



V&A

A Cyber Walk through the VV&A RPG Year 2000 Edition



Presentation to DMSO Industry Days

22 May 2000



Agenda

- History
- RPG - Look and Feel
- VV&A - Key Concepts
- **BREAK (10 minutes)**
- Core Documents – Responsibilities & Challenges
 - User
 - Developer
 - M&S PM
 - V&V Agent
 - Accreditation Agent
- **BREAK (10 minutes)**
- Special Topics/Reference Documents
- Questions & Discussion



RPG History

DoD I:

- Established common terminology and defined high level roles and responsibilities

DoD RPG:

- Defined underlying philosophy, principles, methodologies recommended for use in DoD VV&A efforts
 - First distributed in 1996
 - Well-received (welcomed)
 - adopted by numerous programs (e.g., JADS, JWARS, JSIMS)
 - accepted by Services -- used as foundation for Service VV&A policies



Reader Feedback

- **GREAT! but . . .**
 - Too long
 - Not enough detail
 - One size fits all
 - Doesn't address needs of entire audience
- **Recommendations:**
 - Provide more technical detail
 - which techniques to use when
 - cost estimation
 - metrics
 - Address a broader audience
 - Make it easier to find what is needed



Objective

To address user feedback and issues associated with use of prior RPG

- **Update and Enhance VV&A Recommended Practices Guide (RPG)**
 - Account for diversity of audience
 - Tailor explanations
 - Provide role-specific guidance
 - Account for diversity of situations
 - Tailor procedures
 - Provide context-specific guidance
 - Focus on practical vs theoretical



Vision

The RPG should be a multi-tiered, multi-dimensional document:

➤ **Non-linear**

- VV&A is not “one size fits all”
- Address differences due to type of M&S involved
- Provide different levels of detail to satisfy readers’ needs

➤ **Reader-based**

- Allow reader to see self in document
- Address differences due to reader’s role in VV&A process
- Provide different levels of detail to satisfy readers’ needs

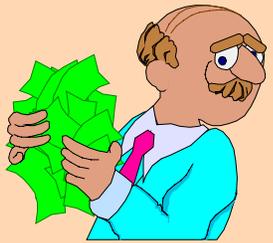
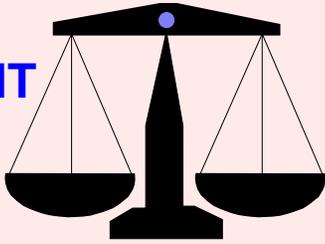
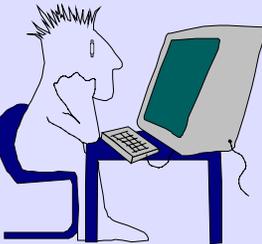


Development Approach

- **Produce a web-based document**
 - Prepare information according to roles/functions
 - User, M&S PM, Developer, V&V Agent, Accreditation Agent
 - Prepare information according to simulation types
 - Legacy stand-alone, New stand-alone, Federation
 - Prepare information in multiple levels of detail
- **Structure using multiple layers and paths**
 - Main level for key concepts, general information
 - Core documents for each Role-Simulation combo
 - Pop-up windows, hypertext links for additional technical information
- **Advantages**
 - Allows greater breadth and depth
 - Facilitates addition of information over time
 - Empowers the reader



Principal Authors

 <p>USER Bob Senko, Industry DMSO Support</p>	<p>M&S PROGRAM MANAGER Terry Prosser, Industry JWARS, C4ISR Dave Hoffman, Gov't</p> 
<p>ACCREDITATION AGENT Paul Muessig, Gov't Director, JASA</p> 	
 <p>V&V AGENT Bob Lewis, Industry NMD, DIS</p>	<p>M&S DEVELOPER Mike Metz, Industry STOW, JWARS, JSIMS, JCOS</p> 



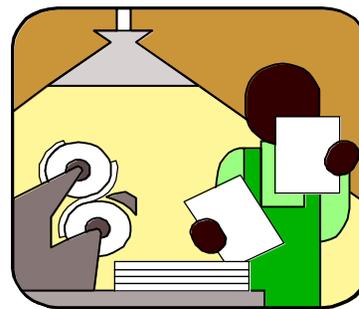
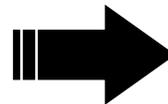
RPG Development Process



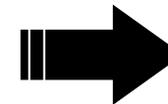
Synthesis continues while...



