

# Agile Test & Evaluation



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Administration

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Weather Services Verification Branch, ANG-E67

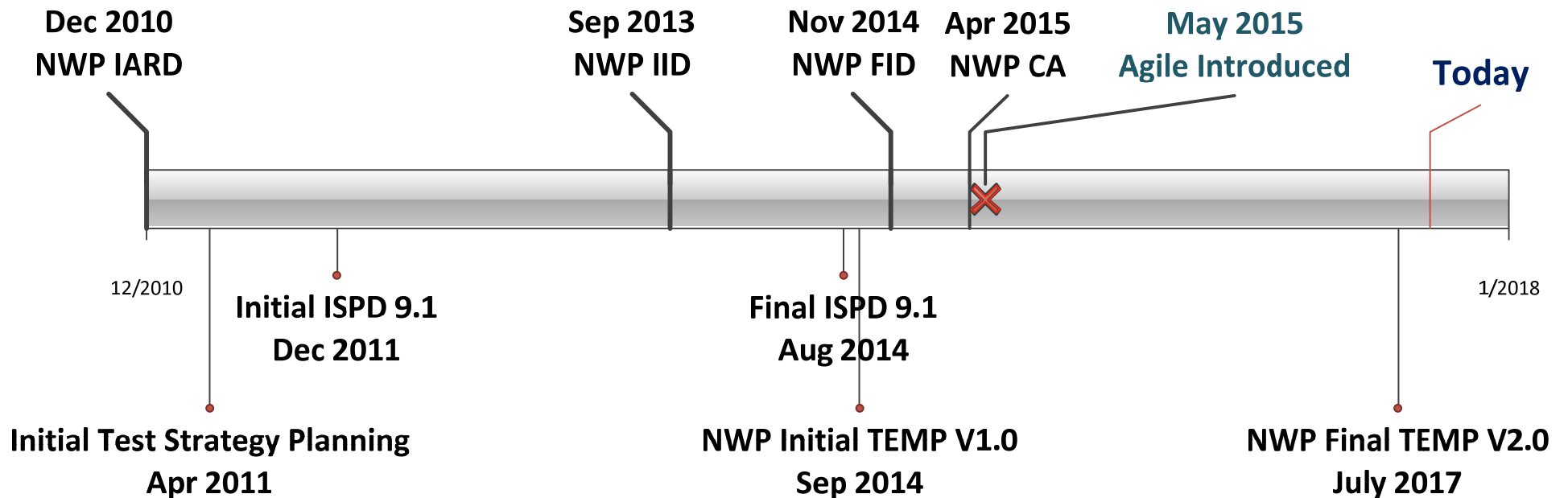
Date: September 13, 2017

# Purpose

- **The purpose of this briefing is to present the Agile Test & Evaluation Strategy currently being used to support an FAA NextGen Weather program.**



# Background



IARD: Investment Analysis Readiness Decision  
 IID: Initial Investment Decision  
 FID: Final Investment Decision  
 CA: Contract Award

ISPD: Implementation Strategy & Planning Document  
 TEMP: Test & Evaluation Master Plan



# Background

- **T&E Handbook – NWP Initial TEMP V1.0**
  - No Agile T&E Guidance at the time
- **T&E Handbook Now**
  - 6.1.1.1 AGILE ACQUISITION IN AMS

“The FAA may use Agile acquisition practices to accelerate the deployment of capabilities and to ensure that capabilities exhibit greater user acceptance and operational value.”



