

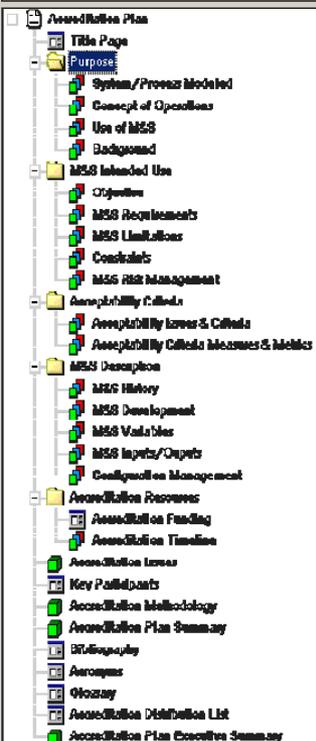


DoD VV&A Documentation Tool (VDT)

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CBIS Conference Jan 2007

Project Explorer



Editor - Purpose

- Background
 - Evaluating M&S
 - Role of VV&A
- Overview of the VV&A Documentation Tool (VDT)
- Benefits of the VDT
- Summary of the VDT

Purpose

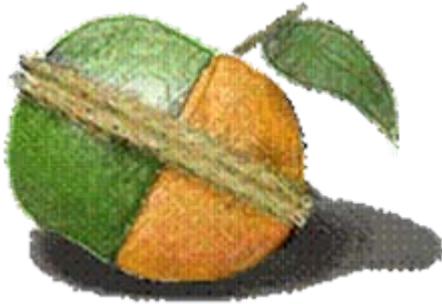
Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.



Introduction & Background

Complications with Using M&S

Scenario 1: Selecting Individual M&S



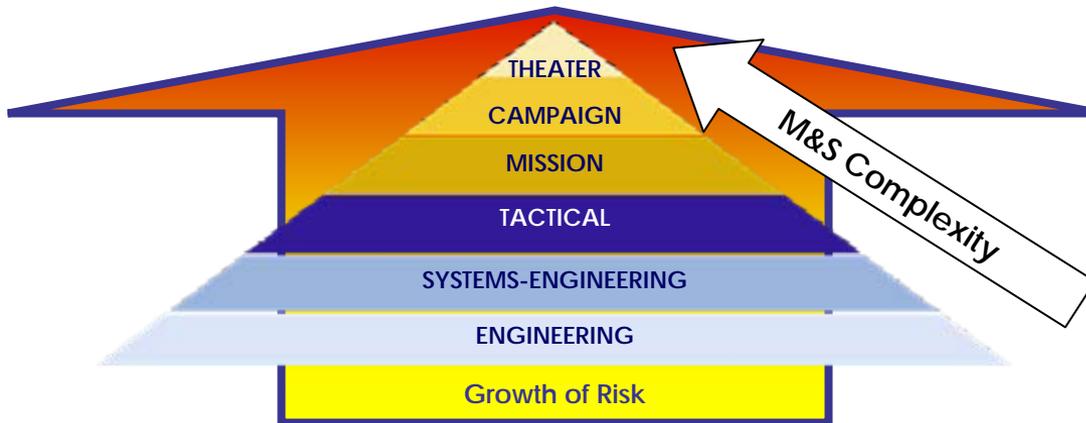
Stress Factors:
 Finding the "best fit"
 Compressed delivery schedule

Scenario 2: Reuse & Modularity



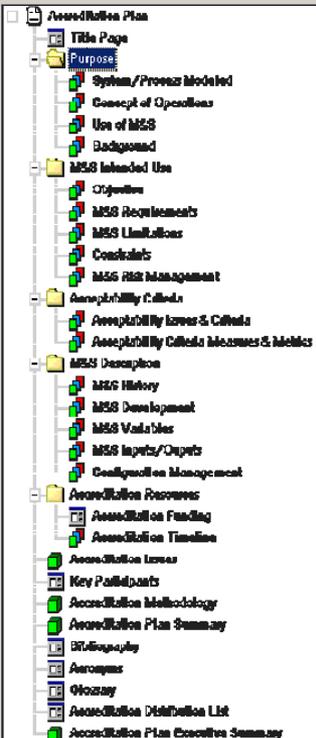
Stress Factors:
 Assessment strategy for module compatibility
 Limited understanding of the M&S modules

Scenario 3: System Complexity & Risk



Stress Factors:
 Risk rises with system complexity

Purpose
 Describe, in g
 the purpose fo
 support.



