



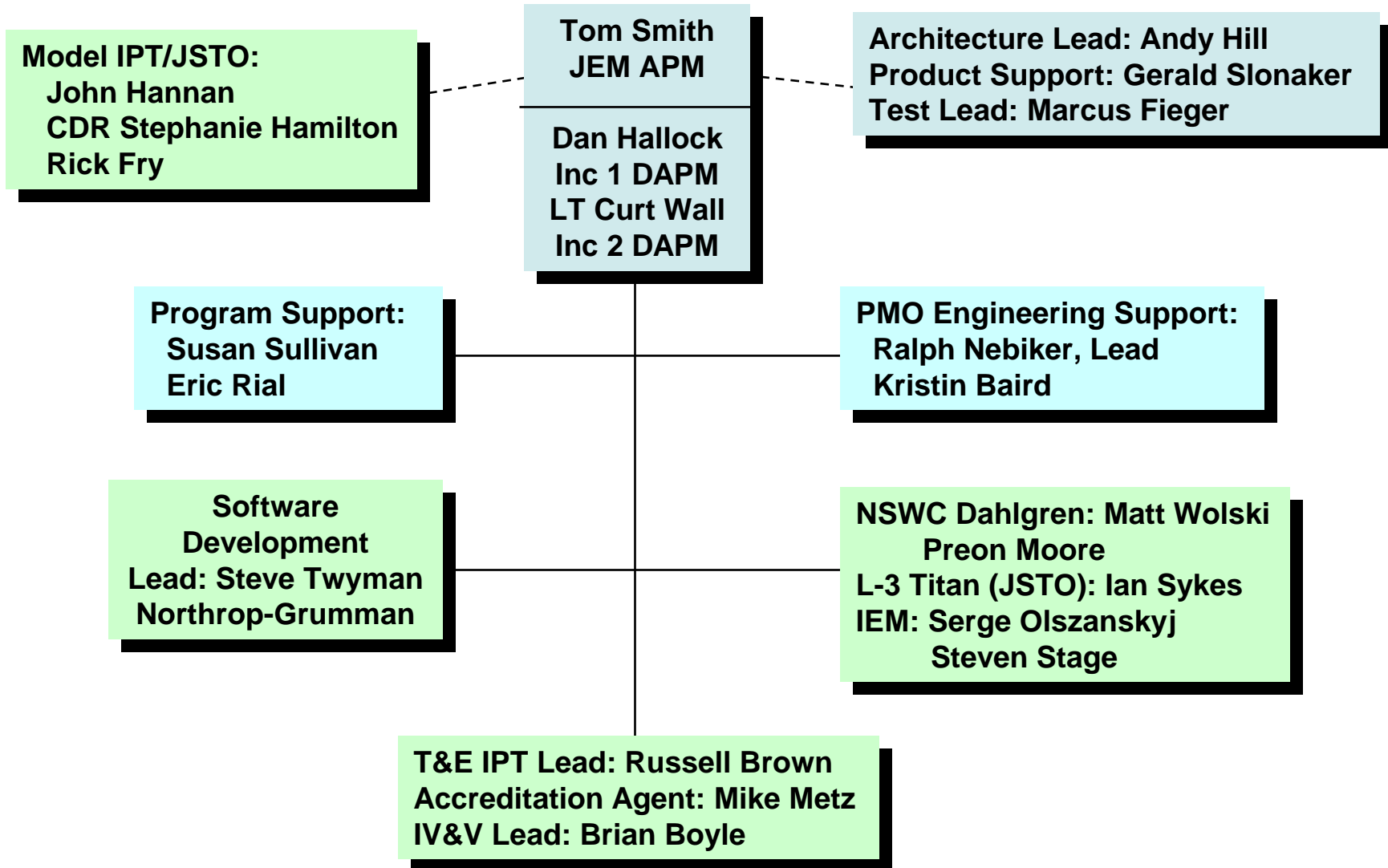
Joint Effects Model (JEM) Briefing to CBIS

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JEM Program Office Org Chart





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 accredited for all uses currently supported by the three interim accredited DoD S&T Hazard Prediction Models**
- **JEM will be integrated with Joint and Service Command & Control Systems and will also be available as Standalone**

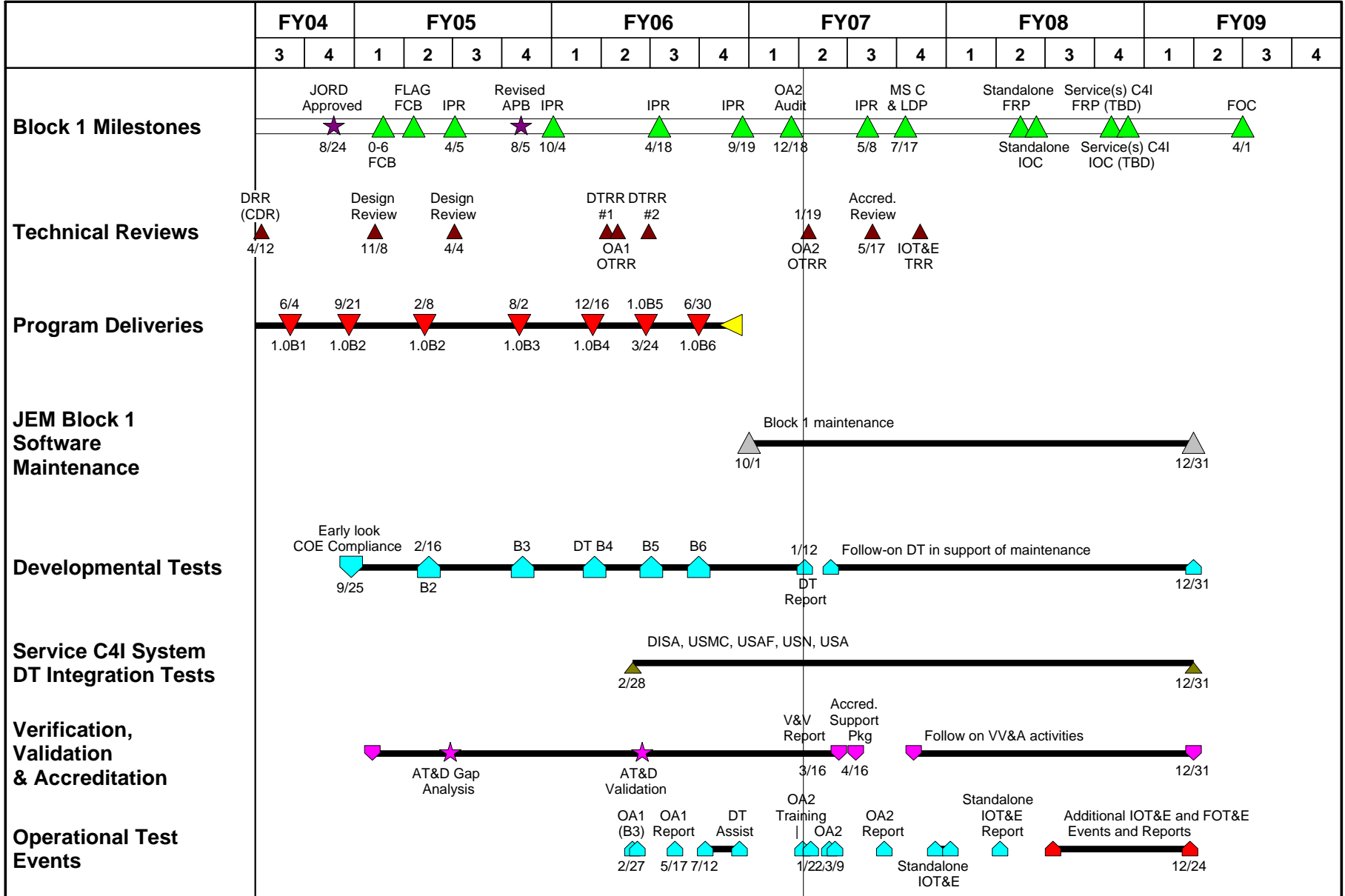


Core Capabilities

- **Transitions HPAC, VLSTRACK, and D2PUFF technologies, and baselines 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)
 - Any system 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

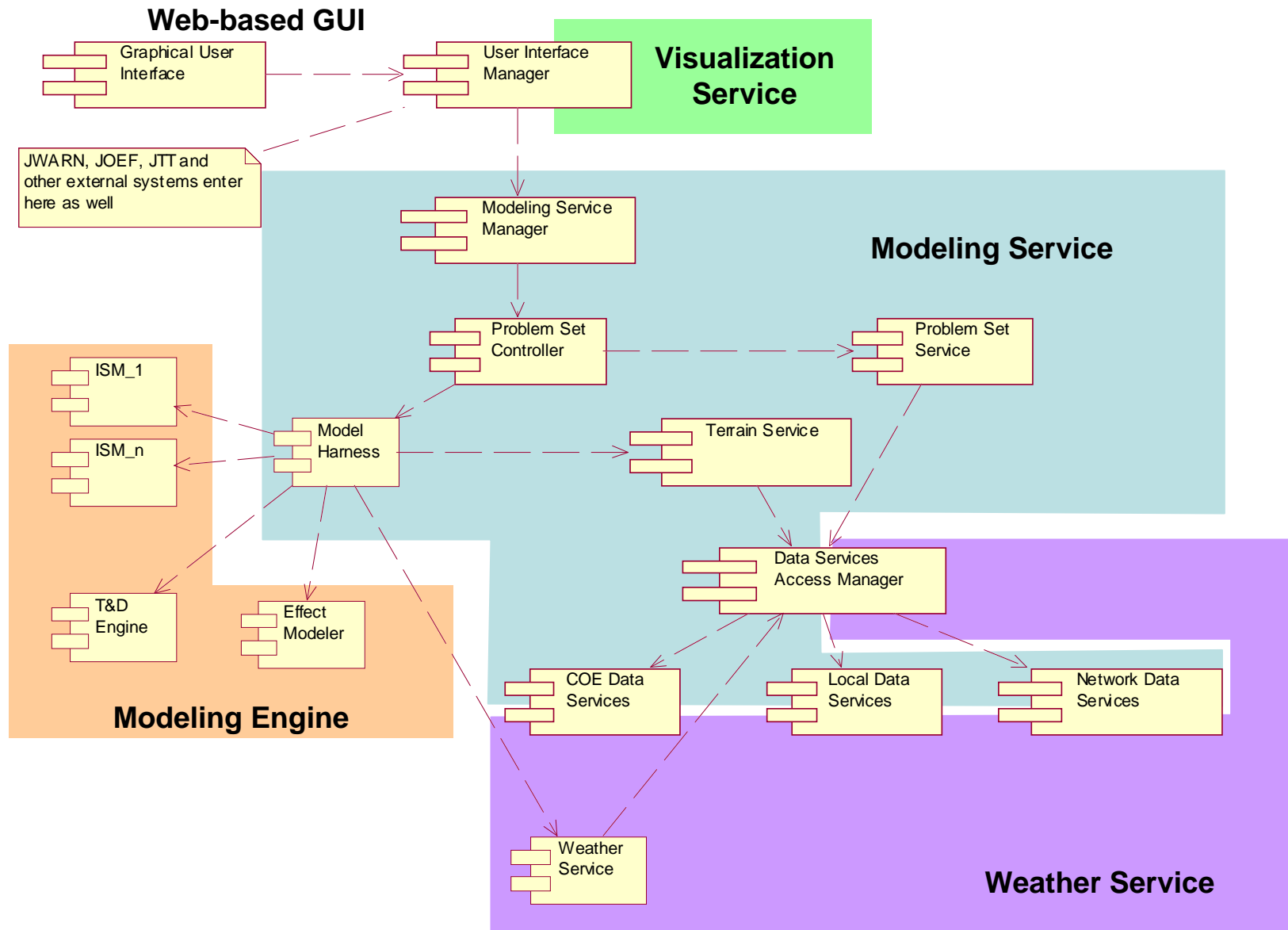


JEM Increment 1 Schedule



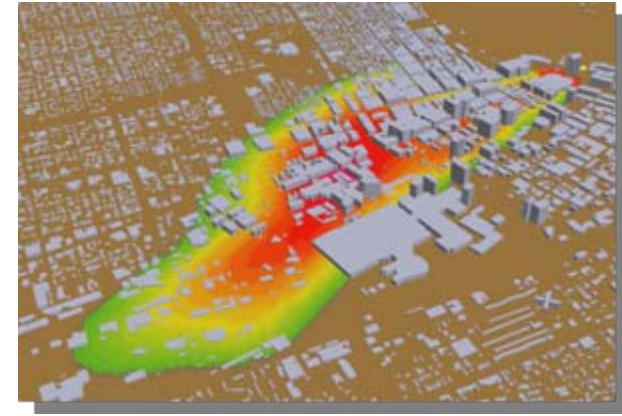


Service Oriented Architecture (SOA)





JEM Increment 2



- **Technologies for Increment 2:**
 - Urban Modeling
 - Littoral/Coastal Effects Modeling
 - Missile Intercept Hazard Prediction
 - 10% Improvement in Speed & Accuracy of JEM Baseline
 - Source Term Estimation (Backtracking)
 - Uses data gathered from sensors
 - Estimate source term
 - Refine hazard prediction
 - Includes processing of sensor data received from JWARN
 - 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 Increment 2 Way-Forward

- **Complete fielding of Increment 1**
- **Work with JRO/SHAPE ICT on Capability Development Document (CDD) in preparation for Milestone C**
- **Conduct Analysis of Alternatives (AoA) – JCIDS**
 - Work through JSTO for identification and assistance in identifying and selecting appropriate technologies
 - Model Integrated Product Team (IPT)
 - Technology Transfer Agreements (TTA)
- **Identify Government Agencies with additional capability**
