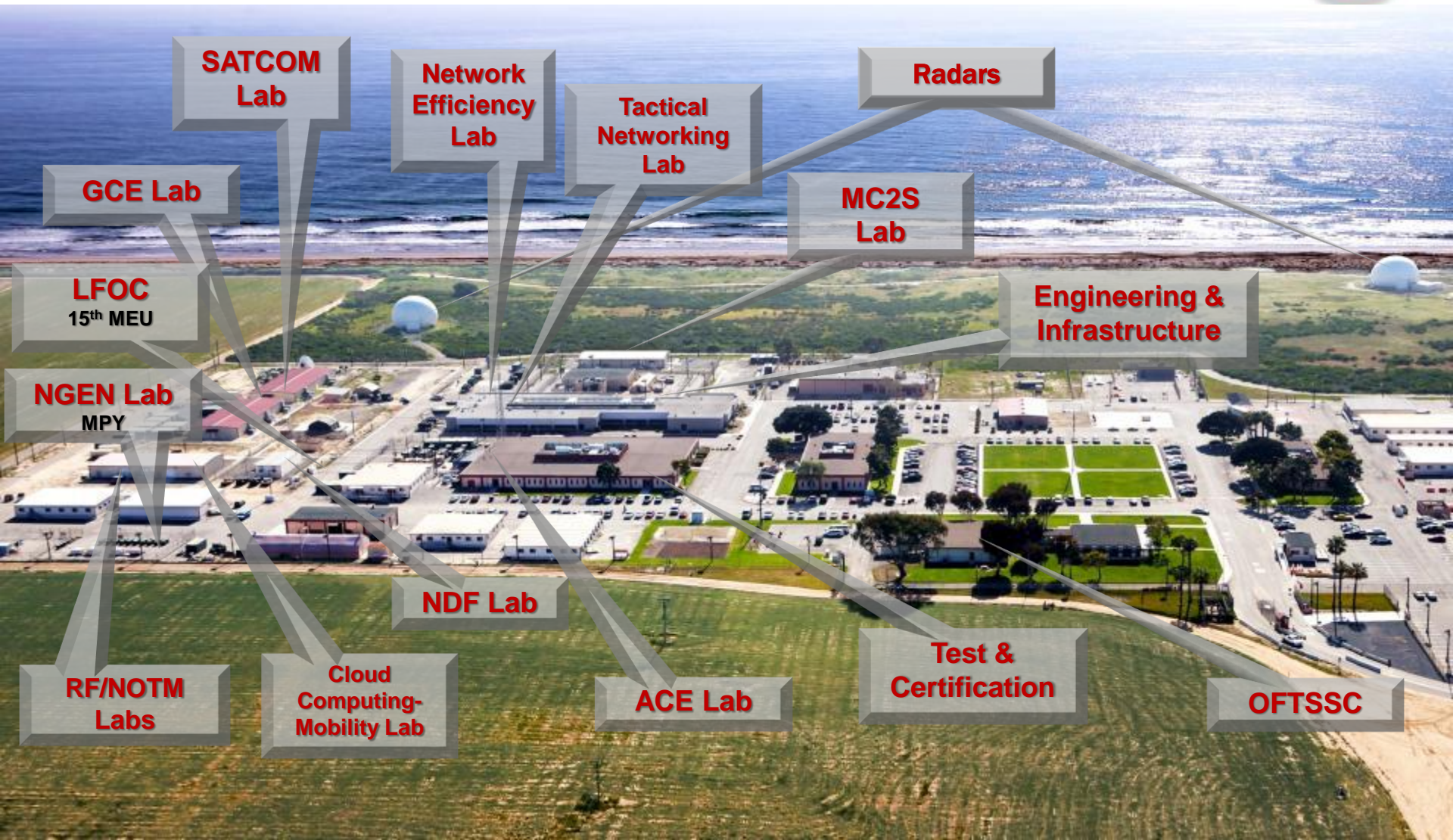
- Communications

- Cybersecurity

How We Test

Testing is conducted in one or more of the laboratories that comprise the Marine Air Ground Task Force (MAGTF) Systems Integration Environment (SIE) also known as VII MEF.

The SIE is a dynamic, scalable, and instrumented hardware-in-the loop distributed facility that represents each component of the MAGTF, to include a high fidelity afloat facility that integrates Navy communications networks.

The SIE promotes the ability to perform operationally relevant testing through the use of tactical systems and mission based test threads.