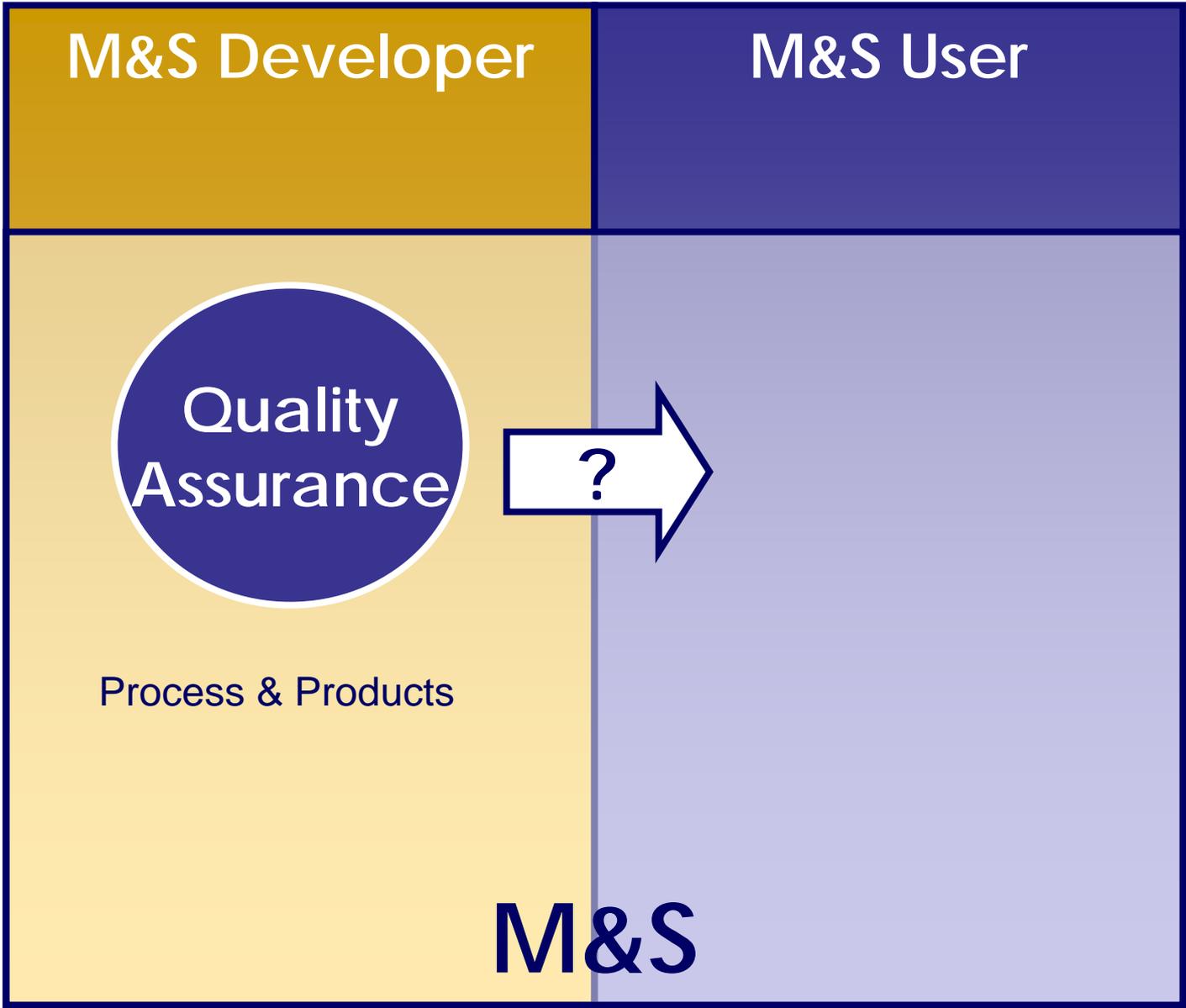
- 1st Order (High): Capabilities/ Performance
- 2nd Order (Middle): Systems Engineering/ Design
- 3rd Order (Low): Implementation/ Testing