 - Lawrence Livermore National Laboratory (LLNL)
 - Missile Defense Agency (MDA)
 - Service research laboratories
- **Issue Broad Agency Announcement (BAA) to fill gaps not covered by JSTO sponsored technologies**
- **Design, develop, test software FY08-FY10**



Increment 3 Requirements

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



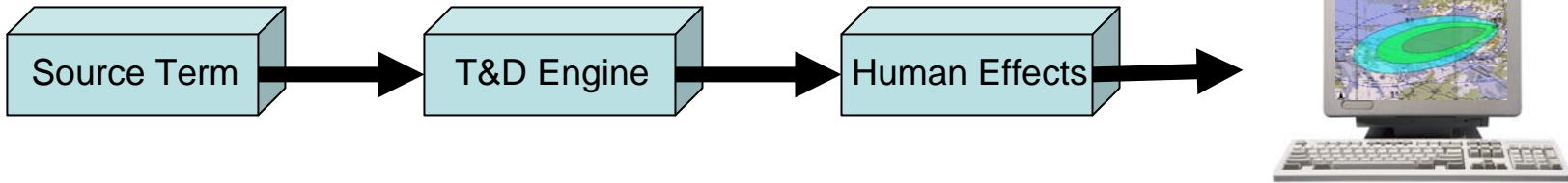
JEM Technology Challenges

- **Performance of Service Oriented Architecture (SOA) applications on CPU & memory constrained systems**
- **Incorporating urban hazard modeling and other advanced modeling into SOA**
 - JSTO/DSTL successfully implemented UDM into JEM
- **Maturity of advanced modeling capability**
 - Nature of S&T development programs
 - Reliable data for supporting model technologies
 - Demand for the next best thing...but what about Verification Validation and Accreditation (VV&A)?
- **Diverse Joint and Service specific weather models**
- **Evolving Joint and Service C4I system baselines**
- **Combining multiple CBRN hazard models, maintaining the integrity of the core technologies, and proving it**