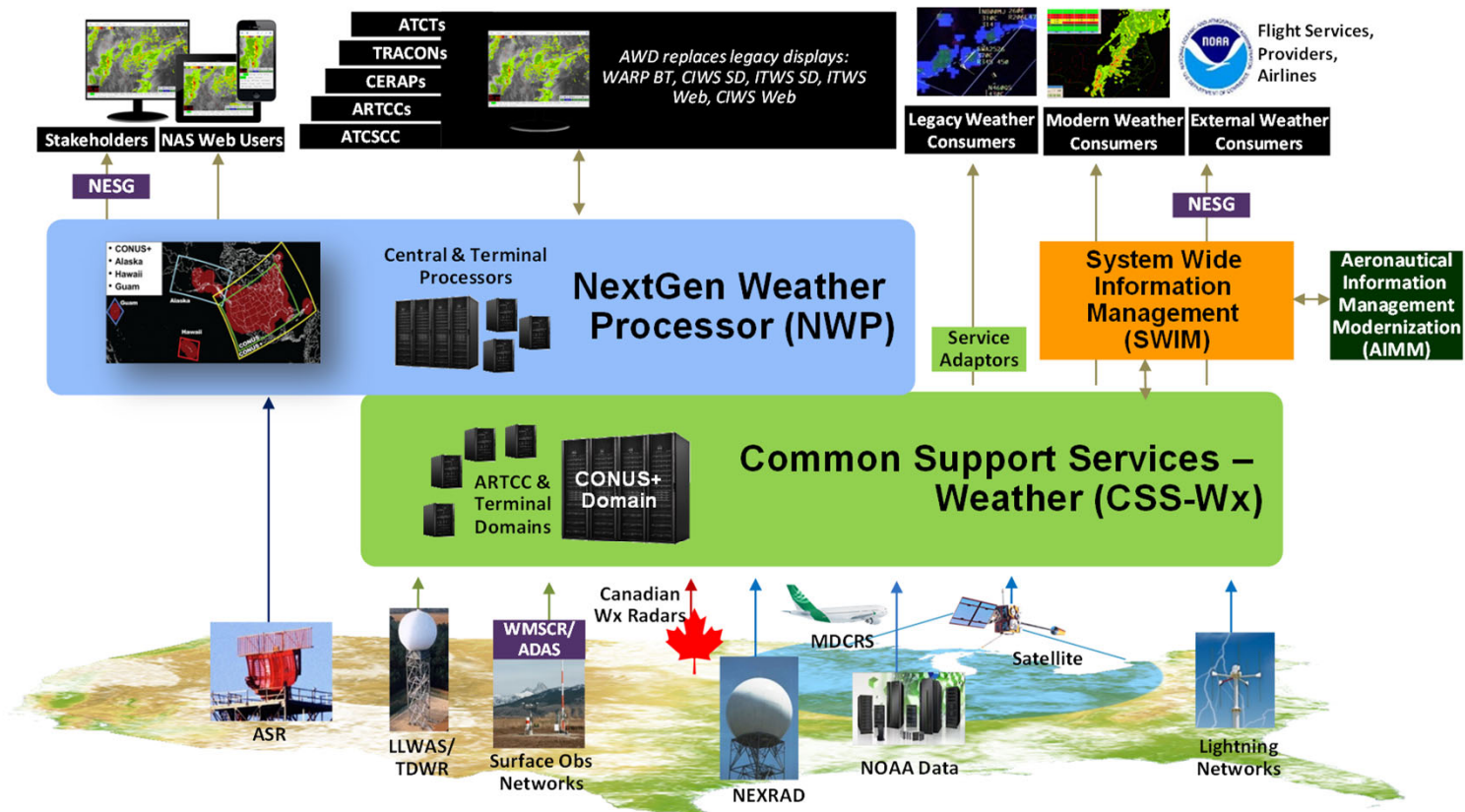
# Background

- **T&E Handbook Now - continued**
  - 6.1.1.1 Agile Acquisition in AMS - continued

“The AMS includes two guidance documents: *FAA Agile Acquisition Principles and Practices* and *Agile Program Management Practices for the FAA*. For acquisitions adhering to this framework, it is important for test practitioners to become familiar with Agile acquisition terminology and definitions.”