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

- Accreditation Plan
 - Title Page
 - Purpose
 - System/Process Modeled
 - Concept of Operations
 - Use of M&S
 - Background
 - M&S Intended Use
 - Objectives
 - M&S Requirements
 - M&S Limitations
 - Constraints
 - M&S Risk Management
 - Acceptability Criteria
 - Acceptability Issues & Criteria
 - Acceptability Criteria Measures & Metrics
 - M&S Description
 - M&S History
 - M&S Development
 - M&S Variables
 - M&S Inputs/Outputs
 - Configuration Management
 - Accreditation Processes
 - Accreditation Funding
 - Accreditation Timeline
 - Accreditation Issues
 - Key Participants
 - Accreditation Methodology
 - Accreditation Plan Summary
 - Bibliography
 - Acronyms
 - Glossary
 - Accreditation Distribution List
 - Accreditation Plan Executive Summary

Editor - Purpose

VV&A and Quality Assurance

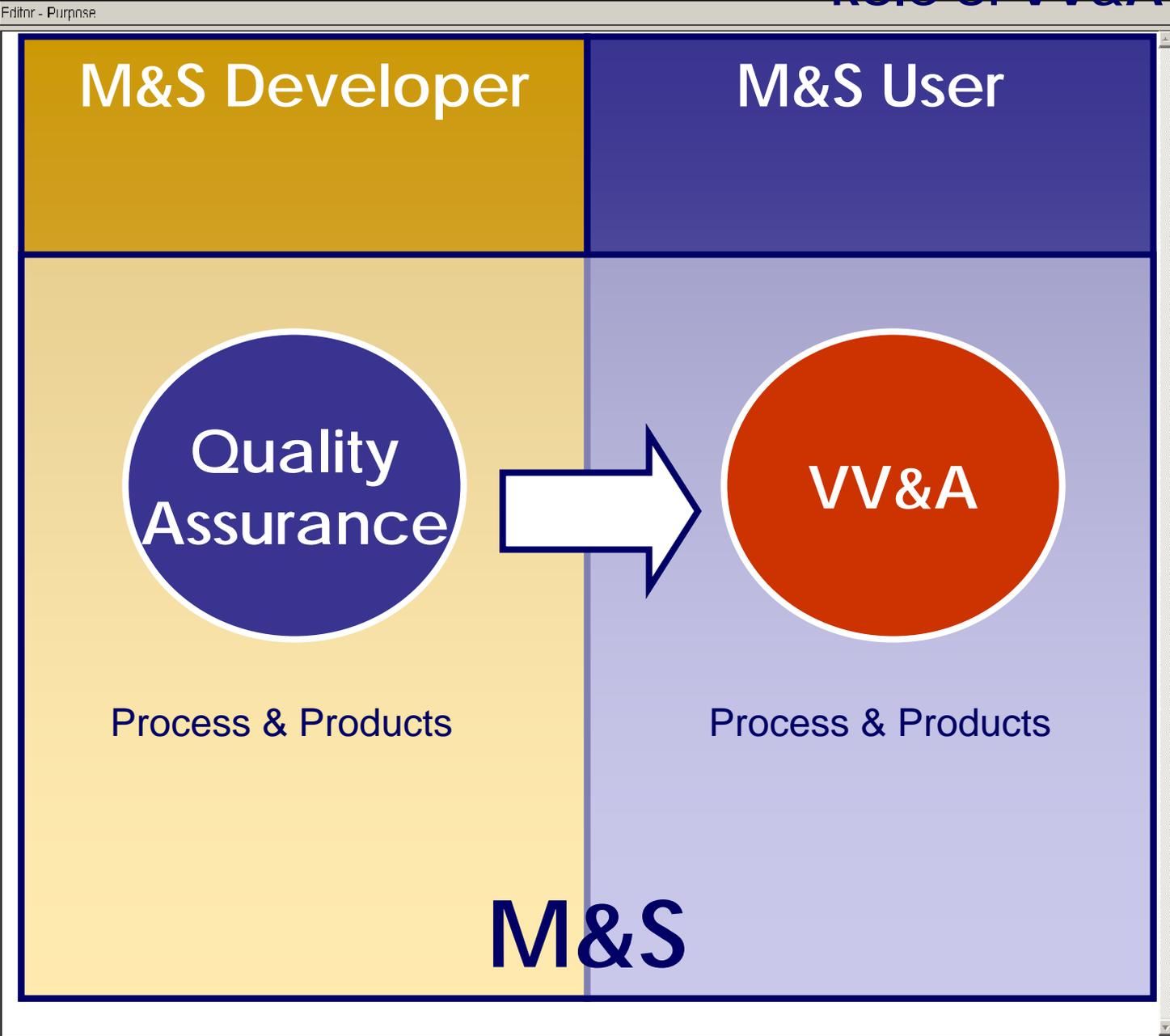


Purpose

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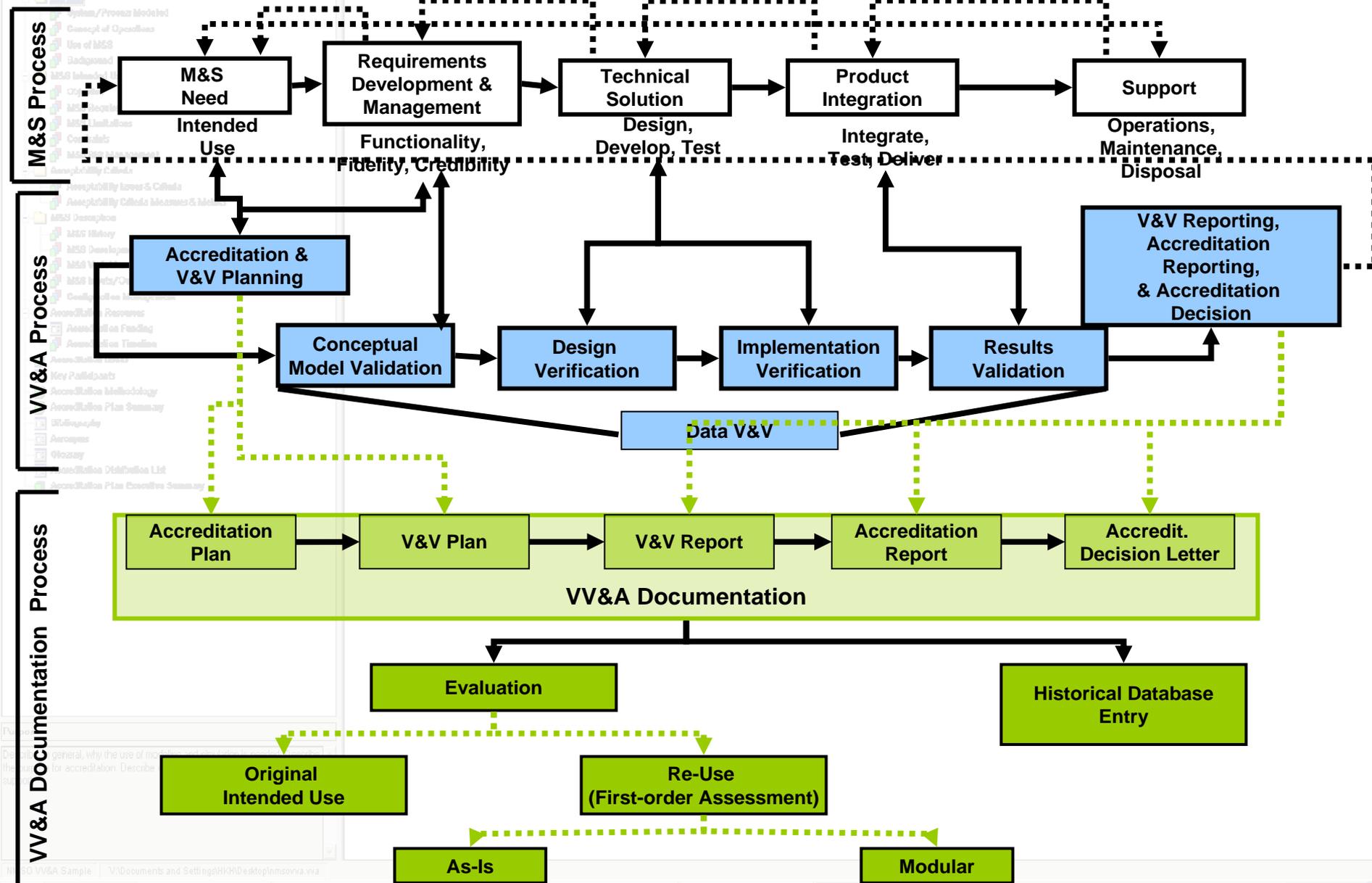
Project Explorer

