Joint Modeling and Simulation System
Briefing to
Defense Modeling and Simulation
Industry Days 2000

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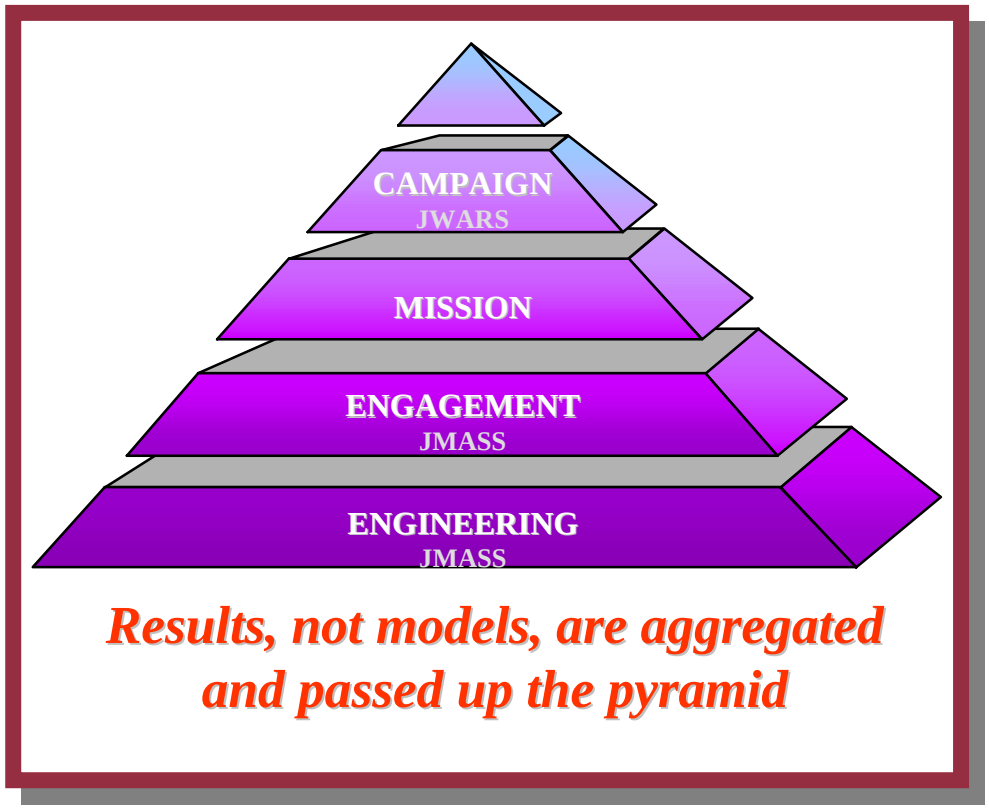
JMASS Program Manager

Date: 24 May 00

Overview

- **Background**
- **Current Status & Activities**
- **Where Are We Headed?**
- **Summary**

Levels of Analysis



Campaign: Force structure studies based on multi-day many-on-many scenarios

Mission: System trade-off studies based on tailored scenarios, and fewer, more detailed systems

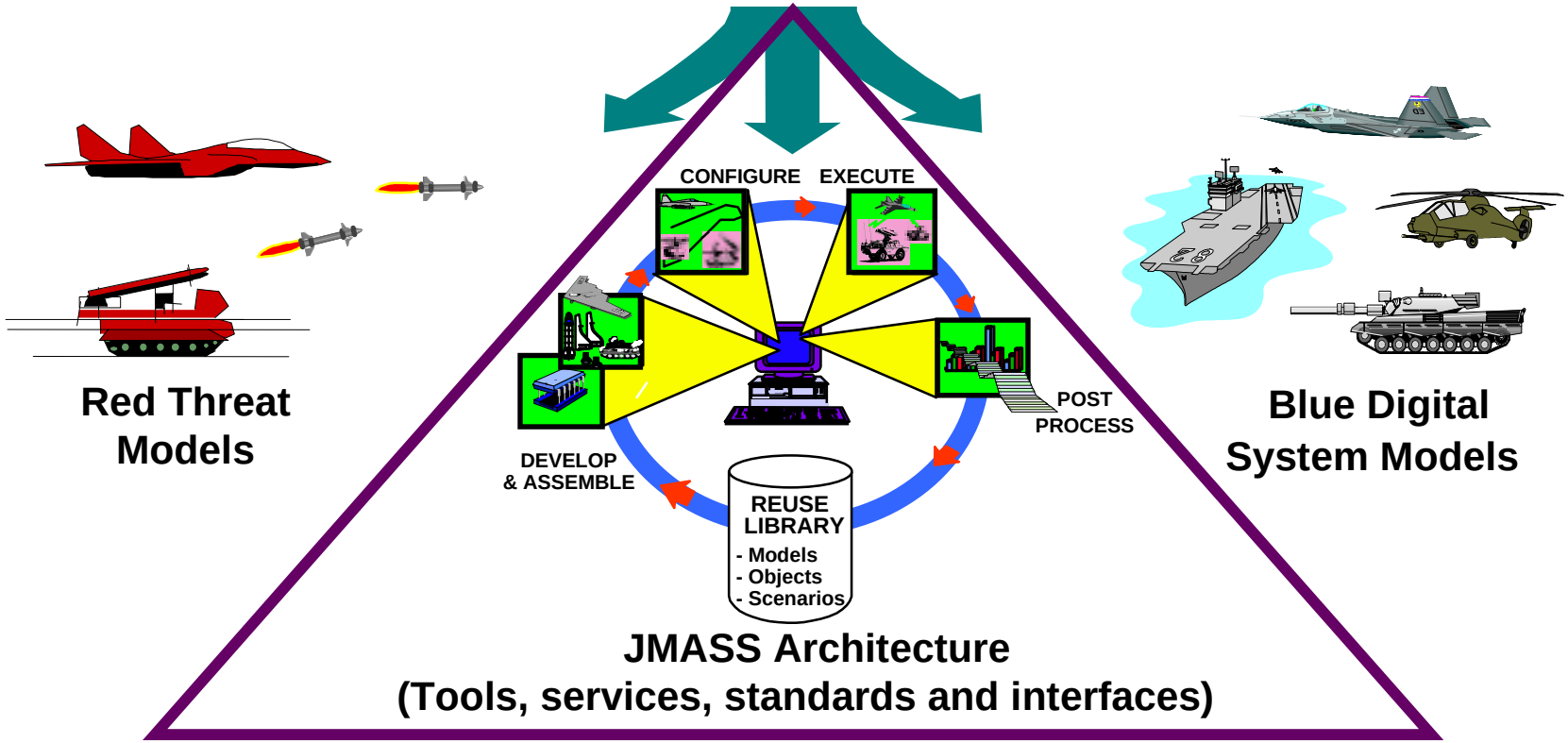
Engagement & Engineering: System & subsystem performance based on the interactions between a few highly detailed objects

JMASS is being built for the Engagement and Engineering-level

Four Parts of JMASS

Legacy Model Function Implementation

- **Fuzing**
- **Endgame (P_k) calculations**
- **Pilot Mental Model**
- **Missile Flyout**



Red Threat Models

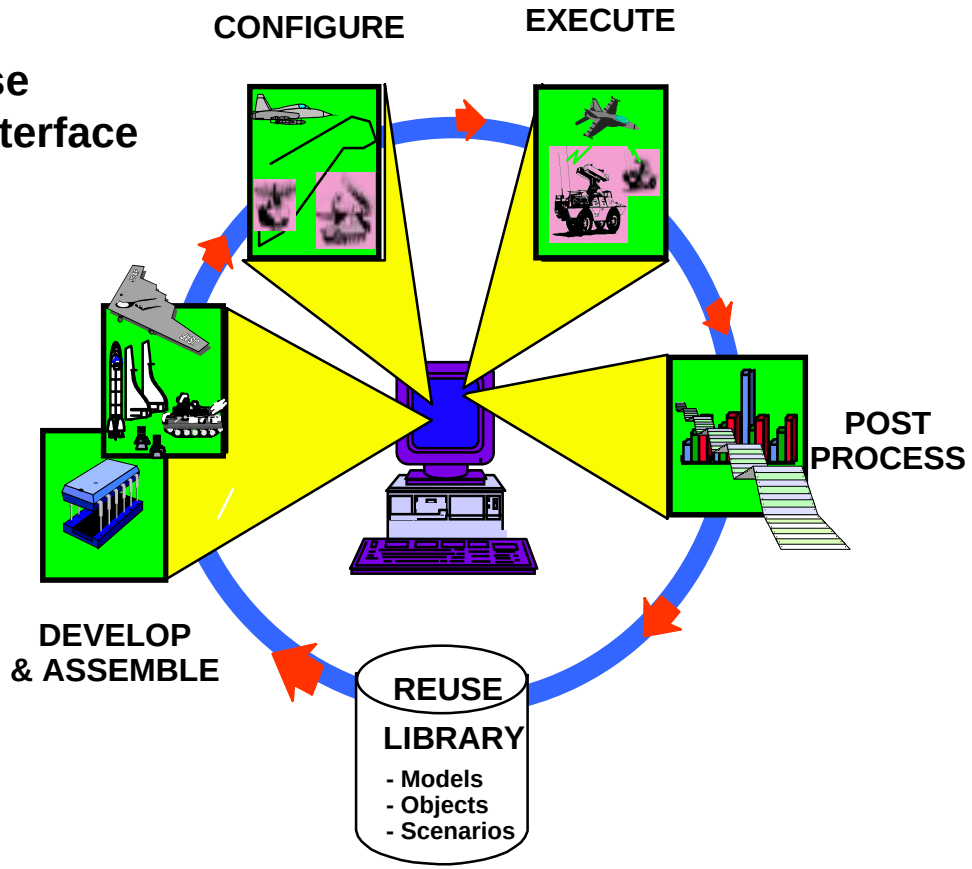
Blue Digital System Models

JMASS Architecture
(Tools, services, standards and interfaces)

Tri-Service Program

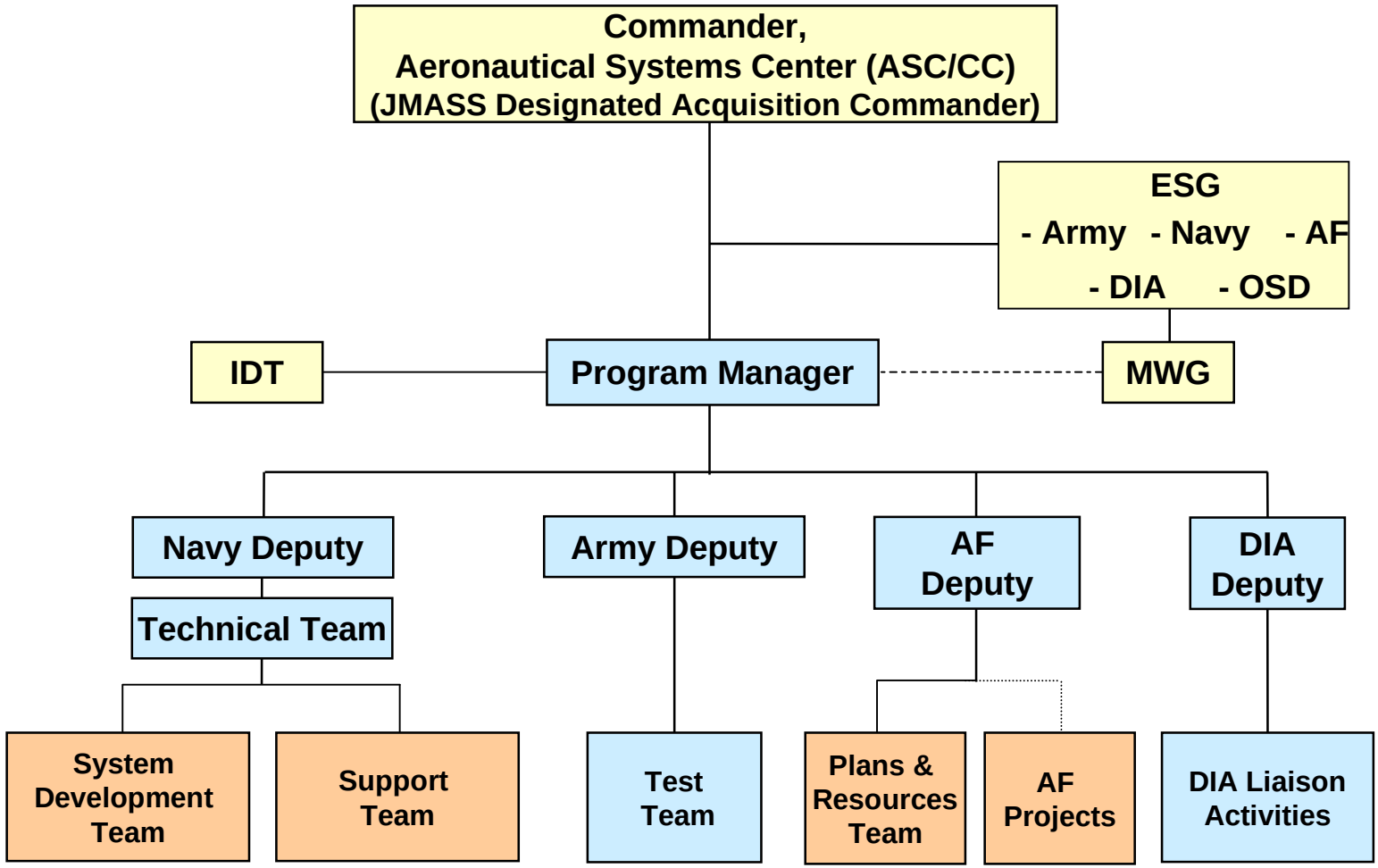
Architecture Description

- **Model Standards**
  - Software Structural Model for Reuse
  - Model Application Programming Interface
- **Simulation Support Environment**
  - Simulation Engine
  - Visual Development Tools
  - Analysis Tools
  - COTS & Legacy Tool Interface
- **Model Library & Repository**
  - Local Model and Data Library
  - Modeling and Simulation Resource Repository

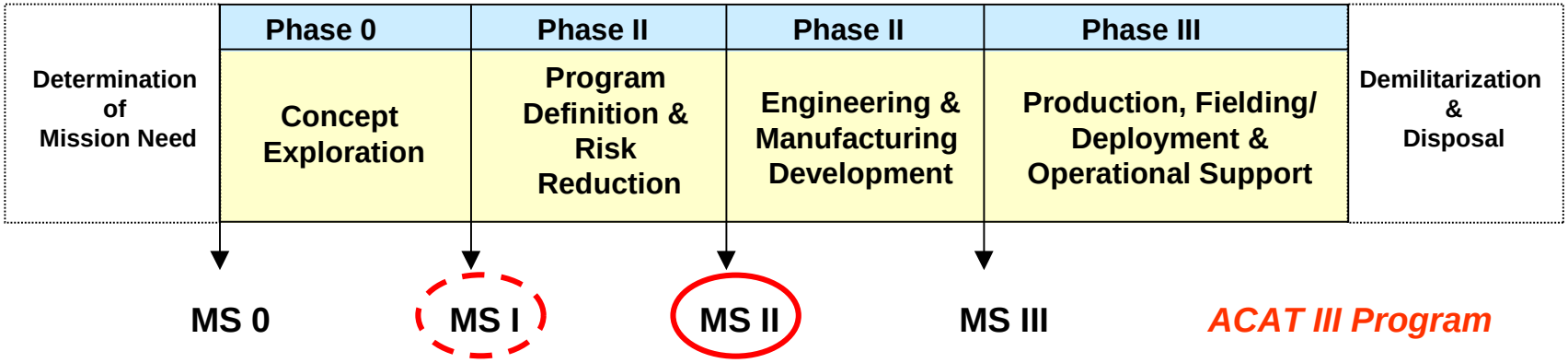


Yield is common, reusable, interoperable models

Joint Program Office Organization



JMASS "Quicklook"



Foundation Documents

MNS	*31 Aug 98*
JORD	*31 Aug 98*
MOA	*19 Sep 99*
MWG Charter	*6 Oct 99*
ESG Charter	*28 Oct 99*
APB	*4 May 00*
PMD	*15 Jun 00*

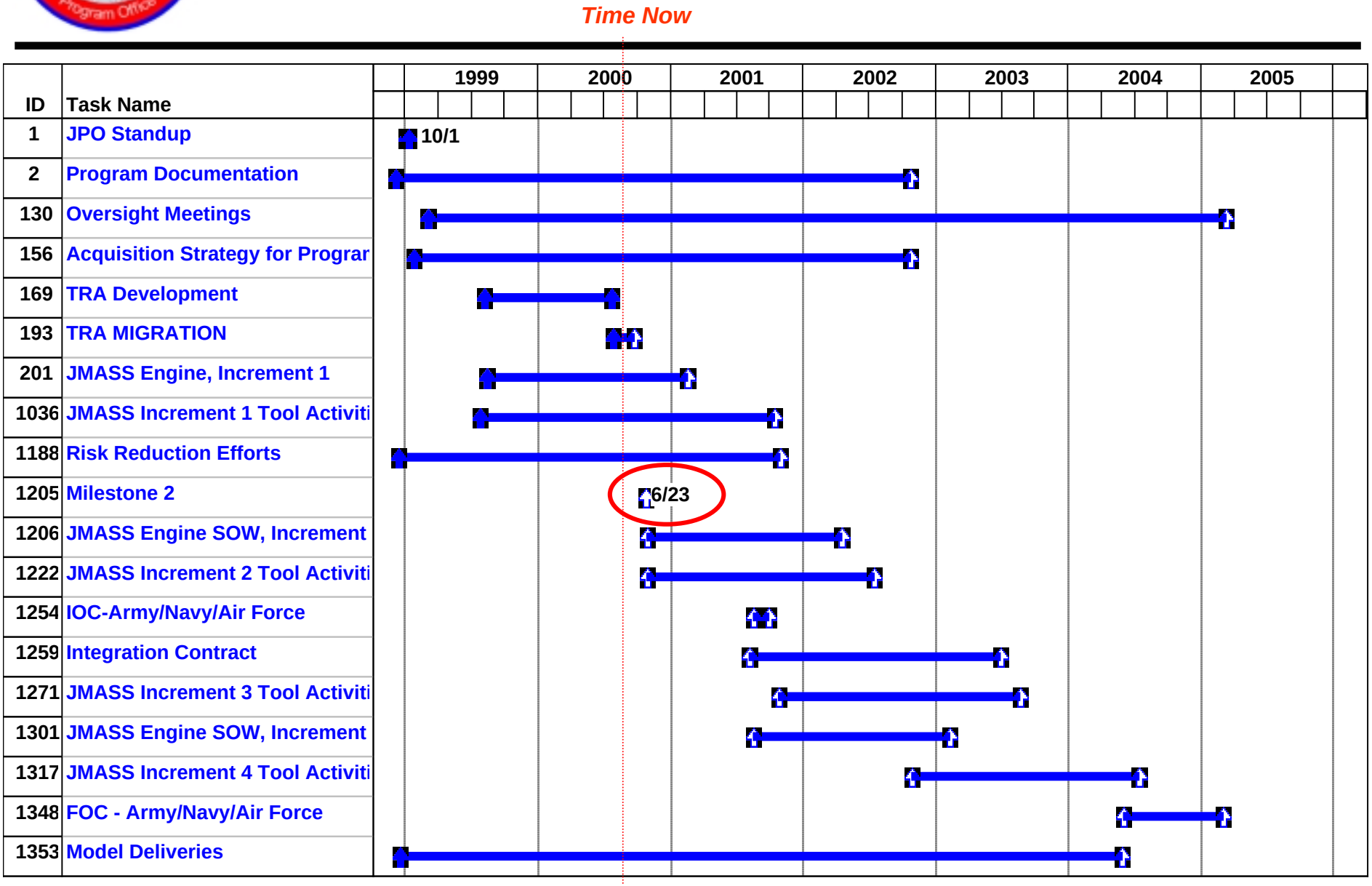
Risk Reduction Activities

- *PC Prototype*
- *JMASS98*
- *EO/IR Env Prototype*
- *AMC Tool*
- *Analyst Toolkit*
- *Scenario Laydown*
- *Viewer Integration*
- *Real-time Prototype*
- *HLA experiment*
- *SPEEDES*

Acquisition Strategy

- "As Is" & "To Be" TRA
- Open System
- COTS/GOTS/NDI
- Spiral Development
- User Feedback

JMASS Integrated Master Schedule



ID	Task Name
1	JPO Standup
2	Program Documentation
130	Oversight Meetings
156	Acquisition Strategy for Prograr
169	TRA Development
193	TRA MIGRATION
201	JMASS Engine, Increment 1
1036	JMASS Increment 1 Tool Activiti
1188	Risk Reduction Efforts
1205	Milestone 2
1206	JMASS Engine SOW, Increment
1222	JMASS Increment 2 Tool Activiti
1254	IOC-Army/Navy/Air Force
1259	Integration Contract
1271	JMASS Increment 3 Tool Activiti
1301	JMASS Engine SOW, Increment
1317	JMASS Increment 4 Tool Activiti
1348	FOC - Army/Navy/Air Force
1353	Model Deliveries

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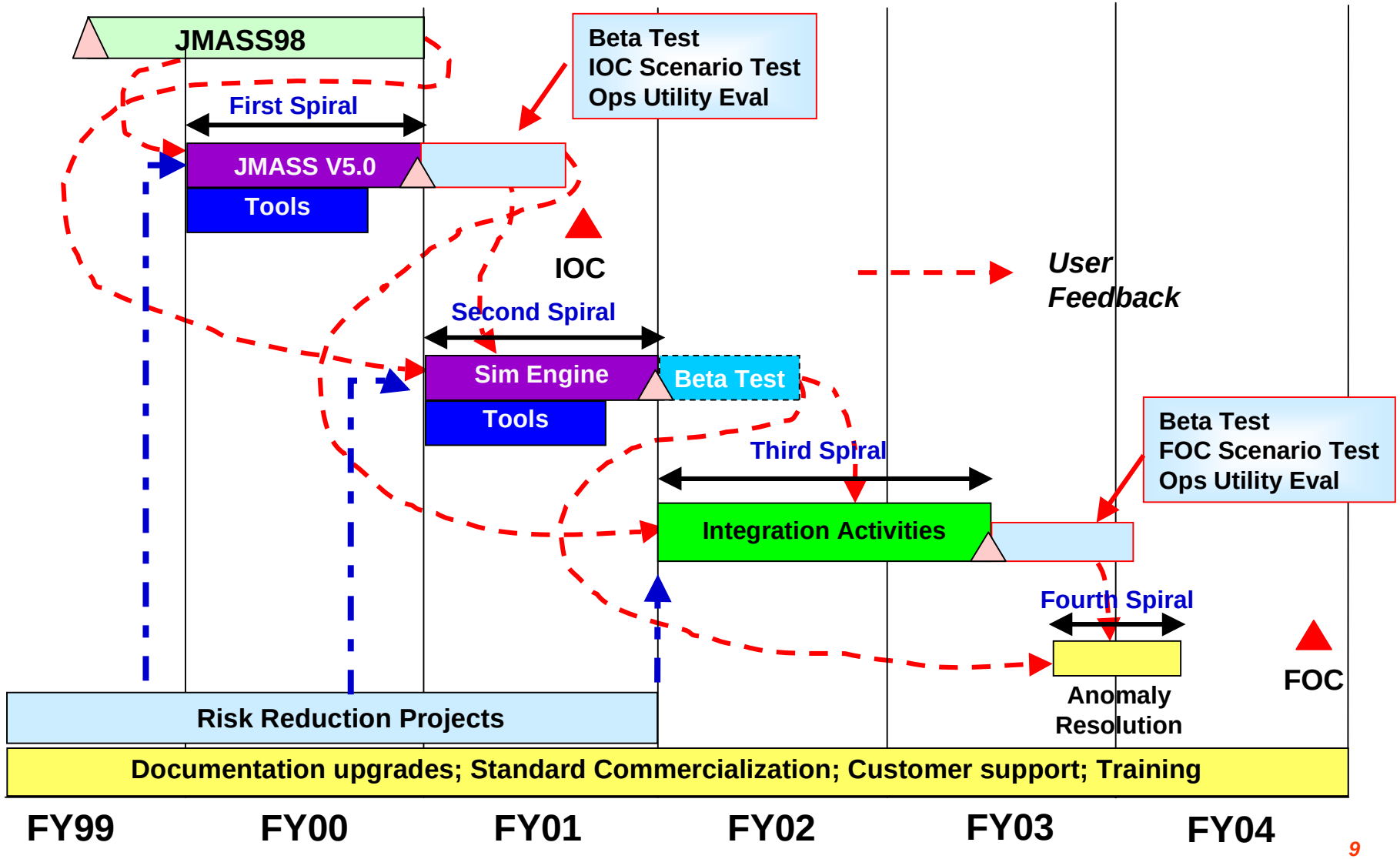
Spiral Development Approach