Alpha Version
October 15



Phase I
Beta Version
March 3



First Build
May 22



Build 1 Beta Reviewers

Reviewer

Emily Andrew

Dan Baltrus

Billy Barnes

Donald Bates

Conrad Bills

Doug Brooks

Frank Brunt

Mark Busby

Jennifer Chew

Candace Conwell

Virginia Dobey

Bruce Fairchild

Donna Gregg

Representing

BMDO

JSIMS

Air Force

JWARS

Industry

ASNE

JFCOM

NSMC

Army

Navy

OEA

Industry

NSA

Reviewer

Brian Hall

Sam Johnson

Bob Lutz

Gary Marchand

Terri Morgan

Dale Pace

George Phillips

Debra Ridgeway

Lynn Saunders

Maynard Schmale

Elaine Simmons

Walt Stanley

Janet Tang

Representing

COMOPTEVFOR

Air Force

Academia

Air Force

JSIMS

Academia

Navy

Army

JS

DIA

JDS

Industry

JNTF/NEST



Build 1 Beta Review Results

77% of reviewers responded

75% of assignments completed

100% of documents reviewed by at least two readers

Most documents reviewed by 3-4 readers



Quotable Quotes

Air Force

Special Topic: Conceptual Model “I think the document provides an excellent introduction to the topic.”

Army

“The VV&A RPG 2000, “the Living Document” is an excellent concept providing two-fold flexibility.”

Navy

“First reviews indicate the great potential of a focused, yet integrated, guide for M&S use, both at the model builder level and at the managerial level. “



Quotable Quotes cont'd

COMOPTEVFOR

Developer New: "The document was very well written."

NSA

Special Topic: SME

"Content was great. I specifically looked for (1) how to source SMEs, (2) how to train them, and (3) how to plan for them. All topics were covered."

JSIMS

Special Topics: "Documents are very concise and well organized."

V&V Agent New: "Very well written and organized."

JWARS

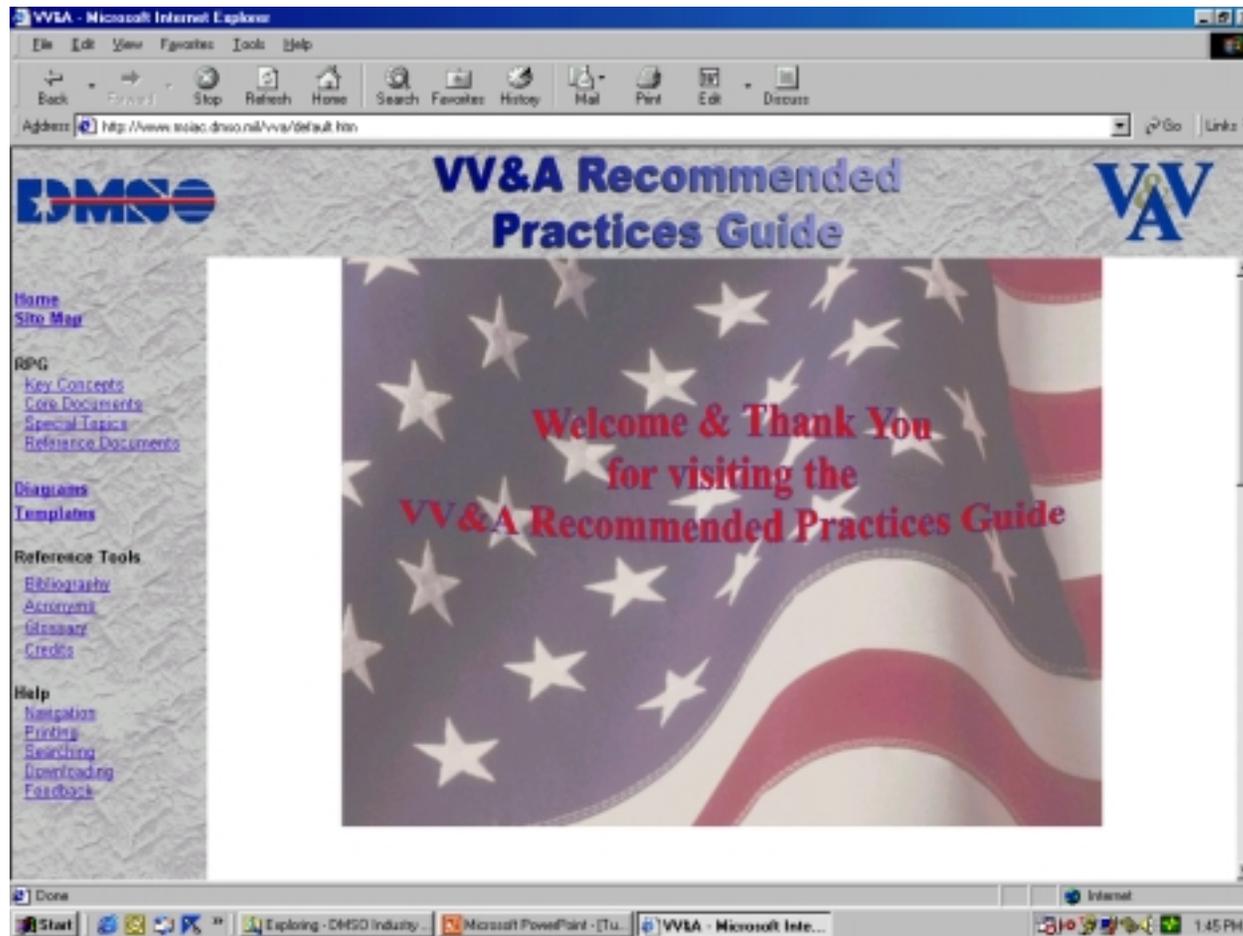
PM New: "I think the document looks solid after review... The core document looks well written and addresses the V&V process associated with an M&S project."

Industry

"I was surprised and delighted by the professional appearance and functioning of the RPG. This will be a product to be proud of."



RPG Year 2000 Edition Demo





VV&A Overview

This Recommended Practice Guide is focused on Verification, Validation, and Accreditation, which is referred to by its acronym “VV&A.” VV&A is a process of applying incremental review, analysis, evaluation, and testing to Modeling and Simulation (M&S) products to improve credibility.

Verification

“verification is the process of determining that a model implementation accurately represents the developer’s conceptual description and specifications.”

Validation

“the process of determining the degree to which a model is an accurate representation of the real world from the perspective of the intended uses of the model.”

Accreditation

“accreditation is the official certification that a model or simulation is acceptable for use for a specific application.”



Key Concepts

- VV&A Overview
- Why VV&A? Developing a Deeper Understanding of VV&A Benefits
- Significant Concepts and Characteristics of VV&A
- Key VV&A Roles and Responsibilities
- The M&S Process Diagram



Why VV&A? Developing a Deeper Understanding of VV&A Benefits



- Increased Confidence in M&S Use
- Earlier Detection of Errors and Defects
- Reduced Development Risk
- Life Cycle Cost Savings
- Improved Usability and Reuse
- Better Problem Solving and More Predictable Results
- Improved Documentation and Record Keeping
- Improved Project Communication, Visibility, & Coordination
- More Effective Software Configuration Management
- Satisfaction of Policy Requirements



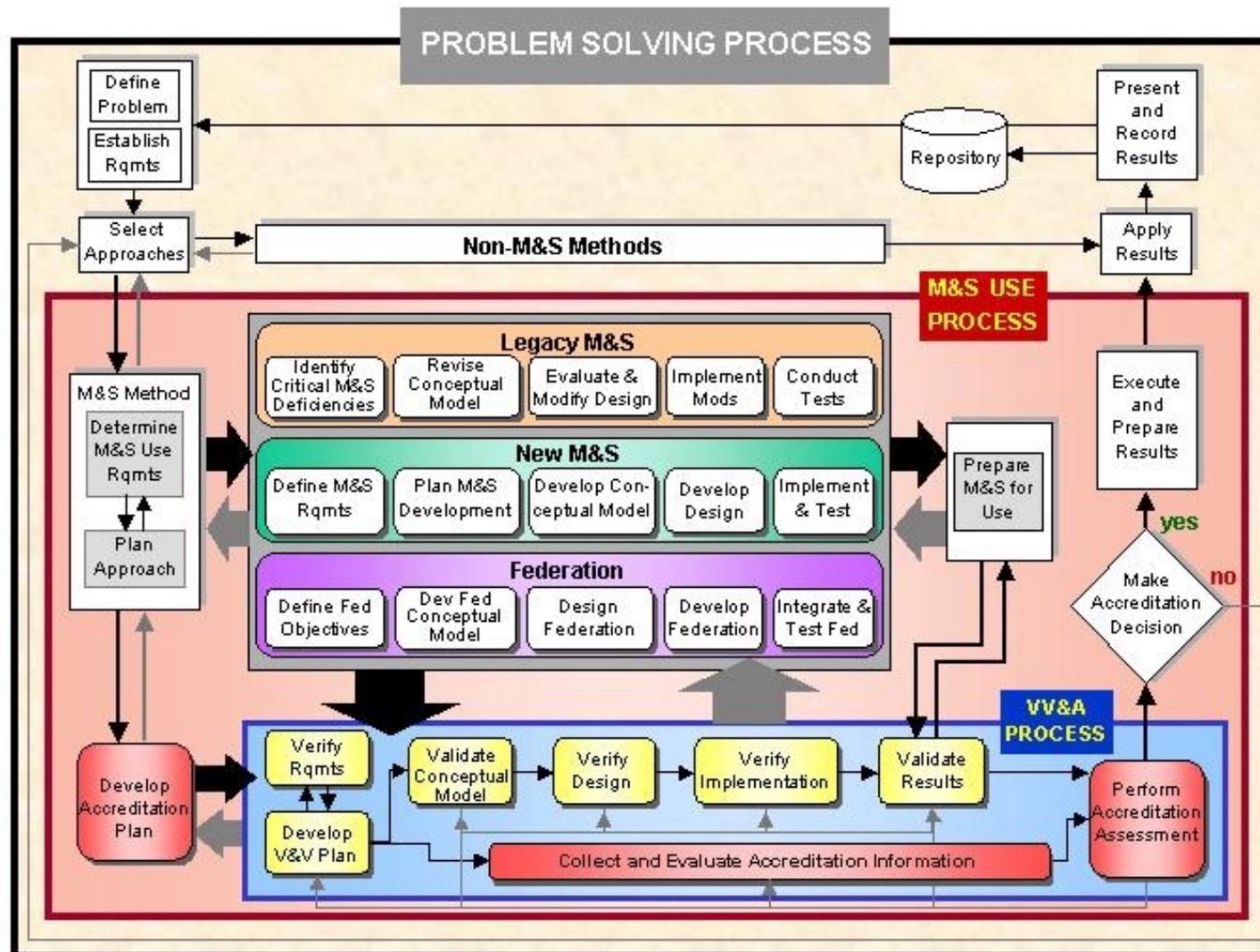
Significant Concepts and Characteristics of VV&A



- VV&A is not a “One Size Fits All” approach
- VV&A can be called the Conscience of Development
- Knowing when VV&A is complete
 - If the product is unchanged and the intended use is very similar to the last accreditation
 - If the product is unchanged and the intended use is different from the last accreditation
 - If the product has changed and has not had a new VV&A effort
 - If the product has changed and has had a new VV&A effort



The M&S Process Diagram



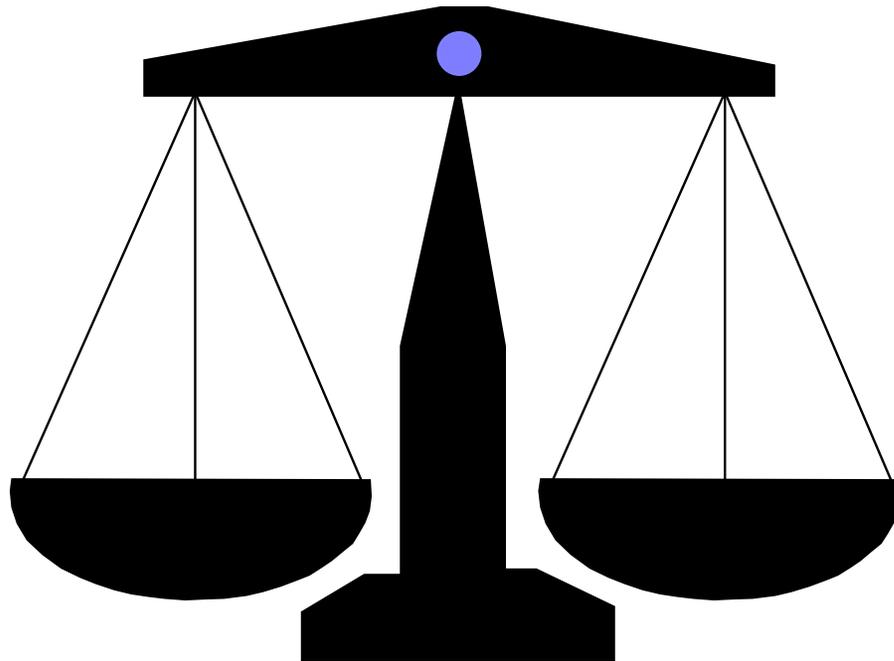


Key VV&A Roles and Responsibilities

- **M&S User**
 - The individual, group, or organization that utilizes the results or products from a specific application of a model or simulation.
- **M&S Program Manager**
 - The individual, group, or organization that is in charge of the programmatic and managerial aspects of a simulation development.
- **M&S Developer**
 - The individual, group, or organization responsible for managing or overseeing models and simulations developed by a DoD Component, contractor, or Federally Funded Research and Development Center.
- **V&V Agent**
 - The organic asset, external organization, or contractor designated by the M&S PM to perform verification and/or validation of a model, simulation, or federation of M&S.
- **Accreditation Agent**
 - The individual, group, or organization that conducts the accreditation assessment of a specific M&S application.



BREAK



10 minutes



User



Bob Senko
Industry
DMSO Support

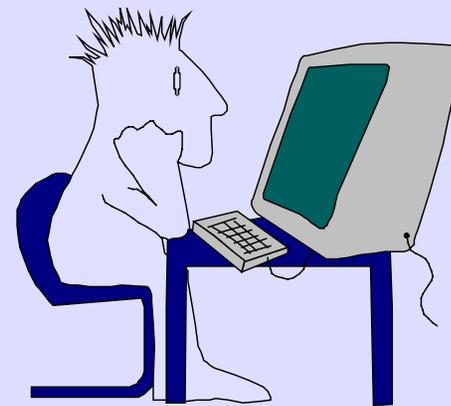


Developer

Mike Metz

Industry

STOW, JWARS, JSIMS,
JCOS





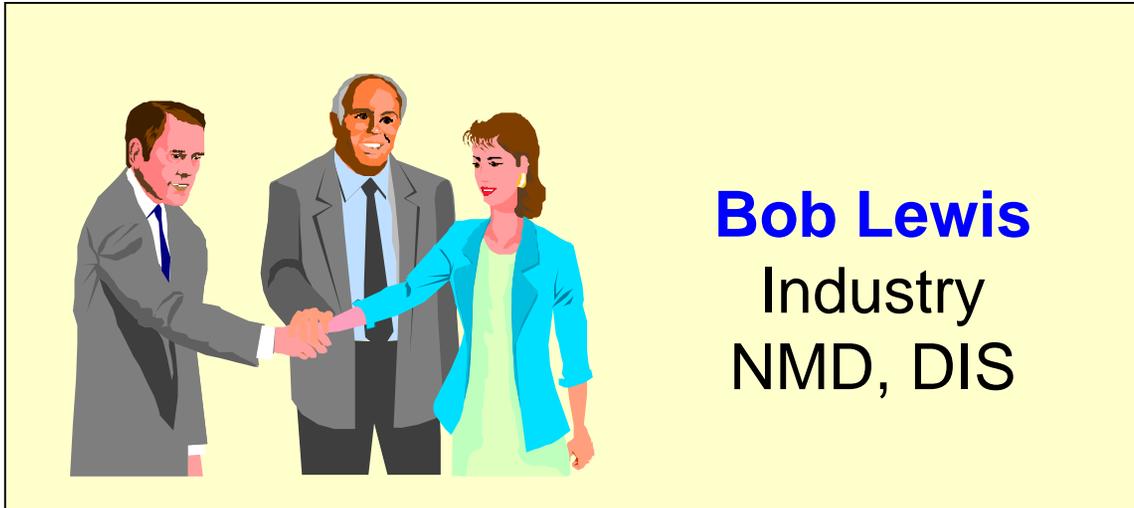
M&S Program Manager

Terry Prosser
Industry
JWARS, C4ISR
Dave Hoffman
Gov't





V&V Agent

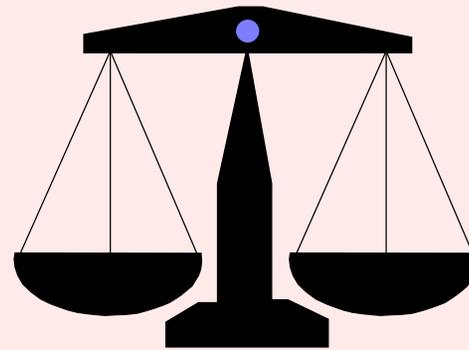


Bob Lewis
Industry
NMD, DIS



Accreditation Agent

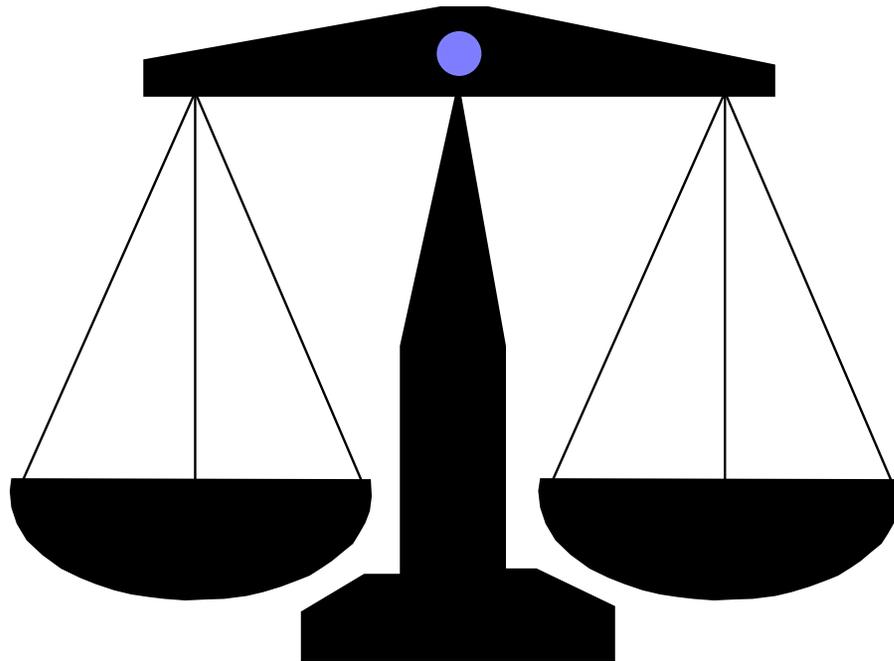
Paul Muessig
Gov't
Director, JASA



represented by **Marti Hoppus**



BREAK



10 minutes



Time Line

Build 1 22 May 2000

- “new development” core documents
- special topic papers and reference papers

Build 2 Aug 2000

- “legacy” core documents
- additional special topics & reference papers, as needed

Build 3 Dec 2000

- “federation” core documents
- additional special topics & reference papers, as needed