- Assessment Plan
 - Title Page
 - Purpose
 - System/Process Modeled
 - Concept of Operations
 - Use of M&S
 - Background
 - M&S Intended Use
 - Objectives
 - M&S Requirements
 - M&S Limitations
 - Constraints
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 - Acceptability Criteria
 - Acceptability Issues & Criteria
 - Acceptability Criteria Measures & Metrics
 - M&S Description
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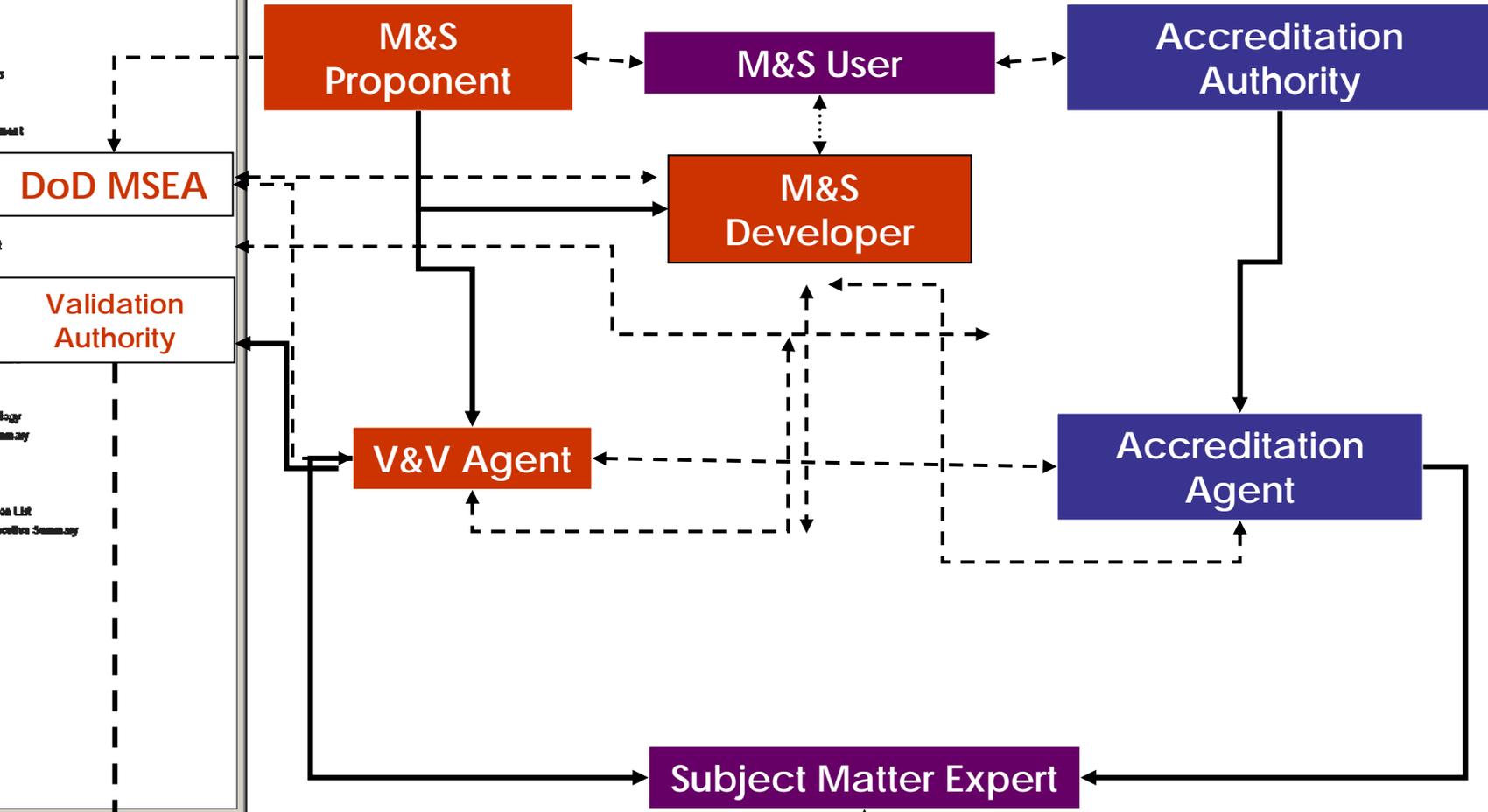
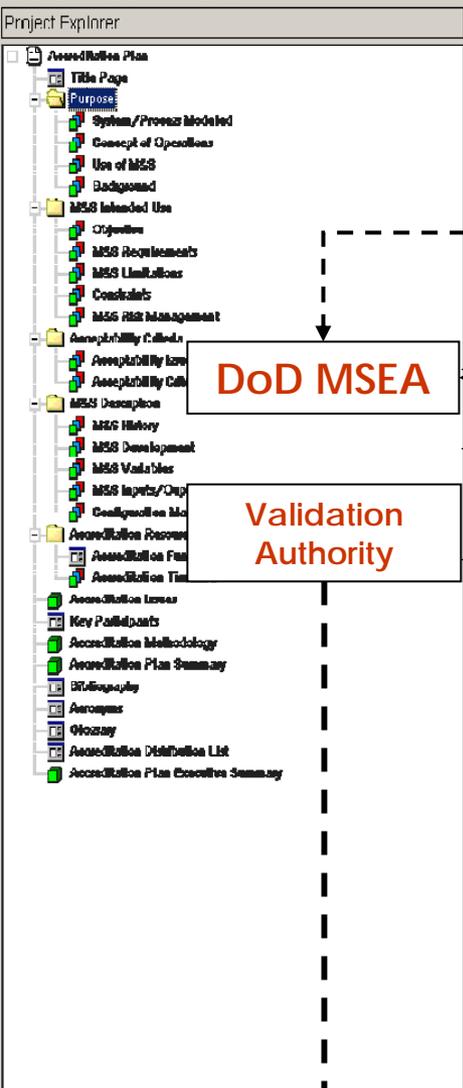
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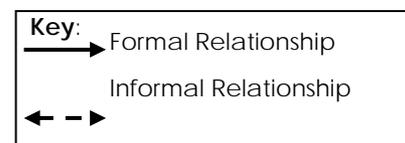


