Joint Effects Model (JEM) Briefing to CBIS

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JEM Program Office Org Chart

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Dan Hallock
Block 1 DAPM
LT Curt Wall
Block 2 DAPM

IMT Lead: Kevin Adams
ILog Lead: Liz Holland
Sustainment Lead: Ed Bray
Deployment Lead: Jim Bryan

Program Support:
Susan Sullivan
Add'l staff TBD

PMO Engineering Support:
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Kristin Baird

Software
Development
Lead: Steve Twyman
Northrop-Grumman

Financial Mgmt:
Robert Dubbs
Mitch McKinney

System Engineering IPT
Lead: Ralph Nebiker

WF IPT
Lead: TBD

T&E IPT Lead: Russell Brown
Accreditation Agent: Mike Metz

Description

- **JEM is an ACAT III Program that will provide a single, validated capability to predict the transport and dispersion of Chemical, Biological, Radiological and Nuclear/Toxic Industrial Hazard events and their effects**

- **JEM will be <u>accredited</u> for all uses currently supported by the three interim accredited DoD S&T Hazard Prediction Models**

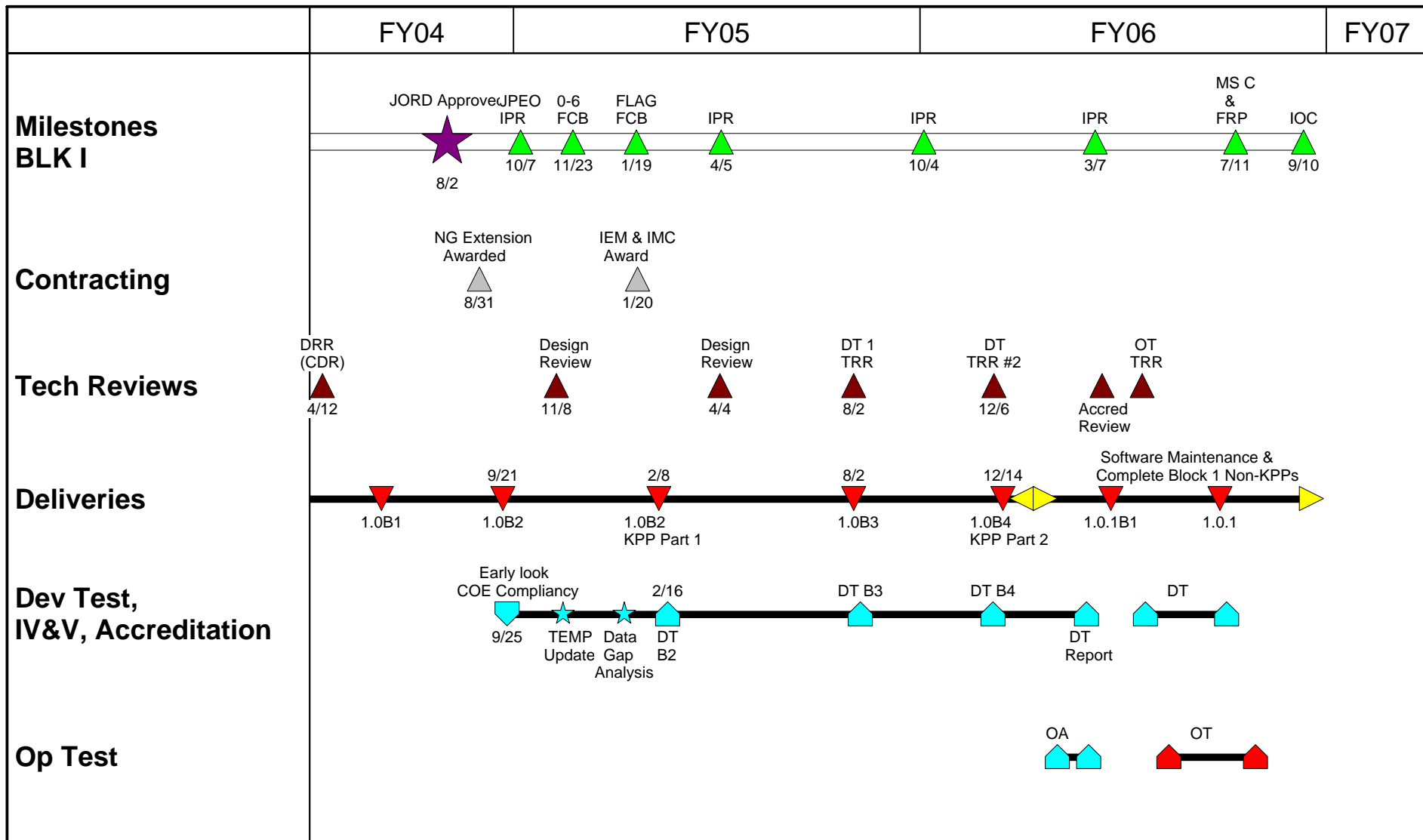- **JEM will be integrated with service Command & Control Systems and will also be available as Standalone**