MAGTF SIE

SATCOM Lab

Network Efficiency Lab

Tactical Networking Lab

Radars

GCE Lab

MC2S Lab

LFOC
15th MEU

Engineering & Infrastructure

NGEN Lab
MPY

NDF Lab

RF/NOTM Labs

Cloud Computing-Mobility Lab

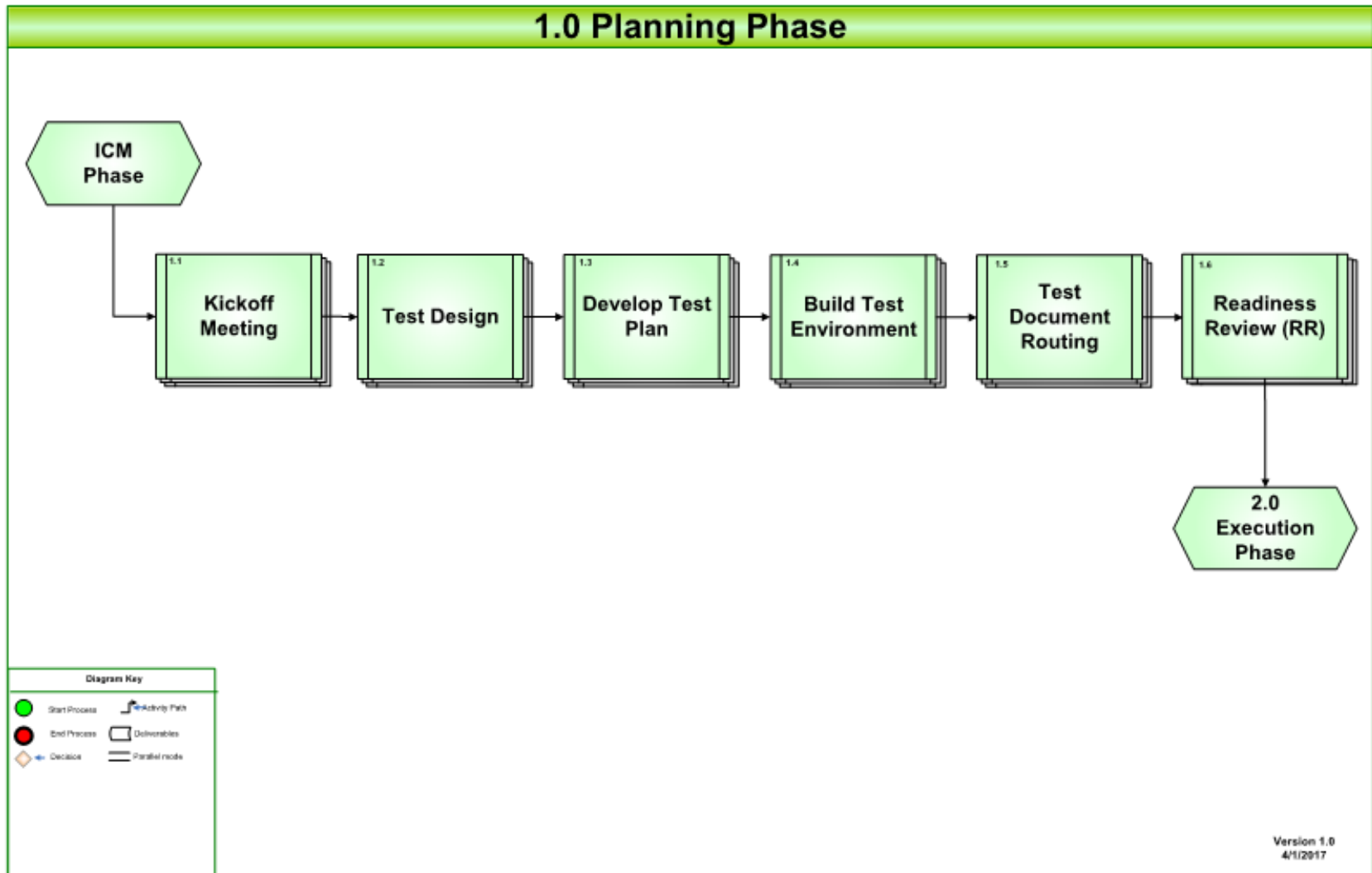ACE Lab

Test & Certification

OFTSSC

How We Test

We use detailed processes for each phase of a test event. These processes, originally developed by Test & Certification Group (TCG) for testing, are now used by the Activity for all events.

- Planning
- Execution
- Analysis
- Reporting

PLANNING

1.0 Planning Phase

```
ICM
Phase
   │
   └──→ [1.1 Kickoff Meeting] → [1.2 Test Design] → [1.3 Develop Test Plan] → [1.4 Build Test Environment] → [1.5 Test Document Routing] → [1.6 Readiness Review (RR)]
                                                                                                                                                      │
                                                                                                                                                      ↓
                                                                                                                                              2.0 Execution Phase
```

Diagram Key

- 🟢 Start Process
- 🔴 End Process
- ◇ Decision
- Activity Path
- Deliverables
- Parallel node
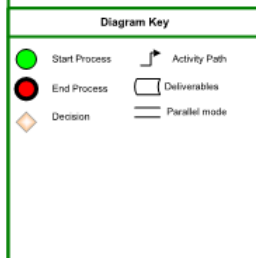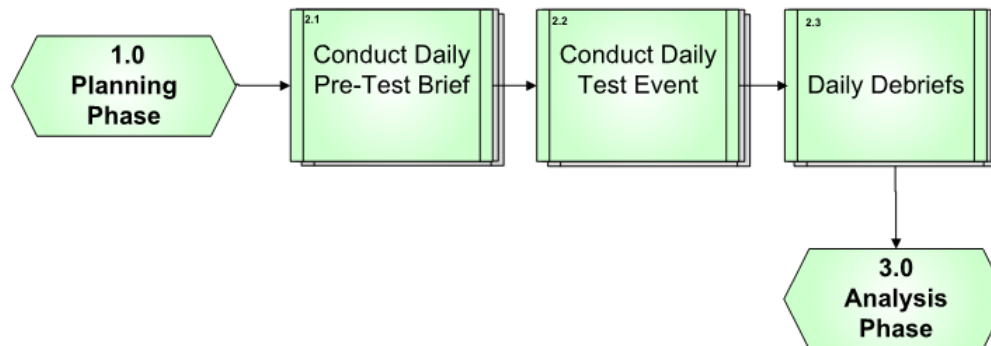
Version 1.0
4/1/2017

PLANNING

Test Design Meeting Topics

- System Under Test (SUT)
- Purpose of Test
- Objectives SUT Requirements
- Schedule
- Customer
- Re-use (Test Procedures, Documentation)
- STAT/DOE
- Virtualization
- Test Automation
- Cyber T&E
- External Connectivity

- Operational Environments
- Operational Threads
- Backwards Compatibility Issue(e.g., system, interfaces)
- Unique Requirements (e.g., equipment, skills sets)
- Data Analysis Approach
- Previous Testing (e.g., background)

- Current SUT issues (e.g., performance) OFS, TIRs
- Other Testing opportunities
- Test locations (MCTSSA, Other)
- Equipment & personnel requirements
- Known Risks
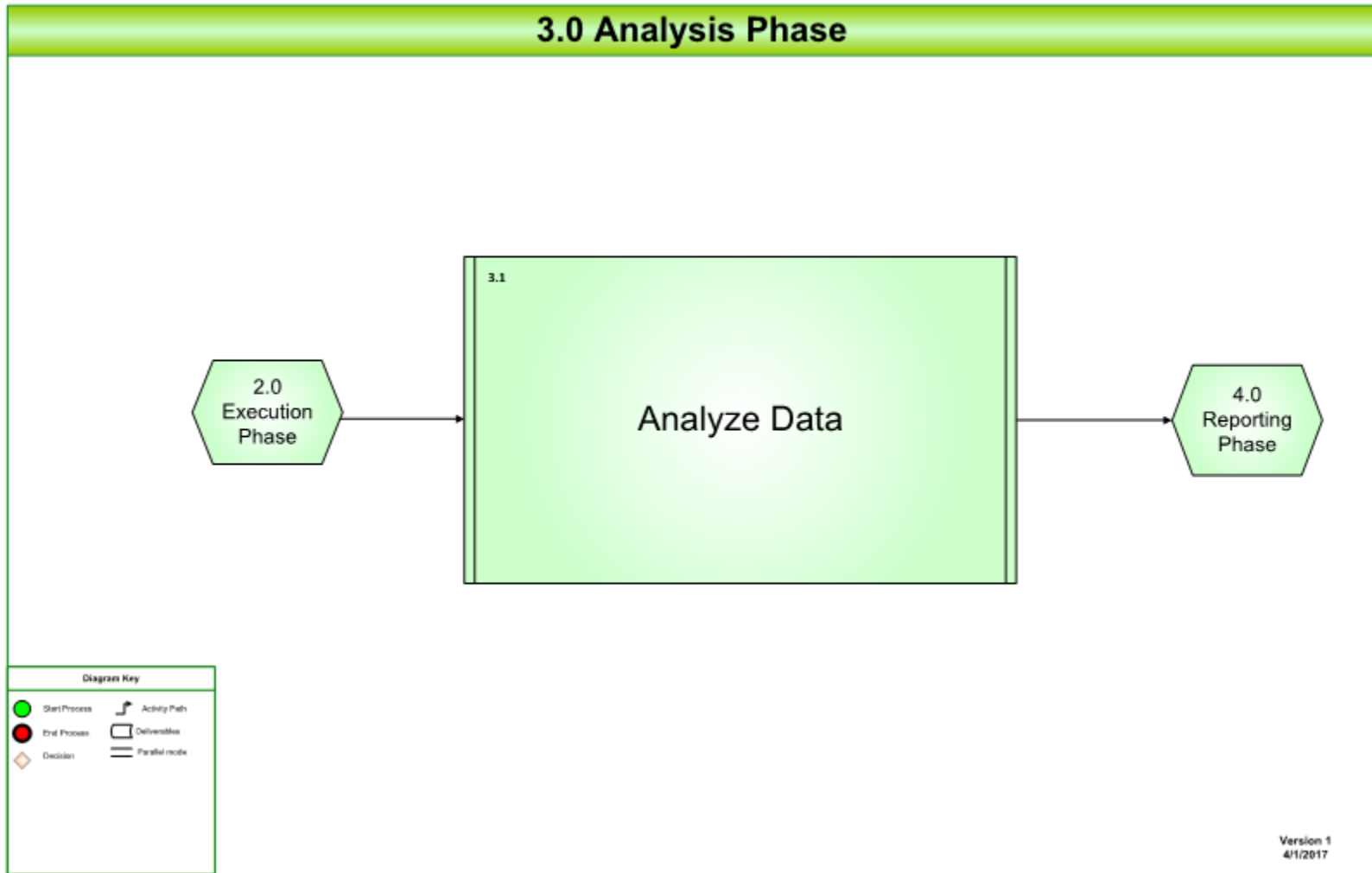- Naval Interoperability
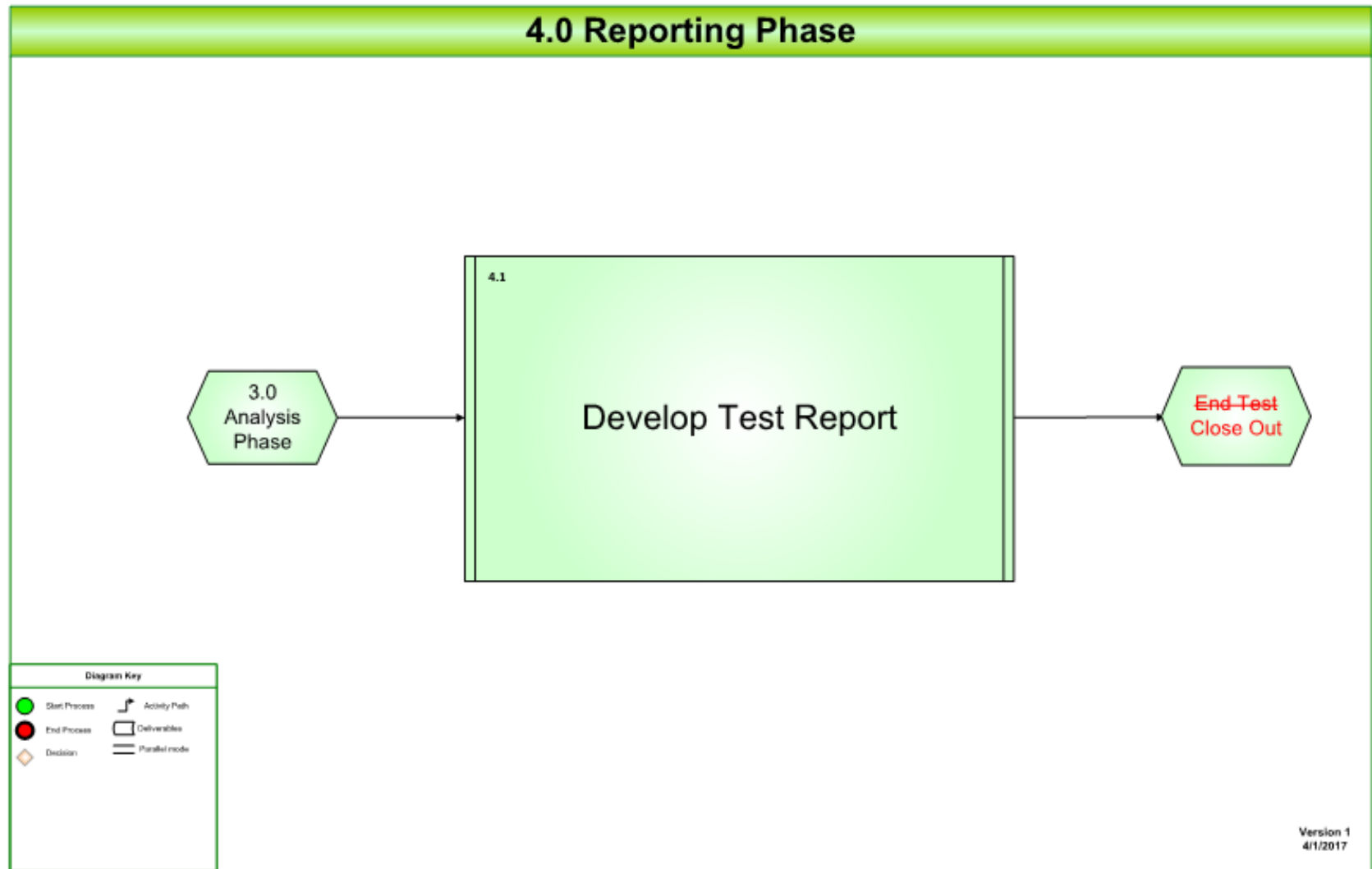- OV-1/SV-3 views

EXECUTION

2.0 Execution Phase

1.0 Planning Phase → **2.1 Conduct Daily Pre-Test Brief** → **2.2 Conduct Daily Test Event** → **2.3 Daily Debriefs** → **3.0 Analysis Phase**

Diagram Key

- ● Start Process
- ● End Process
- ◇ Decision
- ⌐ Activity Path
- ▭ Deliverables
- ═ Parallel mode

Version 1.0
4/1/2017

ANALYSIS

REPORTING

4.0 Reporting Phase

3.0 Analysis Phase → 4.1 Develop Test Report → End Test Close Out

Diagram Key
- Start Process
- End Process
- Decision
- Activity Path
- Deliverables
- Parallel mode

Version 1
4/1/2017

How We Test

We use several Scientific Test and Analysis Techniques (STAT) and tools to assist the test team.

- STAT (Design of Experiments (DOE), Observational Analyses, Hypothesis Testing, etc.)
- Automation
- Virtualization
- Simulation/Stimulation (SIM/STIM)
- Network Tools
- Analysis Tools

Why We Test

- **To find/prevent defects**
- **Find problems before they get fielded**
- **Enable informed decision making**

Ultimately – to **Make Marines More Capable**

Why We Test

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Why We Test

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CHALLENGES

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The majority of our testing challenges stem from lack of personnel with the following skill sets
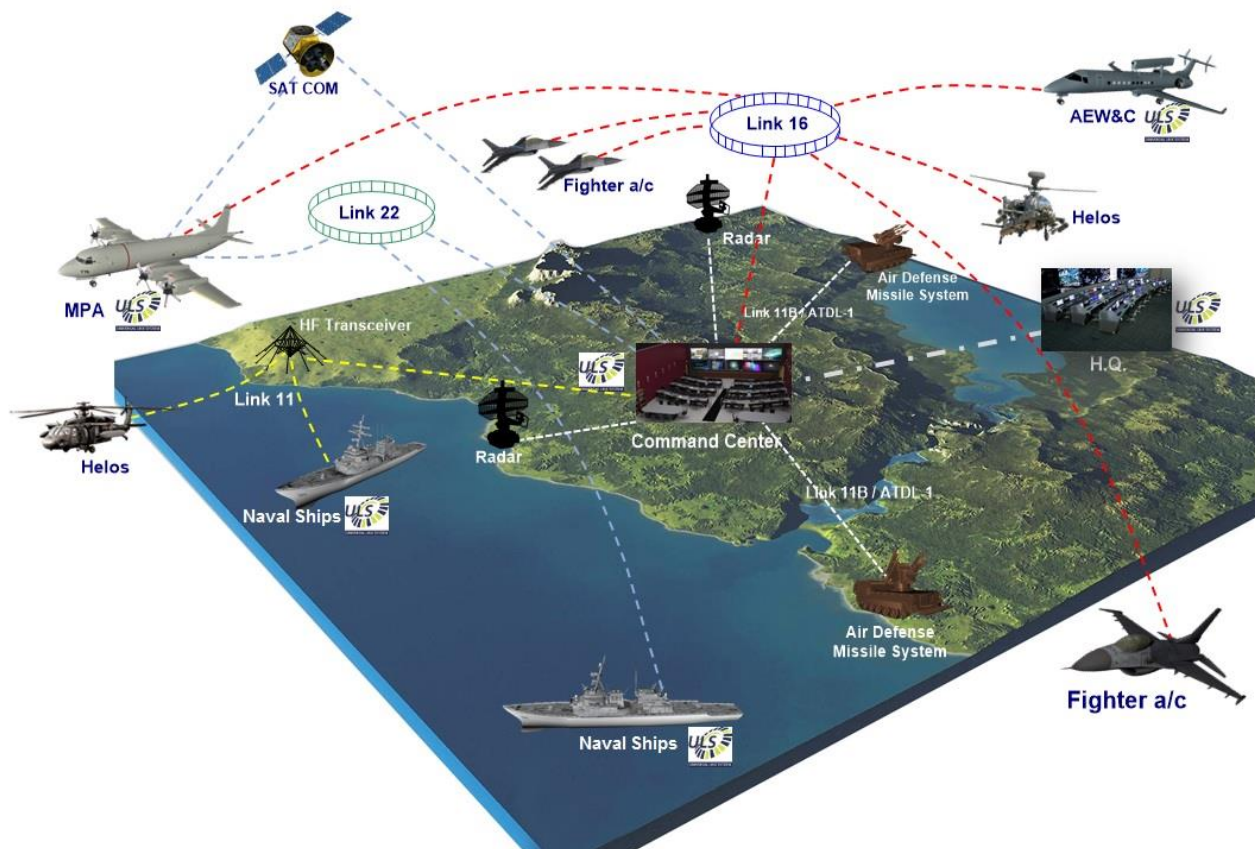
- Data/System Analysts (TDL Data, Sensor Data, Interface Data)

- System Operators (CAC2S, COC, MIDS, JRE, JTCW, AFATDS)

- Test Tool Operators (Network Tools, MLST3, DTS, GTE)

- Subject Matter Experts (MAGTF, Air Operations, Ground Operations)

CHALLENGES

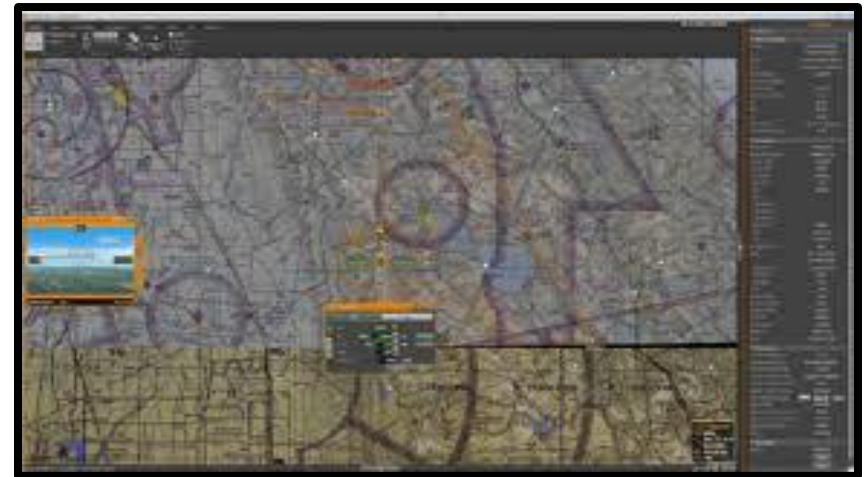## Data/System Analysts

(TDL Data, Sensor Data, Interface Data)

CHALLENGES

- **System Operators (CAC2S, COC, MIDS, JRE, JTCW, AFATDS)**

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CHALLENGES

- **Test Tool Operators (Network Tools, MLST3, DTS, GTE)**

CHALLENGES

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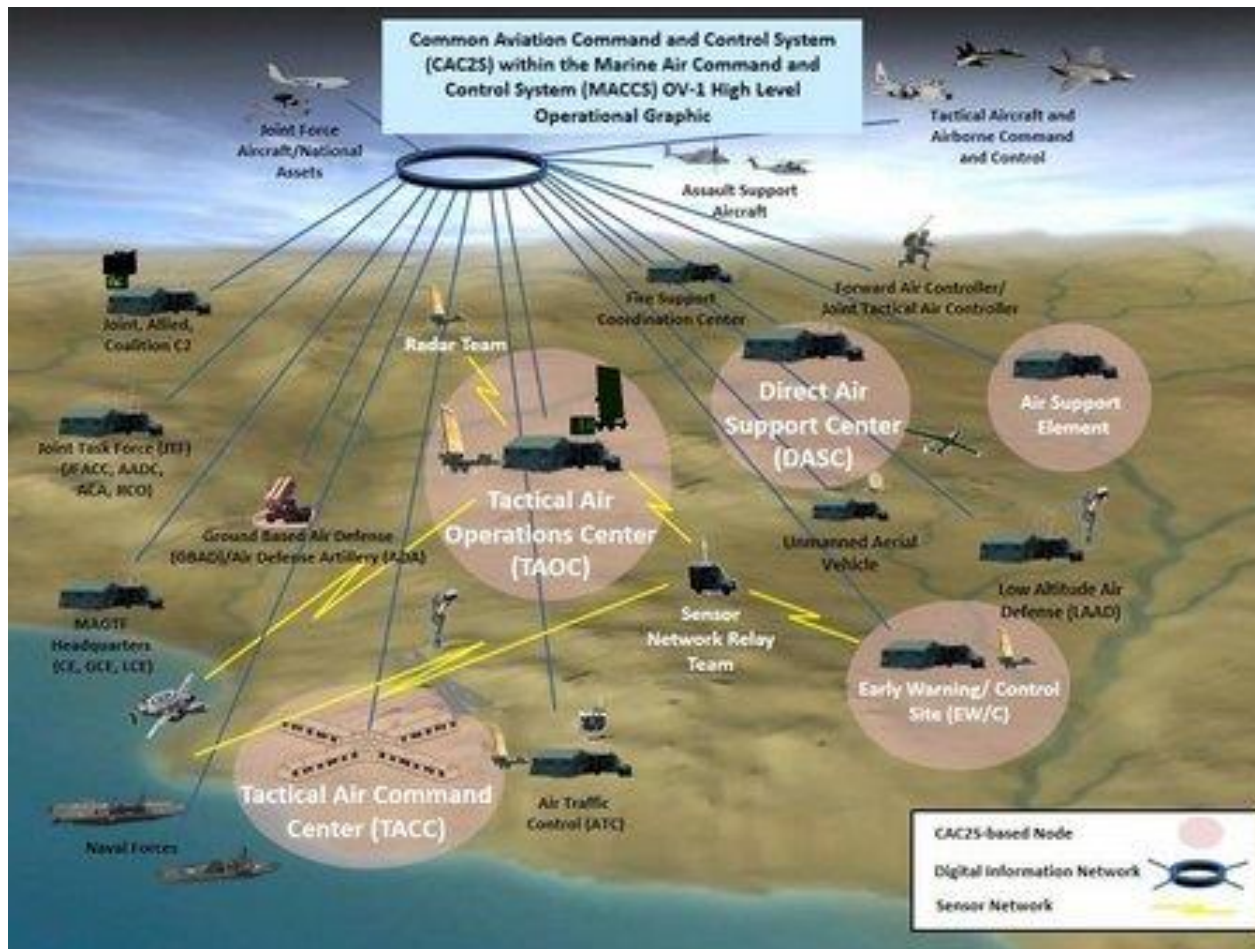
CHALLENGES

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CHALLENGES

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Summary

A test organization with operational relevance

- **What we test**
  - USMC Programs of Record

- **How we test**
  - MAGTF SIE
  - PEAR Processes
  - STAT

- **Why we test**
  - Make Marines More Capable

- **Challenges**
  - SMEs (MAGTF, Air, and Ground Operations)
  - Data/System Analysts
  - System and Test Tool Operators