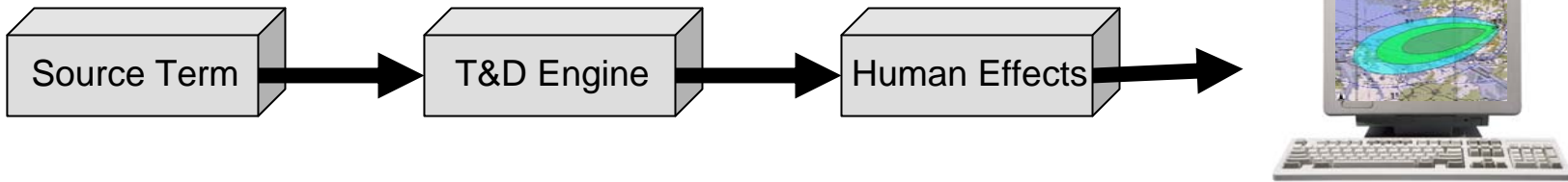


Pre-JEM Model Sequencing

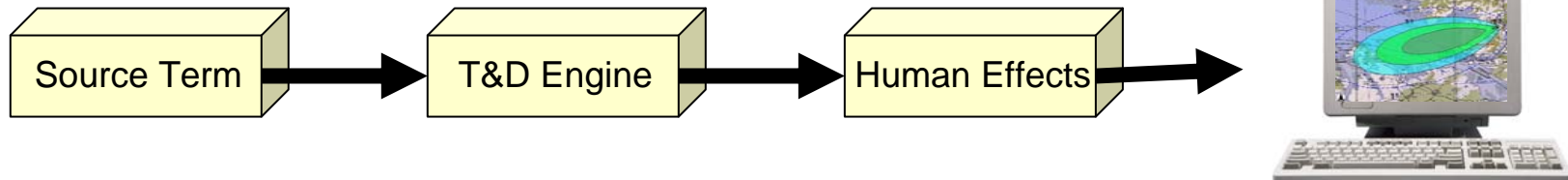
VLSTRACK



HPAC

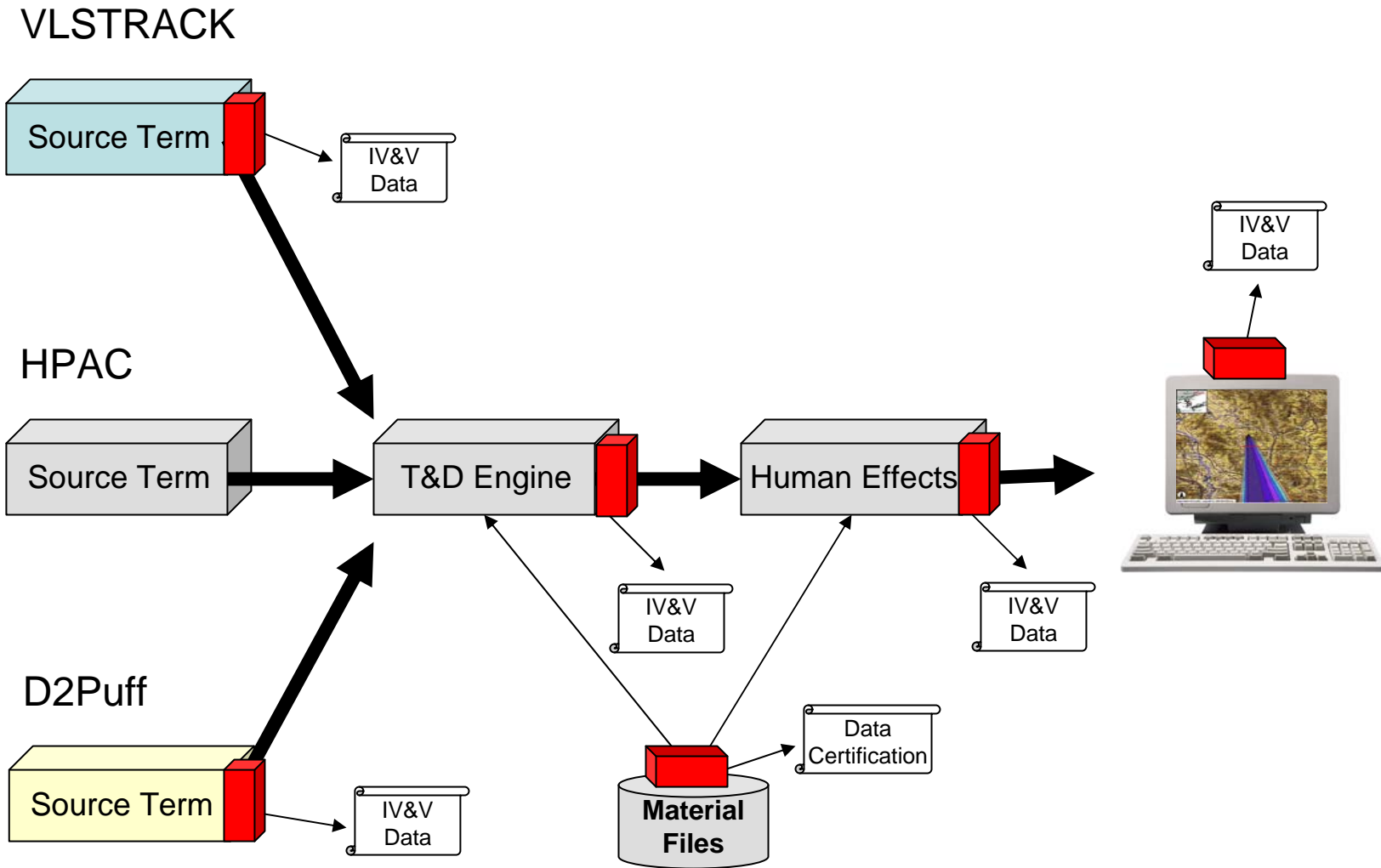


D2Puff



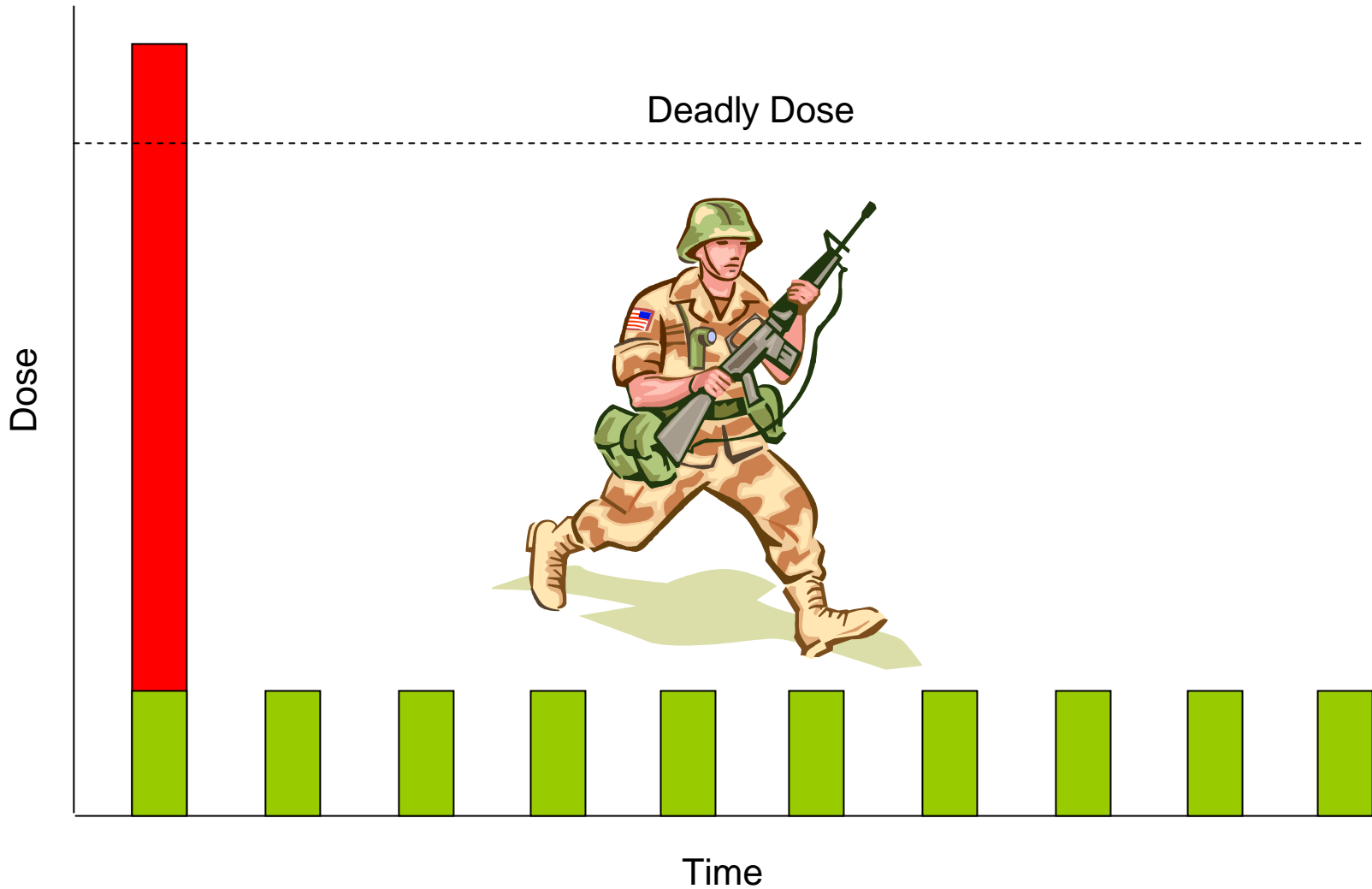


JEM IV&V Data Points





JEM Toxicity Factors – How do we model it?





JEM Accreditation Challenges

Reported Agent Characteristics



Reported and Forecast Weather



Protection Levels



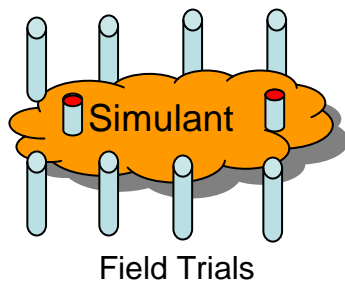
Accuracy?
Risk?
Intended Use?

JEM CBRN Hazard Modeling Software

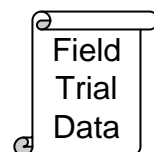
Source Term

T&D Engine

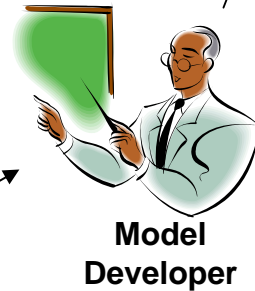
Human Effects



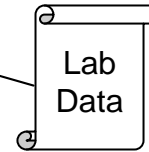
Field Trials



Field Trial Data



Model Developer



Lab Data





JEM Status

- **Coordinating with JSTO on Increment 2 & 3 technologies**
- **Participating in International Task Force 49 (ITF-49) and Tech Panel 9 (TP-9) to increase interoperability between Canada, UK, US and other international partners**
- **Finalizing Increment 1 Verification, Validation and Accreditation (VV&A) activities for 3QFY07 review**
- **Preparing for Increment 1 Milestone C in 3QFY07**
- **Preparing for Standalone Operational Test in 4QFY07**
- **Continuing to work with Joint & Service C4I systems**
- **Preparing for Increment 2 Milestone B in 1QFY08**



Business Opportunities

| | <u>Time Period</u> |
|--|--|
| <ul style="list-style-type: none">• Physical Science and Technology Broad Agency Announcement (BAA)<ul style="list-style-type: none">– December each year– Other BAA solicitation occurs under the CBDIF program | FY06 & FY07 |
| <ul style="list-style-type: none">• SPAWAR Knowledge Superiority (BAA)<ul style="list-style-type: none">– JPM IS Technology Challenges/S&T Gaps | Open Indefinitely |
| <ul style="list-style-type: none">• JWARN<ul style="list-style-type: none">– JCID production (RFP)– Block 2 Increment 1 Sustainment– Block 2 Increment 2 Design & Development | FY08 – FY12 FY08 and beyond FY08 – FY09 |
| <ul style="list-style-type: none">• JEM<ul style="list-style-type: none">– JEM Lead Integrator (SEAPORT E)<ul style="list-style-type: none">• Sustain Block I• Integrate S&T Capabilities for Block II & Beyond | FY07-FY12 |
| <ul style="list-style-type: none">• JOEF<ul style="list-style-type: none">– JSTO Technology Insertion Increment 1– JSTO Technology Insertion Increment 2– Software Development Increment 2 and beyond | FY06 – FY08 FY06 and beyond FY08 and beyond |



Questions?