Core Capabilities

- **Transitions HPAC, VLSTRACK, and D2PUFF technologies and <u>baselines</u> the DoD hazard prediction capability**
- **Supports multiple deployment strategies**
  - **Operates on both UNIX and Windows operating systems**
  - **Common Operational Environment (COE) / Network Centric Enterprise Services (NCES) / GIG / Service C2 systems**
  - **Standalone, Networked, Distributed, or Web access**
- **Provides high fidelity hazard predictions to:**
  - **Joint Warning and Reporting Network (JWARN)**
  - **Joint Operational Effects Federation (JOEF)**
  - **<u>Any authorized system</u> calling the JEM Web Services Interface**
- **Interoperates with meteorological data systems**
  - **Virtual Natural Environment Net Centric Services (VNE-NCS), METOC Data Service (MDS), Integrated Meteorological System (IMETS), Joint Weather Impact System (JWIS), and others**
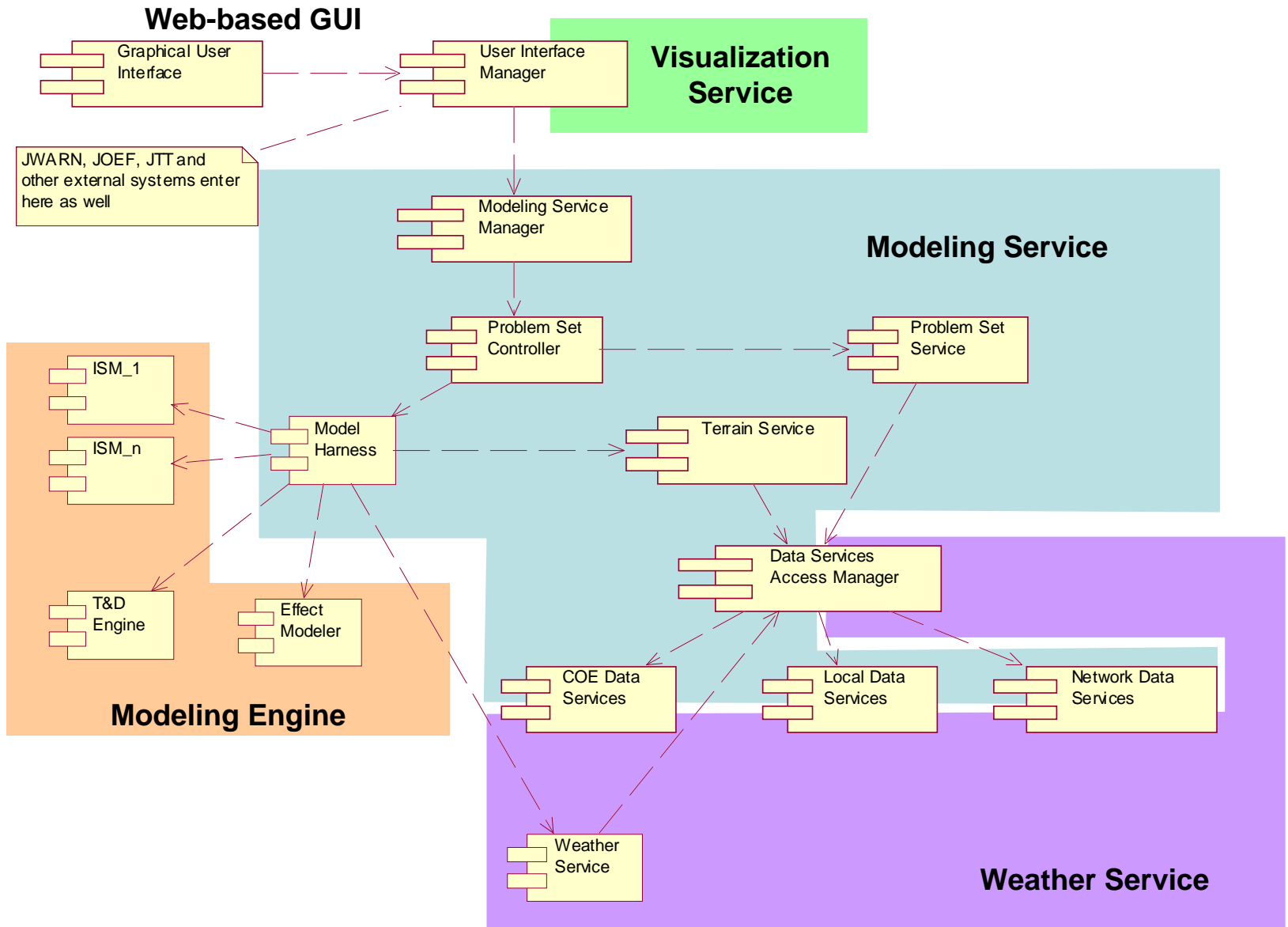
JEM Block 1 Schedule

	FY04	FY05	FY06	FY07

Milestones BLK I

JORD Approve   JPEO IPR   0-6 FCB   FLAG FCB   IPR   IPR   IPR   MS C & FRP   IOC

8/2   10/7   11/23   1/19   4/5   10/4   3/7   7/11   9/10

Contracting

NG Extension Awarded — 8/31

IEM & IMC Award — 1/20

Tech Reviews

DRR (CDR) — 4/12

Design Review — 11/8

Design Review — 4/4

DT 1 TRR — 8/2

DT TRR #2 — 12/6

OT TRR / Accred Review

Deliveries

1.0B1   9/21 1.0B2   2/8 1.0B2 KPP Part 1   8/2 1.0B3   12/14 1.0B4 KPP Part 2   1.0.1B1   1.0.1

Software Maintenance & Complete Block 1 Non-KPPs

Dev Test, IV&V, Accreditation

Early look COE Compliancy — 9/25

TEMP Update

Data Gap Analysis

2/16 DT B2

DT B3

DT B4 / DT Report

DT

Op Test

OA

OT

Component Level Diagram

Modeling Capability Overview

- **Modeling Interfaces**
  - **Defined by the Modeling WSDL**
  - **WSDL will use the CBRN Data Model terminology**
  - **W3C standard's SOAP communication over HTTP**
  - **Allows external applications to**
    - **Receive a list of Problem Set Templates**
    - **Run a Problem Set Template against their inputs**
    - **Define and run a single incident using defined terrain type and fixed wind data or download weather data from a specified weather server**
    - **Suspend, resume, terminate a run**
    - **Retrieve a file listing the inputs and the resulting plot data**
    - **Default run parameters values are used**
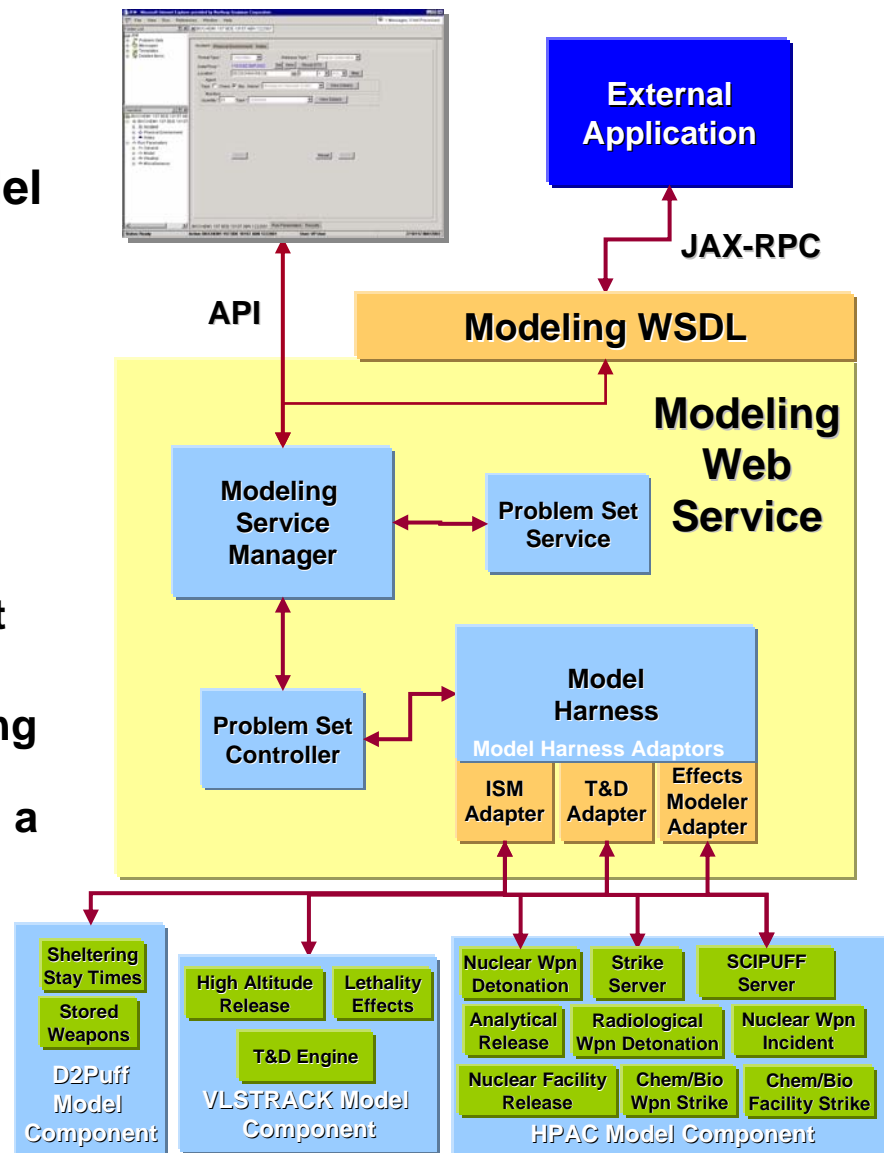
Weather Service Overview

- **Provides METOC data for JEM, JWARN and JOEF**

- **W3C standard SOAP communication over HTTPS**

- **Aligns with CBRN Data Model**

- **Connects to Weather Servers through Connectors**
  - MDS
  - Virtual Natural Environment Net Centric Services (VNE-NCS)
  - JWIS
  - IMETS