Role Relationships

Editor - Purpose



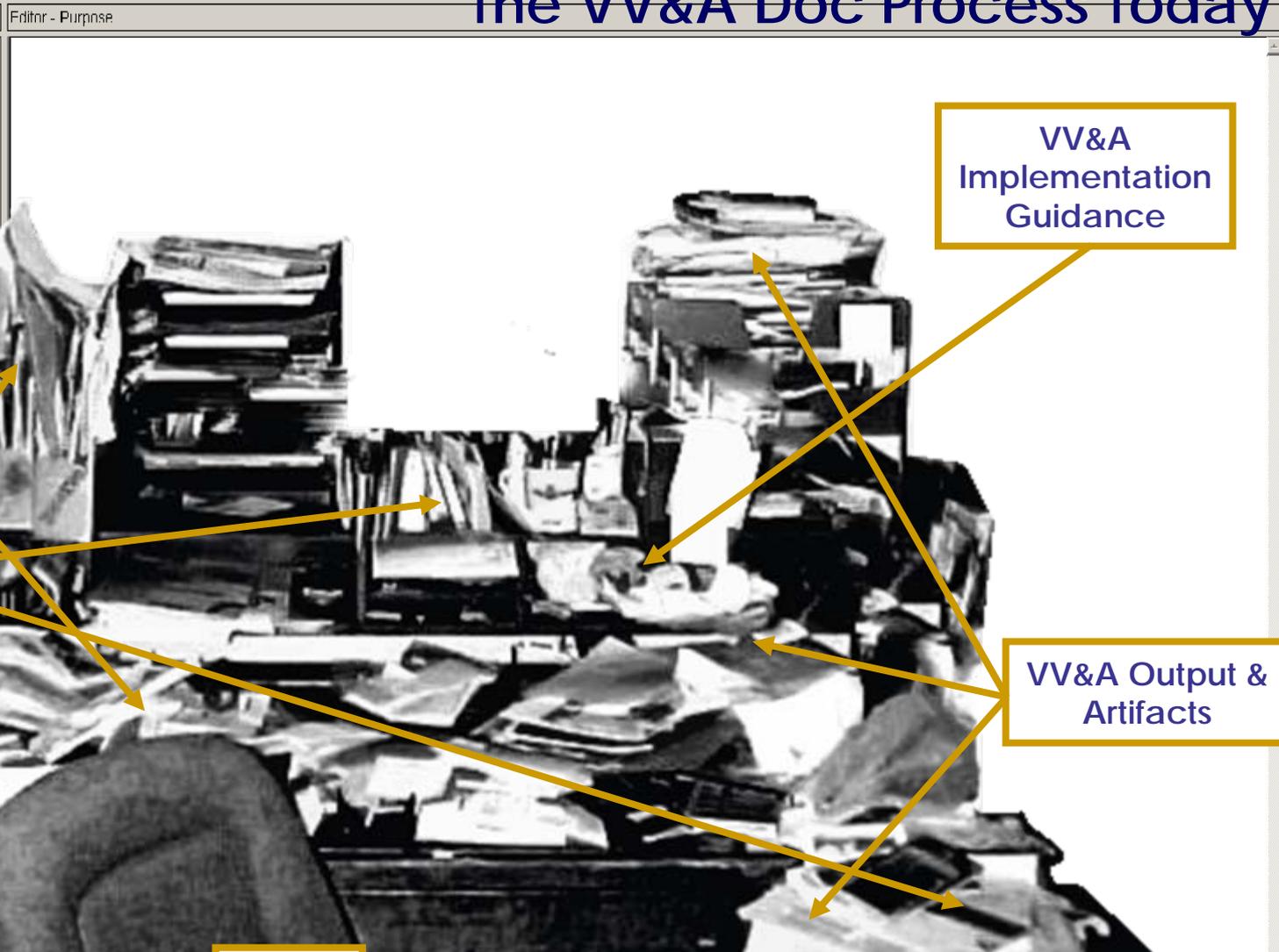
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The VV&A Doc Process Today

Project Explorer

- Accreditation Plan
 - Title Page
 - Purpose
 - System/Process Modeled
 - Concept of Operations
 - Use of M&S
 - Background
 - M&S Intended Use
 - Objectives
 - M&S Requirements
 - M&S Limitations
 - Configuration Management
 - Accreditation Procedures
 - Accreditation Funding
 - Accreditation Timeline
 - Other
 - History
 - Accreditation Distribution List
 - Accreditation Plan Executive Summary