# Current Weather Program

## NextGen Weather Systems Architecture



# NWP Test Program

- **Development Test**
  - Functional Qualification Tests (FQTs)
  - Factory Acceptance Test (FAT)
  - Integration Test\*
  - System Test\*
  - Production Acceptance Test (PAT)
  - Site Acceptance Tests (SATs)
  - Regression Test

\* Conducted at WJHTC



# NWP Test Program – continued

- **WJHTC Agile Integration Risk Reduction Test**
  - Integration
  - Meteorological Evaluation
  - Early User Evaluations



# NWP Test Program – continued

- **Operational Test**
  - Conduct OT at FAA Technical Center (WJHTC)
  - Conduct OT Key Sites
- **Field Familiarization**
  - Support Site/Facility Level Tests
- **Independent Operational Assessment**
  - Support IOA



# TRADITIONAL TEST & EVALUATION STRATEGY

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# Traditional T&E Strategy

- **Development Test (DT)**
- **Operational Test (OT)**
- **Key Site Test (KST)**
- **Field Familiarization (FF)**
- **Independent Operational Assessment (IOA)**



# Traditional T&E Strategy (continued)

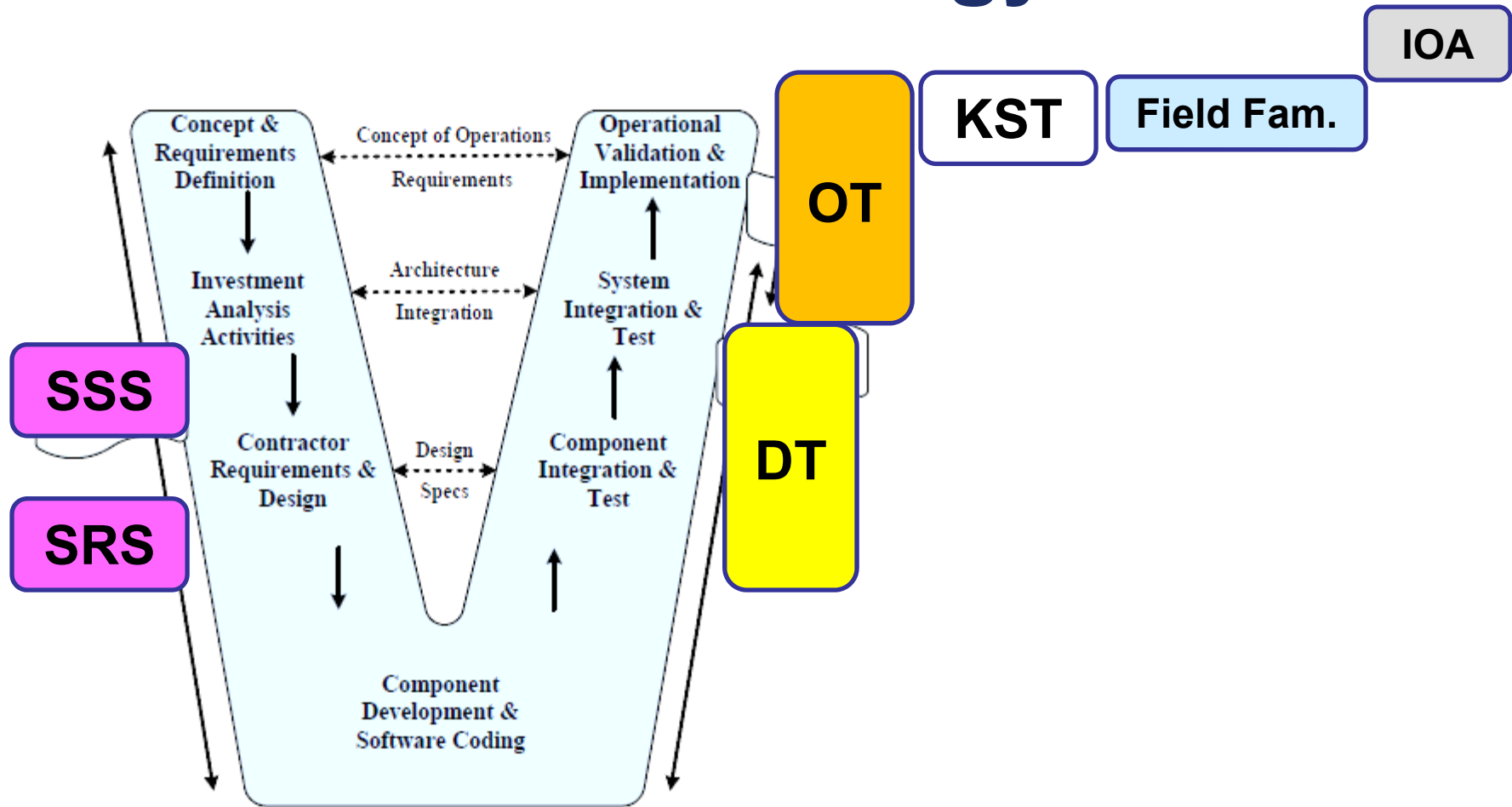


FIGURE 1-1. T&E APPLICATION TO THE V-MODEL

*\*from T&E Handbook, VVSPT-A2-PDD-013 v3.0, 9-24-2013; pg 1-2*

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**Previous Results**

# **AGILE T&E STRATEGY**

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# Agile T&E Strategy – Previous Results

- **Verification Activities Prior to Formal Test**
  - COTS/NDI Verification
  - Open Source Software (OSS) Verification
  - Software Verification
  - Hardware Verification
- **Pre-requisite To Enter Development Test**



# Agile T&E Strategy – Previous Results

- **Software Verification - Informal**
  - New and Modified Software Items (CSCIs, CSCs)
  - FAA Monitors Contractor Software Verification
  - Contractor follows incremental framework of Agile processes: Software Development, System Engineering
  - Informal Testing: Unit Test, Module Test and Preliminary Qualification Test
  - PQT establishes software meets SRS-level requirements
  - PQT is conducted when software feature is Done.



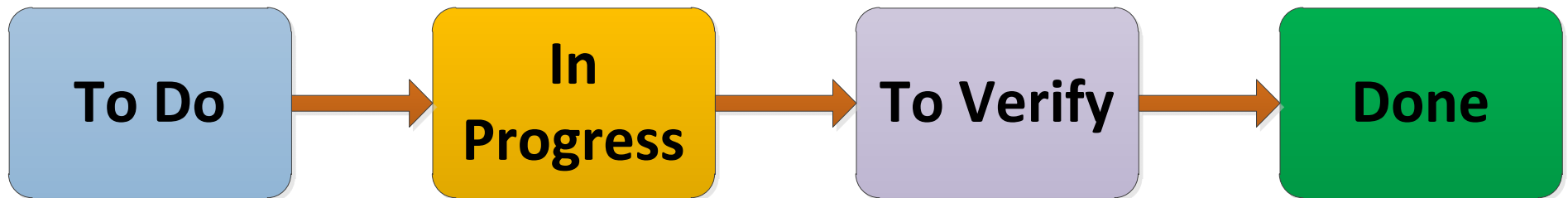
# Agile Test Strategy – Agile Scrum

## Agile Scrum Process



# Agile T&E Strategy - Sprint

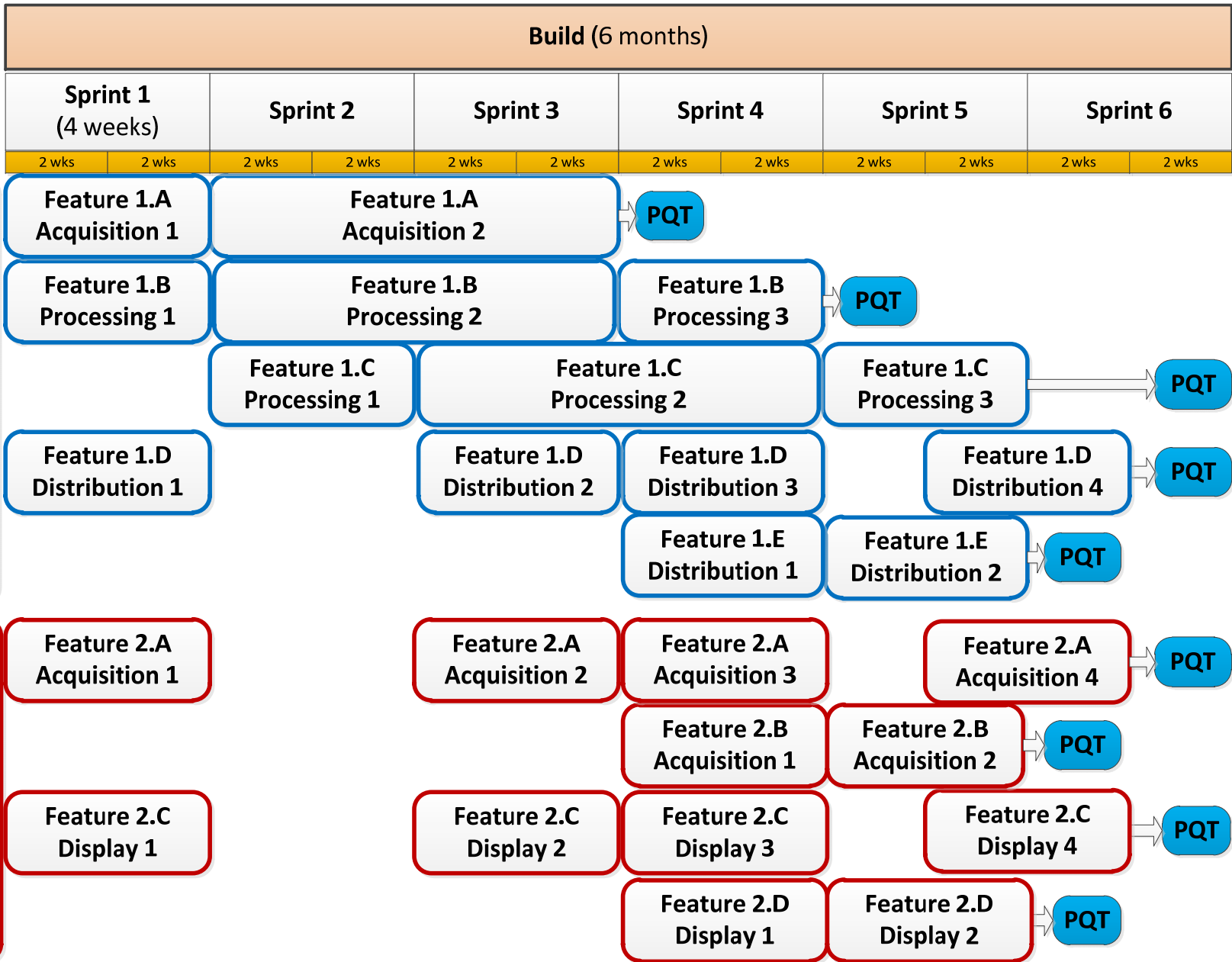
- **Product Backlog to Sprint Backlog**
- **Feature Development to Deliverable**
- **Feature/Deliverable Status**



# Example: Previous Results

- **Agile Software Development**
  - One Build, Six Sprints
  - Nine Features
  - Nine PQTs
  - Nine 'Done' Software Features





**Development Test**

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# Agile T&E Strategy – Development Test

- **Development Test**
  - Functional Qualification Tests (FQTs)
  - Factory Acceptance Test (FAT)
  - Integration Test\*
  - System Test\*
  - Production Acceptance Test (PAT)
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  - Regression Test

\* Conducted at WJHTC



# Agile T&E Strategy - FQT

- **Each Build – Formal Test - FQT**
  - FQT Test Plan and VRTM
  - FQT Test Procedures
  - FQT Test Readiness Review
  - FQT Test Conduct
  - FQT Test Report
- **FAA Interim Assessment Report (IAR)**

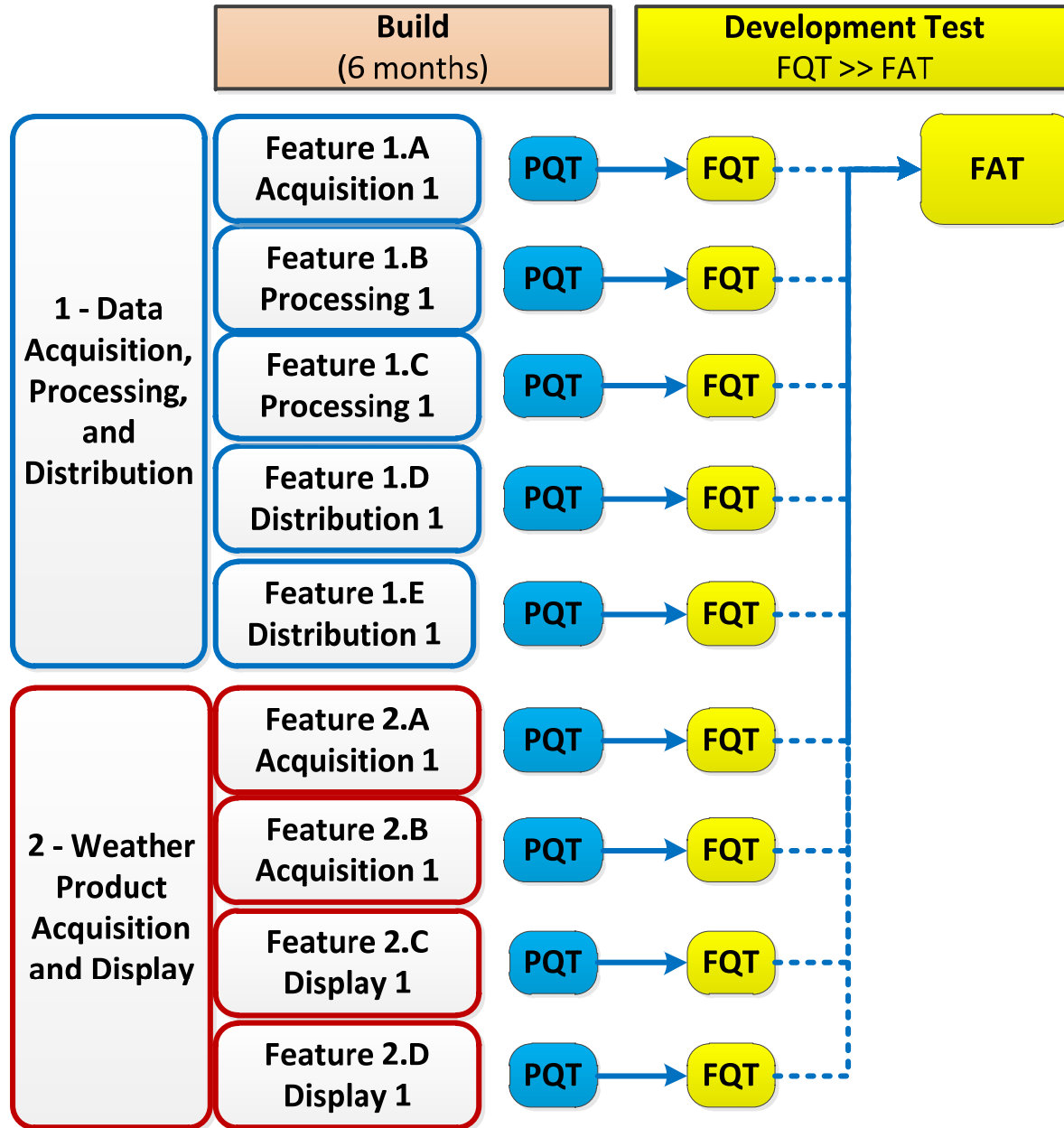


# Example:

## Functional Qualification Test

- **Example shows Previous Test results from PQT leading into the first formal testing of Development Test: FQT.**





# Requirements – Level of Test

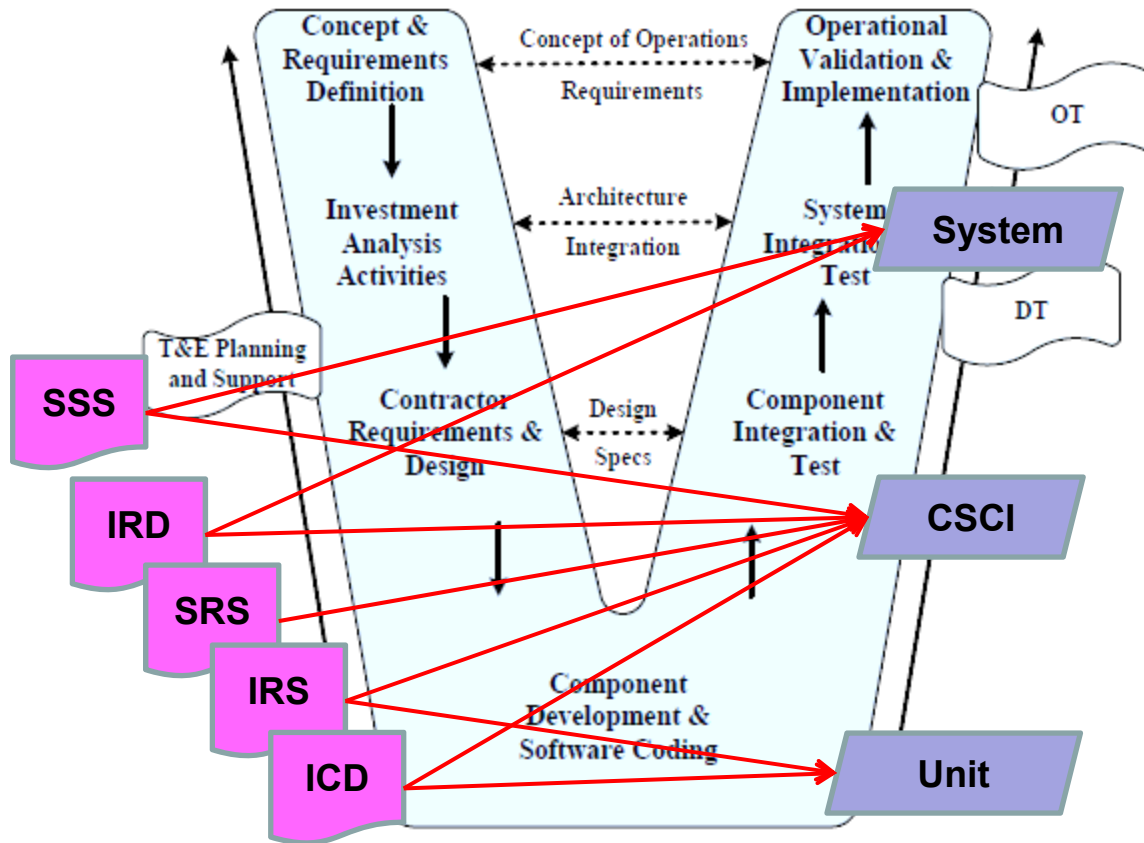


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# Contractor Testing

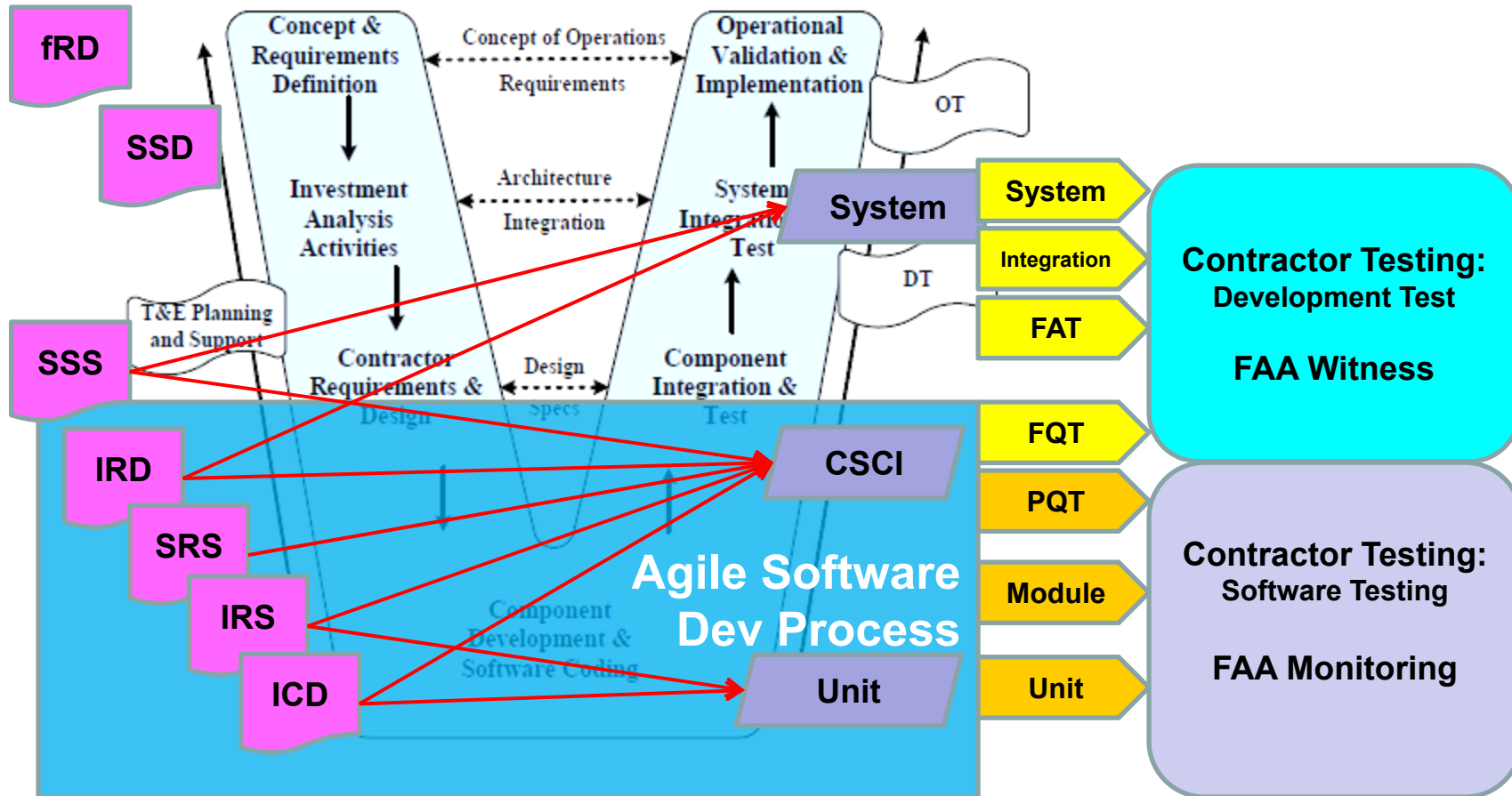


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**WJHTC Agile Integration Risk Reduction**

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# Agile Integration Risk Reduction

- **FAA as Integrator of Systems**
- **WJHTC Agile Integration Risk Reduction (WAIRR) Test**
  - Integration Test
  - Meteorological Evaluation (MetEval)
  - Early User Evaluation (EUE)
- **Leverage WAIRR Test for Operational Test**



**Operational Test, Key Site, Field Familiarization, IOA**

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# Agile T&E Strategy

- **Operational Test**
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  - Conduct OT Key Sites
- **Field Familiarization**
  - Support Site/Facility Level Tests
- **Independent Operational Assessment**
  - Support IOA



# QUESTIONS

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