- **Expandable – can readily add new Weather Connectors**

- **Supports caching weather files in the file system**

External Applications

JEM Modelling Web Service

HTTP   Weather Request

Weather WSDL

Weather Web Service

Translate Request   Translate Data

Weather Connectors

Weather Requests

METOC Weather Server (MDS)   VNE-NCS   JWIS   IMETS

JEM Results Tab

Notional 3 Block Schedule

	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11

Block 1 Milestones

DT IOC

MSB MSC Sustainment

Notional Block 2 Milestones

Tech Transition IOC

MSB MSC

Notional Block 3 Milestones

Tech Transition IOC

MSB MS C
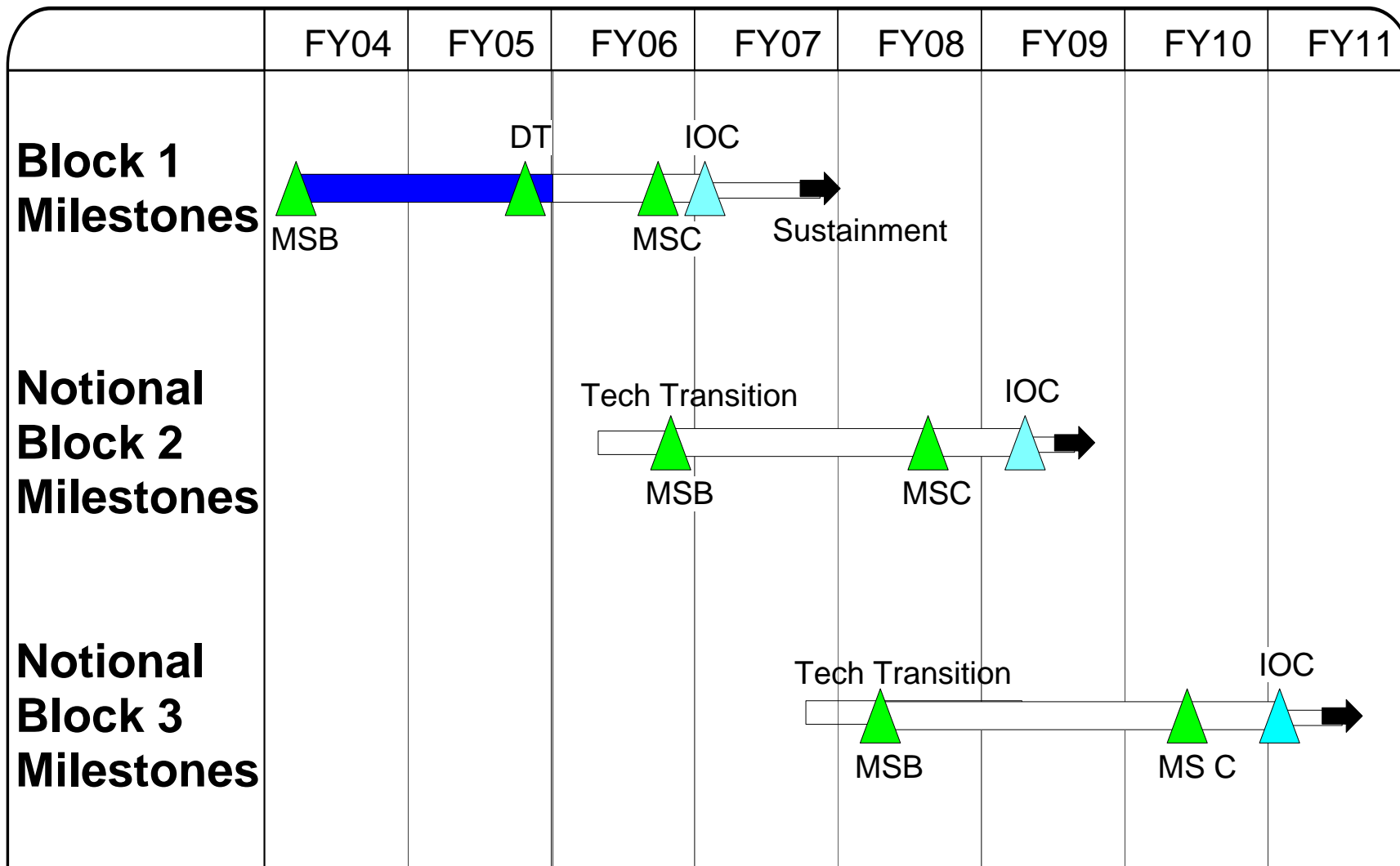
JEM Block II

- **Technologies for Block II:**
  - **Urban Modeling**
  - **Littoral/Coastal Effects Modeling**
  - **Missile Intercept Hazard Prediction**
  - **10% Improvement in Speed & Accuracy of JEM Baseline**
  - **Source Term Estimation (Backtracking)**
    - **Includes incorporating sensor data**
      - **Estimate source term**
      - **Refine hazard prediction**
  - **Calculate initial & delayed casualties and incapacitation for both civilian and military populations**
  - **Estimate effects from a 5,000 weapon strike in less than 90 minutes**
  - **Allow user to modify input parameters to accommodate population migrations**
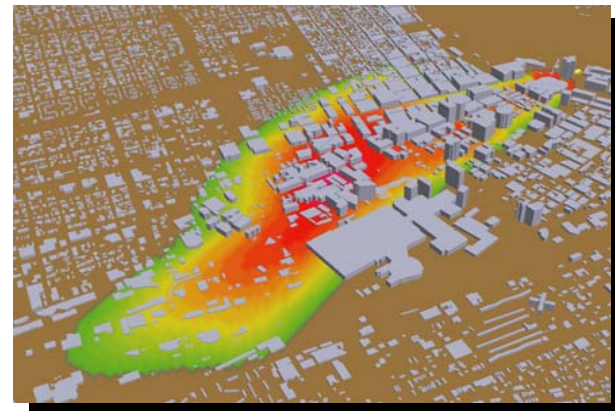