Spiral #1 Contracts

- AEgis Technologies Group, Inc.
  - Auto-Generating HLA SOMs and JMASS Ports from FOMs using OMDT Pro
  - Interface of Advanced Continuous Simulation Language (ACSL) with JMASS
- TRW Inc., Systems & Information Technology Group & CACI, Inc.
  - JMASS Analyst Capability Kit (JACK)
- MäK Technologies
  - A COTS Solution for 3D Visualization, Data Collection, and Data Playback
- SPARTA, Inc.
  - AMCTool Upgrade
- CACI, Inc. & TRW Inc., Systems & Information Technology Group
  - JMOOSE Stabilization
- DYNETICS, Inc.
  - JMASS 5.0 Simulation Engine
- LOGICON, Inc. & RAM Technologies, Inc. (via SPAWAR PMW 131)
  - SPEEDES Simulation Engine Risk Reduction Project
- ILLINOIS INSTITUTE OF TECHNOLOGY RESEARCH INSTITUTE (IITRI)
  - Technical Reference Architecture

JMASS V5.0

- Convert services to operate as selectable, plug-In modules
- Incorporate High Level Architecture
- Extend Terrain to support Digital Terrain Elevation Data (DTED)
- Extend Atmosphere to support the EO/IR environment
- State-of-the-art Help System
- Player level multithreading
- Productize risk reduction products
- GUI improvements
- Develop/enhance technical reference documentation Customer Support, Training, Testing, and Outreach

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Preliminary FY01 Planning

- Simulation engine upgrades
- Tool integration contracts
- Support and training
- Template Models
- IOC scenario development
- Environments
- Outreach
- JMASS Integration Facility
- Test
- Risk reduction projects
- GUI requirements and prototyping
- Configuration Management
  - Procedure development, implementation
- SPEEDES follow-on
- Interface documentation & commercialization
- JMASS simulation integration process

Simulation Engine Upgrades

- Distributed processing (multiple platforms, multiple threads)
- Time management service (scaled real-time, time-tagging, local, non-local clocks)
- Stop, save, abort, re-load and resume execution
- Dynamic inclusion/removal of models
- Customizable installation process
- Configuration GUI improvement implementation
- Directory structure improvements
- Update and expand system test processes and procedures
  - Backward compatibility for models

Tool Integration Contracts

- 2-D line contour maps
- 3-D topology contour map visualization
- Model design tool (e.g., UML)
- FAST tool fixes/enhancements
- Augment JACK
  - End-game
  - Oilstock
  - FAST
  - JVIEW

Potential Spiral 2
Risk Reduction Projects

- Methodologies for non-wrapping conversion of legacy models
- WIN NT real-time
- Scenario laydown requirements definition
- Web-based training and support
- Navy undersea scenario
- Investigate incorporating DoD data formats
- Model repository development

Simulation Integration Process

- **Develop, document, baseline, distribute, support and maintain model documentation standards**
  - **System description**
  - **Algorithm description**
  - **Interfaces**
  - **Verification and validation reports**

- **Develop, document, baseline, distribute, support and maintain simulation integration processes and procedures**

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Summary

- **JMASS gaining wider acceptance across the modeling and simulation community**
- **First Joint program delivery will be JMASS 5.0**

To contact JMASS Program Office

www.jmass.wpafb.af.mil