VV&A Policy

M&S Documentation

VV&A Implementation Guidance

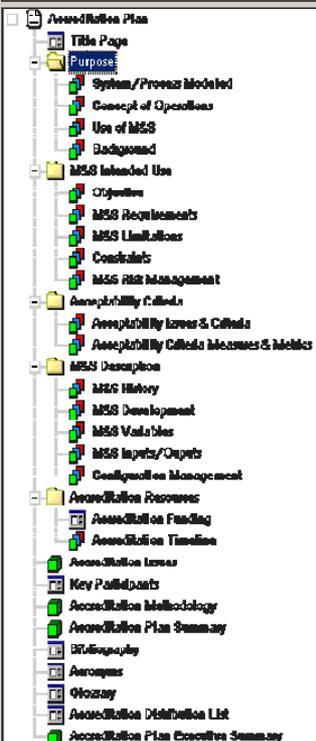
VV&A Output & Artifacts

Author

Purpose

Describe, in general, why the use of modeling and simulation is needed to achieve the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Project Explorer



Editor - Purpose

The DoD needed a way to:

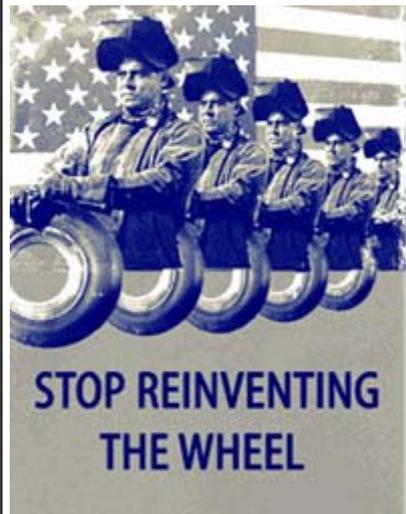
- Ensure compliance with policy and guidance
- Guide users through the VV&A process
- Ensure all VV&A documentation is accurate and consistent
- Expedite the VV&A documentation process for implementers through automation
- Standardize VV&A documentation

Purpose

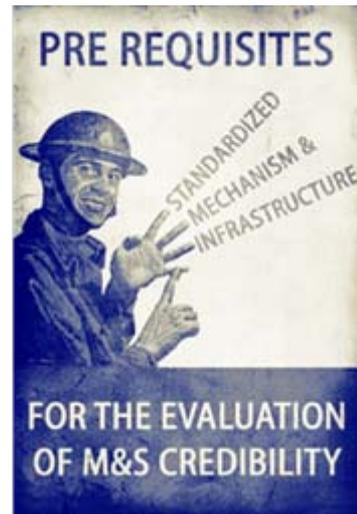
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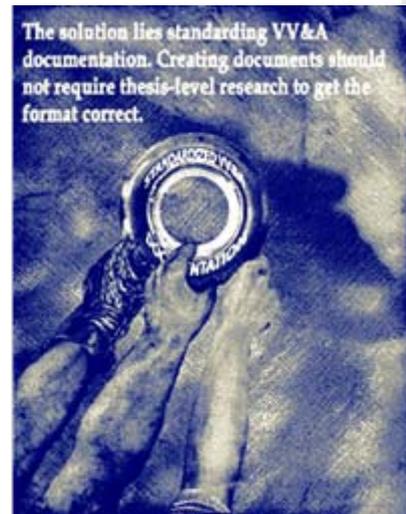
Editor - Purpose



Streamline:
Standardize the Process by Using Automated Tools



Pre-Requisites:
A standardized mechanism and infrastructure for the evaluation of M&S credibility

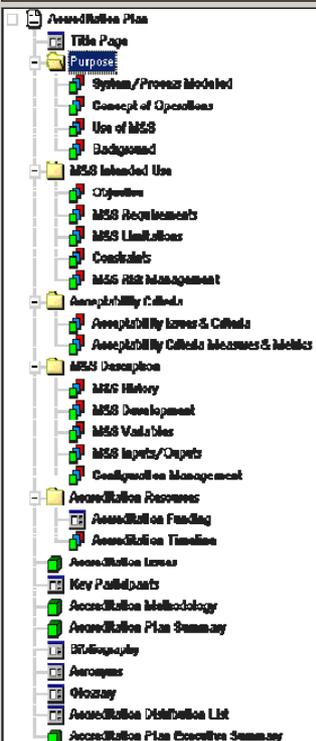


Solution:
Standardize VV&A Documentation

Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Project Explorer



Editor - Purpose

- DoD and Military Standards
- CMMI
- Commercial and International Standards
 - IEEE
 - ISO
- Engineering
 - