Proposed Systems Engineering Processes for the Integrated Live, Virtual, and Constructive (LVC) Test Environment (ILTE)

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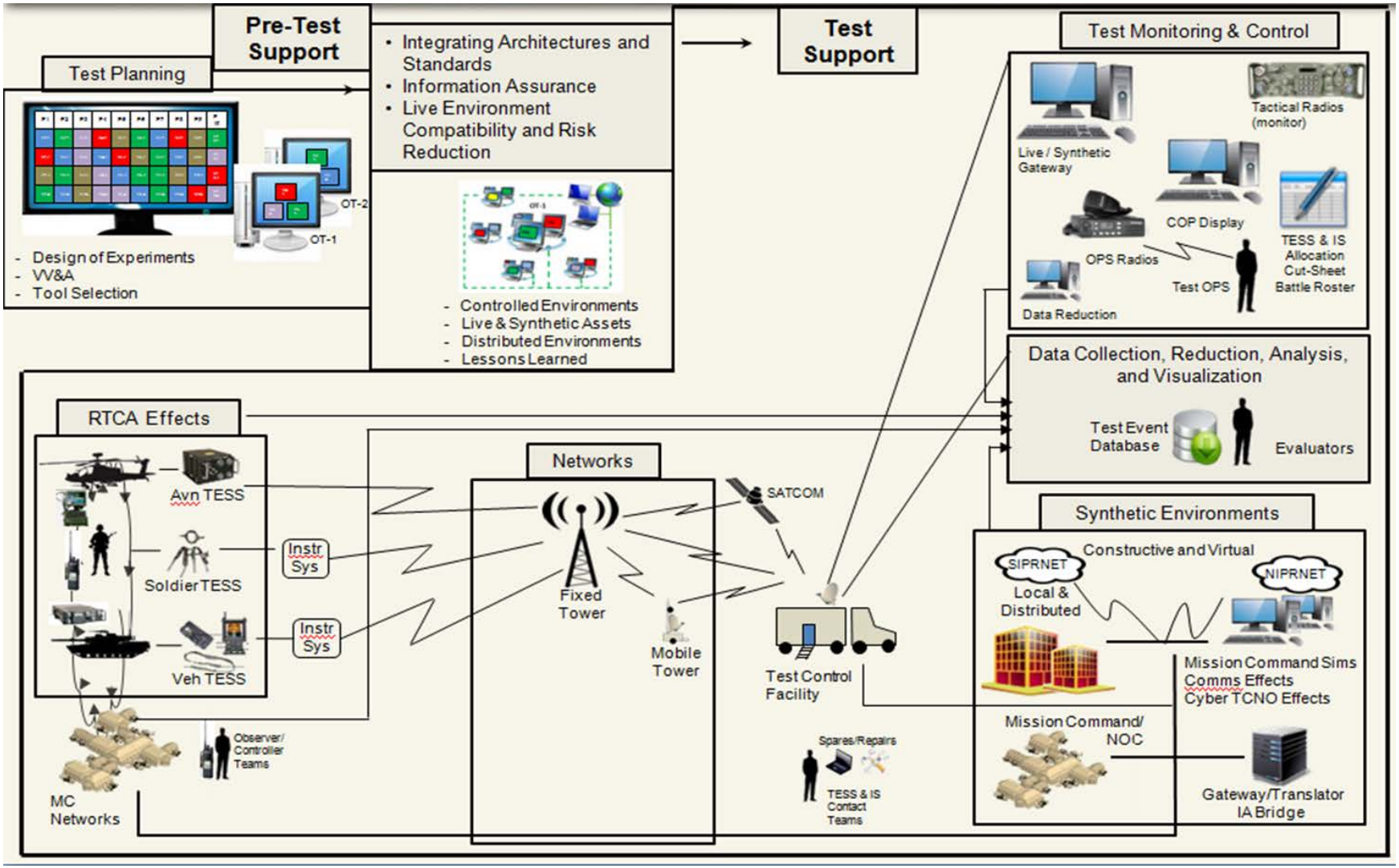
ILTE Requirement Background

- **Integrated Live, Virtual, and Constructive (LVC) Test Environment (ILTE) is a new acquisition program that Program Executive Office Simulation, Training, and Instrumentation (PEO STRI) is initiating in FY15**
- **US Army Operational Test Command (OTC) is the ILTE Capability Developer and PEO STRI is the ILTE Materiel Developer.**
- **ILTE Requirements are documented in the ILTE Test Capability Requirements Document (TCRD)**
- **OTC requires ILTE capabilities to create a realistic test environment for Army Systems undergoing Operational Test**
- **This briefing describes an eleven step process that MITRE proposed to PEO STRI to initialize Build 0 of the ILTE System of Systems**

ILTE OV-1



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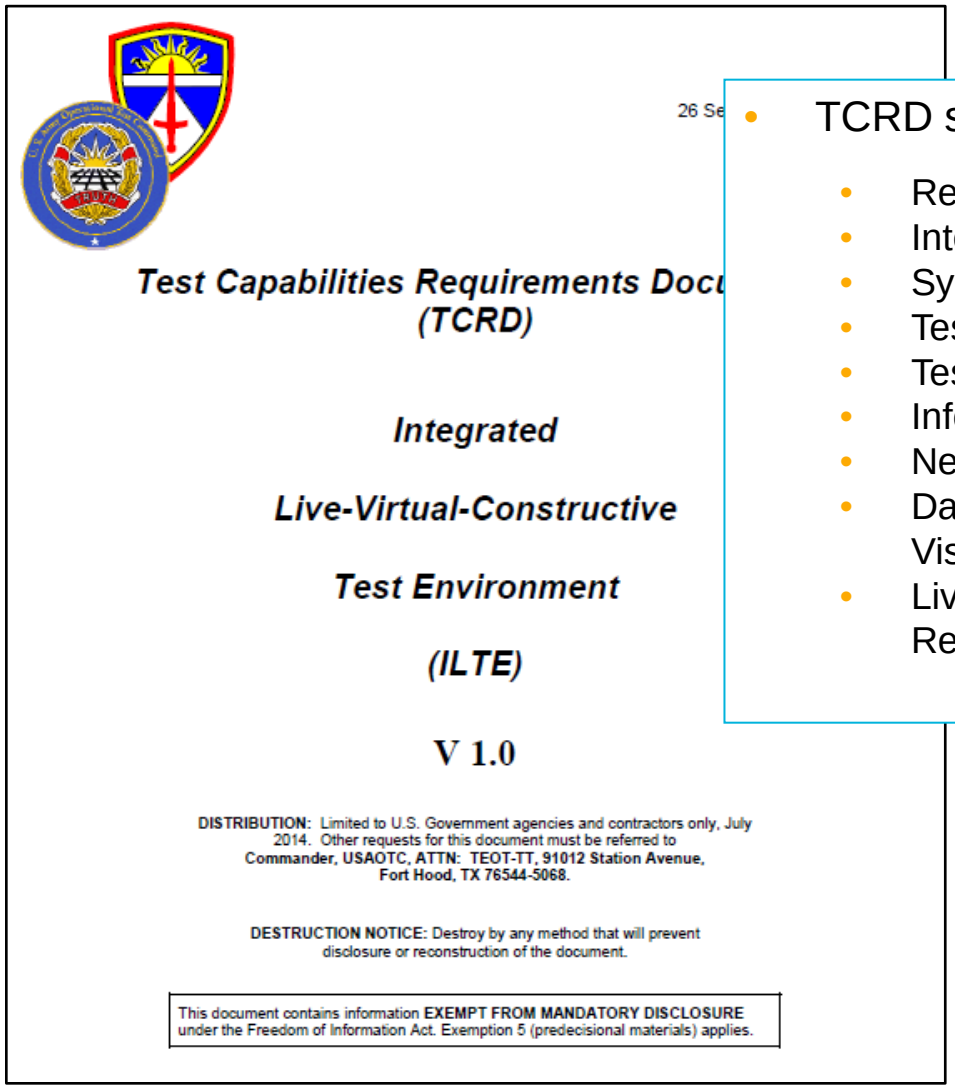
ILTE Build 0 Initialization Process

	Process Step	Description
1	**Define ILTE Scope and Purpose**	Describe actions to define initial, overarching ILTE scope and purpose.
2	**Identify ILTE Initial Components**	Identify and trace ILTE components to be included in initial offering.
3	**Define ILTE Current Capabilities**	Decompose ILTE systems defined in [2] into functional capabilities.
4	**Analyze ILTE Capability Objectives**	1st round of iterative process to examine and measure current ILTE capabilities against TCRD requirements and determine what potential capabilities can be reached in near term cycles.
5	**Define Initial ILTE Implementation Plan**	Create development, integration, functional test, certification, and deployment plan for 1st round ILTE components.
6	**Capture Existing ILTE Architectural Components**	Conduct actions and activities to establish configuration control and management of ILTE components. Plan and manage deployments.
7	**Establish ILTE Development and Integration Facilities**	Conduct actions and activities to establish facilities and resources necessary for effective, on-going ILTE integration, test, and deployment preparation.
8	**Establish ILTE Planning Cycle**	Compare current with future requirements. Prioritize and schedule future increments.
9	**Define/Establish Working Groups**	Working groups needed and their expected role on ongoing ILTE efforts.
10	**Requirements Analysis, Management, and Tracking**	Process for on-going requirements analysis, management, and tracking.
11	**First-Use (V 1.0) Integration Plan & Schedule**	Specific plan for V 1.0 first test event.

ILTE Phase 0 Initialization
Step 1. Define ILTE Scope and Purpose



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Test Capabilities Requirements Docu
(TCRD)

Integrated

Live-Virtual-Constructive

Test Environment

(ILTE)

V 1.0

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- TCRD specifies capabilities required:
  - Real-Time Casualty Assessment Effects
  - Integrating Architectures & Standards
  - Synthetic Environments
  - Test Planning
  - Test Monitoring & Control
  - Information Assurance
  - Networks
  - Data Collection, Reduction, Analysis, and Visualization.
  - Live Environment Compatibility and Risk Reduction

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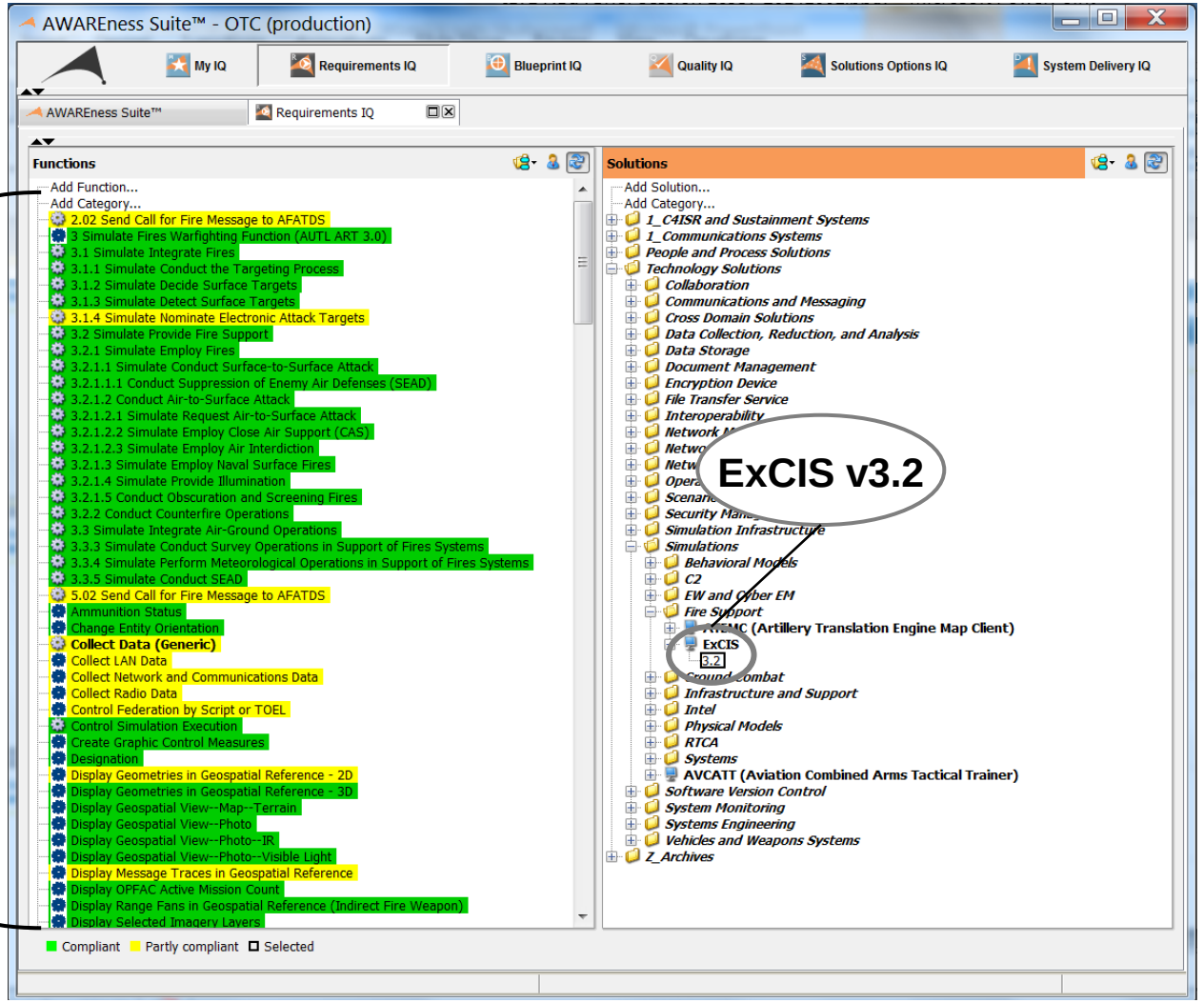
ILTE Phase 0 Initialization
Step 2. Baseline Initial Systems

Name	Acronym	Description
Intelligence Modeling and Simulation for Evaluation	IMASE	Simulation: IMASE is an entity-based, stochastic (random), event stepped computer simulation. It supports ISR and IEW system development, training, and testing using a threat-based, multispectral environment.
Extensible C4ISR Instrumentation Suite Fire Support Application	EXCIS FSA	Simulation: ExCIS FSA was developed to simulate fire support command and control systems.
Common Data Link	CDL	An OTC application that serves as the central command and interface for multiple components, including cross-service instrumentation systems, that together provide a Joint Real-Time Casualty Assessment (JRTCA) capability. CDL processes geospatial data, weapon engagements, and casualty assessments.
Multiple Integrated Laser Engagement System	MILES	MILES is used by US military and other armed forces for training. It uses lasers and blank cartridges to simulate actual battle.
The ATEC Player Event Tracking System	TAPETS	MILES add on used to provide position / location information and communications
Joint Tool Suite	JTS	Collection of tools developed by EPG, used for data collection, reduction, storage, analysis, visualization, simulation and stimulation of select Army systems. Formerly known as (RICS)2
Advanced Distributed Modular Acquisition System	ADMAS	Communications, video, and network data collection device suitable for soldier systems, general C4ISR applications, UxV, Wheeled/Tracked Vehicles, Air platforms, etc.
One Semi-Automated Forces	OneSAF	OneSAF is a composable, next generation, entity-level Computer Generated Forces (CGF) simulation for brigade and below, combat and non-combat operations.

ILTE Phase 0 Initialization
Step 3. Define ILTE Current Capabilities

- Functional Decomposition of **existing systems** to standard function list
- Relative Degree of coverage of function indicated by matching of inputs/outputs to function
- Tool (AWAREness) allows multiple mapping of systems to functions



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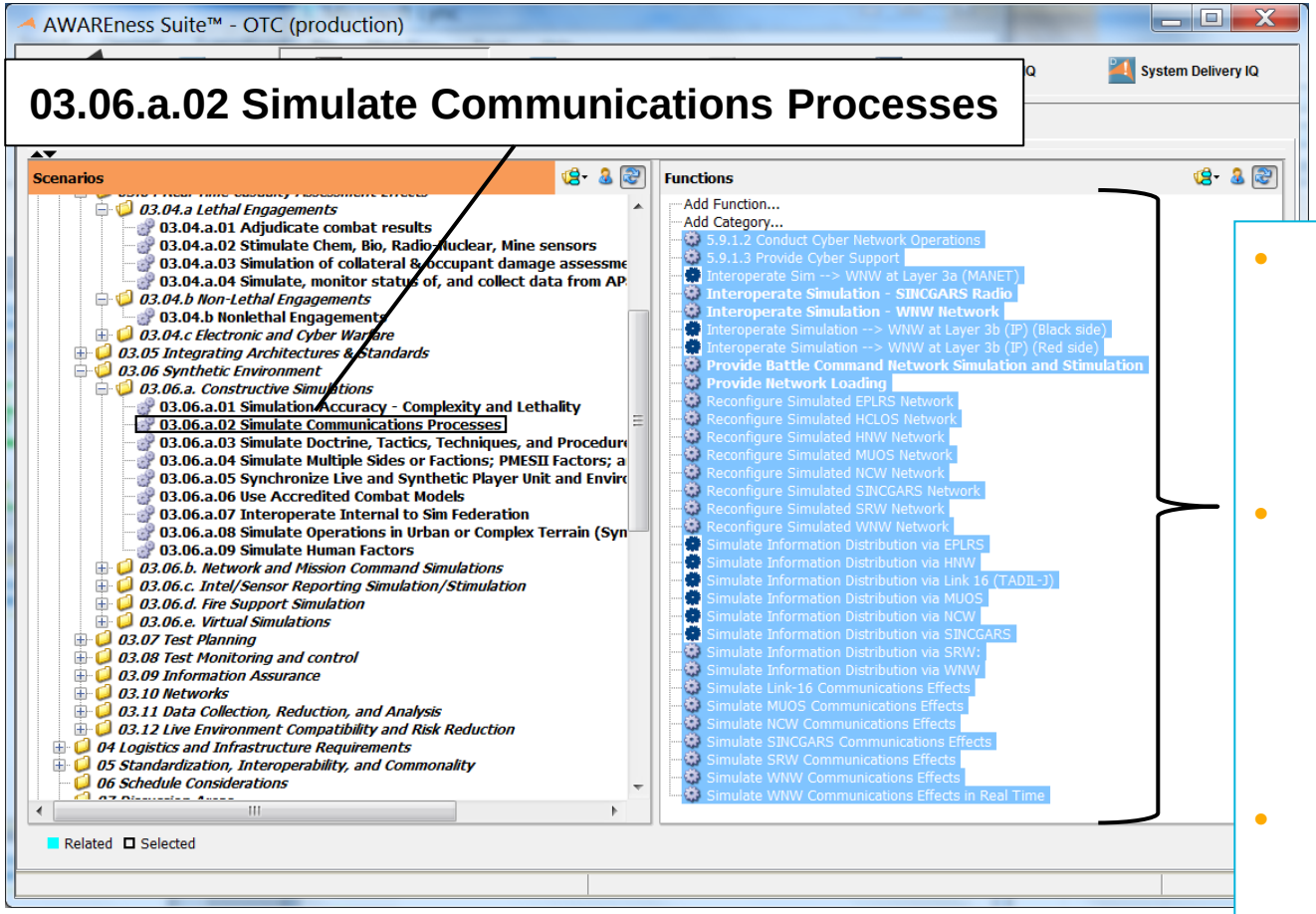
Section II. ILTE Phase 0 Initialization
Step 4. Analyze ILTE Capability Objectives



- Functional Decomposition of **required capabilities** to standard function list
- Allows on-going progress monitoring of SoS development against objective capabilities
- Tool (AWAREness) allows multiple mapping of requirements to functions

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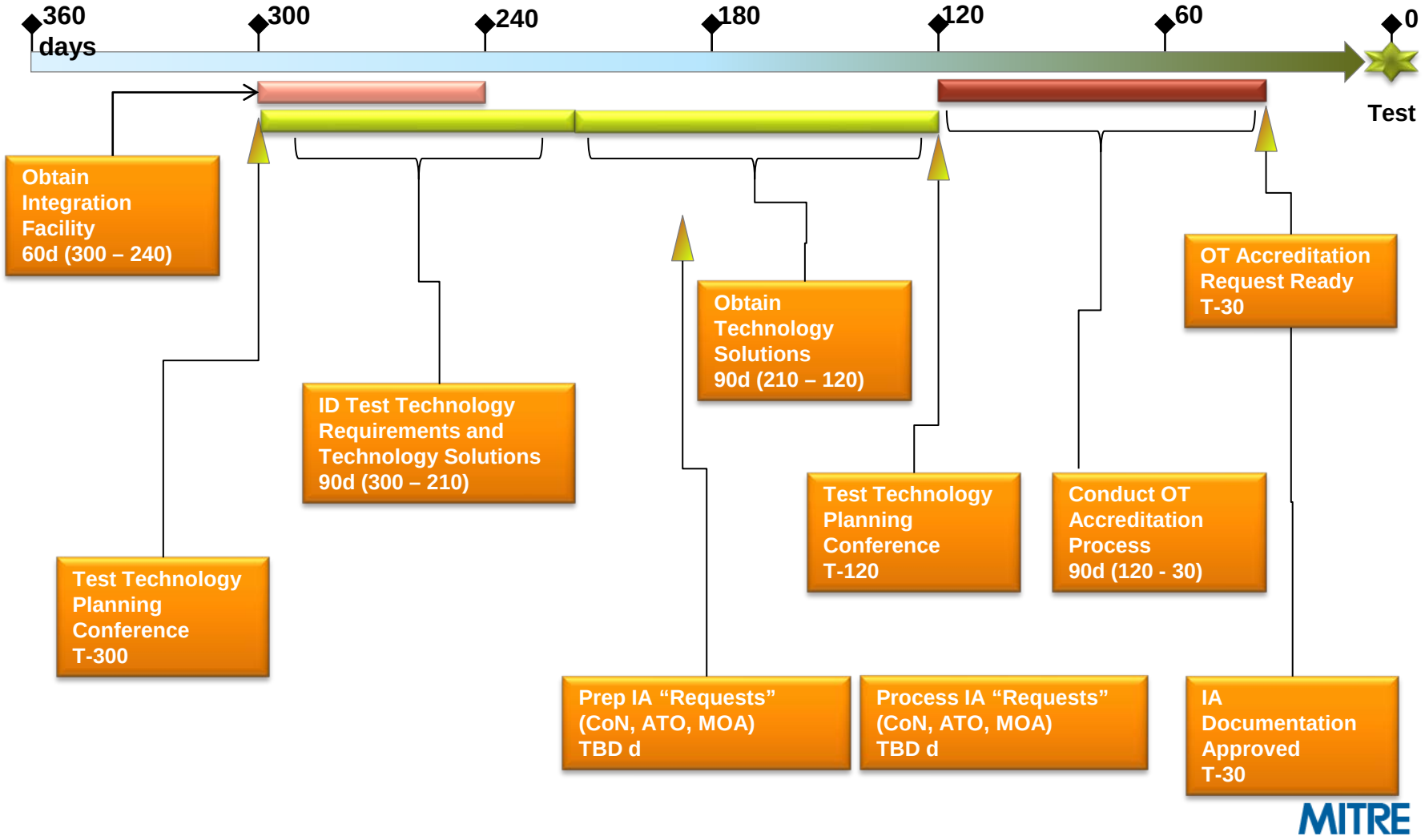
ILTE Phase 0 Initialization
Step 5. Initial ILTE Implementation Plan

Notional ILTE Test Technology Preparation Process



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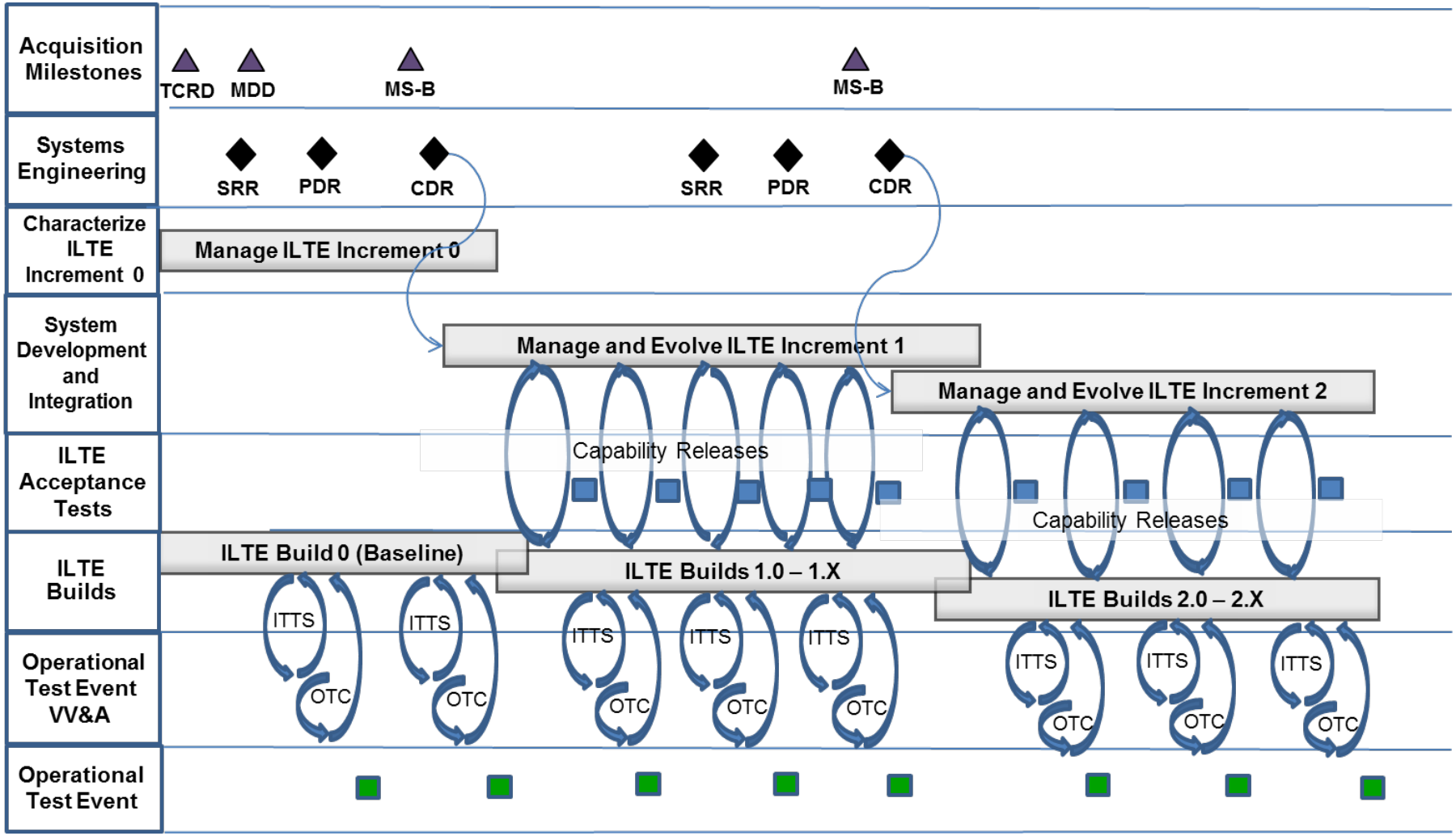
ILTE Phase 0 Initialization
Step 6. Capture Existing ILTE Architectural Components

- **Includes the following activities**
  - Capture Proposed ILTE Component Systems
  - Capture ILTE Interoperability and Support Mechanisms
  - Capture ILTE Interchange Data
  - Capture Known/Test Data Exchange Patterns
  - Capture ILTE Common / Shared Services
  - Establish ILTE CM Process and CCB

ILTE Phase 0 Initialization
Step 7. Establish ILTE Development and Integration Facilities

- **Baseline Network Path**
  - Checklist of the contents (the subsystems)
  - What documents we want on each subsystem
  - Connectivity diagrams
    - Includes Mission Command connectivity
    - Distributed protocols
  - Other user identification
  - Power, Operating System, 32/64 bit function, CON status
  - Hardware demands for each
  - Owners for each
  - Contracts available to leverage for each

ILTE Phase 0 Initialization
Step 8. Establish ILTE Planning Cycle



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ILTE Phase 0 Initialization
Step 9. Define and Establish Working Groups

«Pool»:SoSET «Lane» Govt SE «Lane» Non-Govt SE	The ILTE SoS Engineering Team (SoSET) provides independent systems engineering and architecture management on the behalf of all of the other ILTE SoS stakeholders. The SoSET is managed by PM ITTS and may be composed of both Government and non-Government Systems Engineering staff.
«Pool»:ILTE CCB	The ILTE Configuration Control Board (CCB) will be composed of Government sponsor representatives of User community (OTC) and Material Developer (PM-ITTS). It is the ILTE decision making body responsible for: • Decisions on what components will be accepted for inclusion into ILTE SoS • Decision approval for modifications to existing ILTE SoS
«Pool»:Testers	The ILTE Integration and Test (I&T) Team (Testers) are those responsible for conducting and supporting the periodic ILTE I&T events. This team may be composed of ILTE SE team members, PM-ITTS contractors, or test site support staff.
«Pool»:Fielders	The ILTE Deployment Management Team (Deployers) are those responsible for conducting and supporting the periodic ILTE fielding events. These events include receipt of ILTE components from baseline storage, performing V&V certification for operational test, and deployment to multiple sites where ILTE components will be used to conduct operational tests. This team may be composed of ILTE SE team members, OTC contractors, or test site support staff.
«Pool»:Users	The ILTE User Community (Users) represents the OTC Test Officers who will rely upon the capabilities of the ILTE SoS to support their Operational Tests.
«Pool»:Developers	ILTE Software/Hardware (Developers) includes the Government and non-Government organizations involved with ILTE development. This group will be managed by PM-ITTS, who will be responsible for interfacing directly with other Government organizations which may represent their contractor developers.

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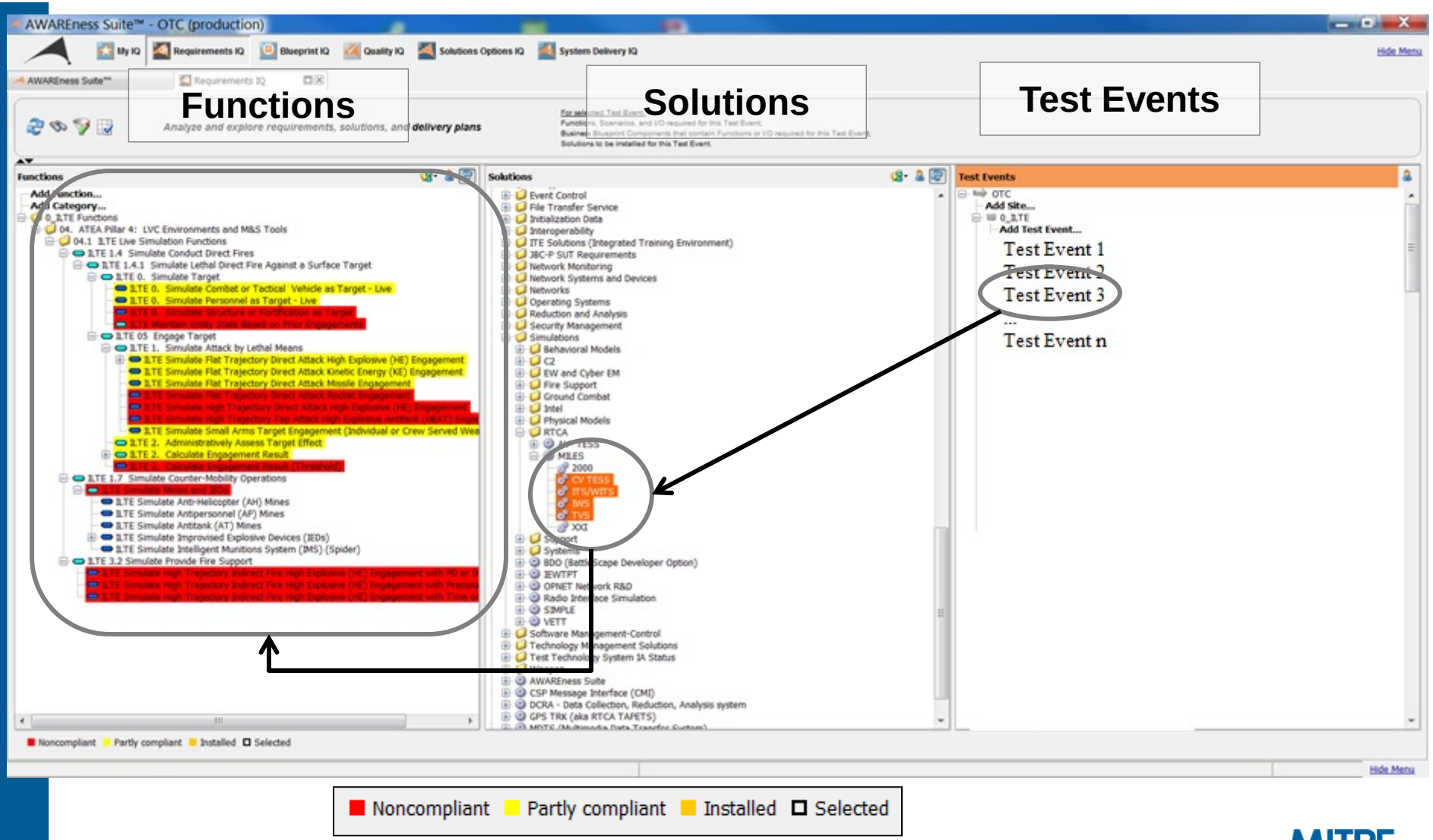
ILTE Phase 0 Initialization
Step 10. Requirements Analysis, Management, and Tracking



ILTE Phase 0 Initialization
Step 11. First Use (V 1.0) Integration Plan and Schedule

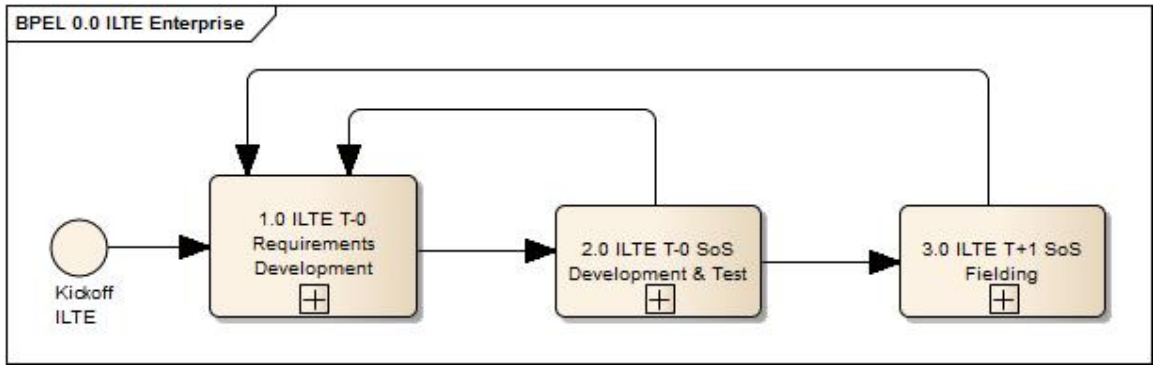
- **Candidate tests down selected from OTC FY-15 test schedule**
  - 5 potential selections made based on initial components
  - 1 target operational test made for Q2 FY16

- **Issues to be considered**
  - Building relationship with OTC Test Officers
  - Fluidity of System(s) delivery
  - Fluidity of Operational Test schedule

- **ILTE Work to be done**
  - Establish / Improve interoperability of existing components
  - Establish / Improve performance metrics for on-going measurement

ILTE Lifecycle Management
Repeated SoSE Actions to Evolve ILTE SoS

- Document, refine, and prioritize future ILTE SoS needs
- Identify, evaluate, and select design option(s) for addressing ILTE SoS needs
- Develop and manage the ILTE SoS architecture
- Synchronize and develop ILTE SoS updates (system)
- Integrate and test ILTE SoS updates
- Conduct ILTE Deployment Acceptance tests
- Package and Roll-out ILTE SoS update



End of Presentation

- Questions?

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