JEM Block II Strategy

- **Request For Information (RFI) Issued 2004**
  - **Final report (Aug 2004) assessed technology based on:**
    - **Documentation**
    - **Interviews with developers, not users**
  - **Priority given to VV&A History**
  - **Technology readiness levels / Assessments dated**
  - **Areas addressed/solicited:**
    - Urban Hazard Effects Prediction Modeling Capability
    - Improved Transport and Diffusion (T&D) Methodology
    - Intercepted Missile Hazard Effects Prediction Capability
    - Coastal and Littoral Areas Capability
    - Improved Population Impact Capability
    - Source Term Location Estimation Capability
    - Strike File Capability

Block II Strategy – Way Forward

- **Request For Information (RFI)**
  - **Reconvene Independent Model Analysis Team**
  - **Refresh report on technology/reassess TRLs**
  - **Support Analysis of Alternatives (AoA) – JCIDS**
  - **Determine if technology fits in Block II or III**
  - **Support generation of CDD (ORD)**
  - **Lever results and analysis in BAA selection process**

- **Planning on 2 contracts**
  - **Request For Proposal (RFP) for Integrator**
    - **Integrate all technologies/models into one baseline**
  - **Broad Area Announcement (BAA) for models/technologies**
    - **Multiple contracts issued to specific capabilities**

Block 3 Requirements

- **Block 3:**
  - **Waterborne Hazards**
  - **Complex structures, Building interiors**
  - **Human performance degradation**
  - **Contagious/infectious diseases**
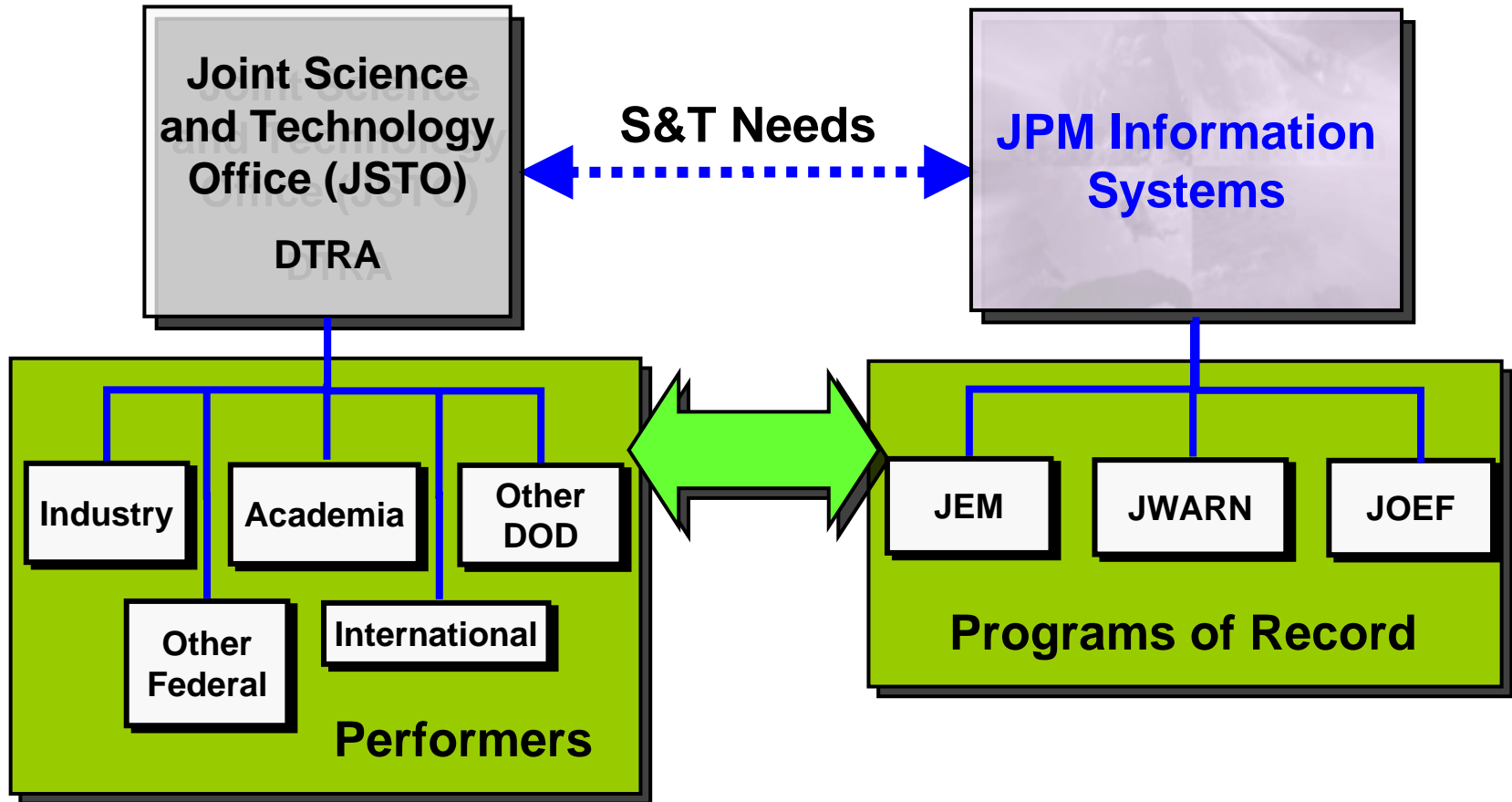 - **Effects on aircraft at various altitudes/ships underway**

JEM Technology Challenges

- **Performance of Service Oriented Architecture (SOA) applications on CPU & memory constrained systems**

- **Incorporating urban hazard modeling and other advanced modeling into SOA**

- **Satisfying diverse weather requirements**
  - **Data intensive**
  - **In-and-out of COMMS issues**
  - **Service specific data needs**

- **Maturity of advanced modeling capability**
  - **Nature of S&T development programs**
  - **Reliable data for supporting model technologies**

Science & Technology (S&T) Transition

Joint Science and Technology Office (JSTO)

DTRA

JPM Information Systems

S&T Needs

Industry

Academia

Other DOD

Other Federal

International

Performers

JEM

JWARN

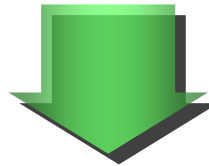**JOEF**

Programs of Record

JPM IS coordinates with the JSTO for S&T needs
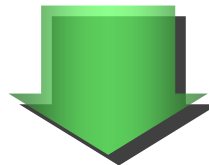
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S&T Transition Example

- **Agent Fate S&T Program**
  - **Addressing Secondary Evaporation of CB Agents**
  - **Produces more accurate data**

- **JSTO & JPM IS agree on data custodianship**
- **Transition data to JPM IS via technology transfer agreement (TTA)**

- **JEM will incorporate new Secondary Evaporation data**
  - **Improves model accuracy**

JEM Status

- **Working closely with JSTO on Block 2 & 3 technologies**

- **Participating in International Task Force 49 (ITF-49) to increase interoperability between Canada, UK, and US**

- **On track for successful Block 1 Milestone C in Fall 2006**

- **Making preparations for Block 2 Milestone B in FY2006**

Questions?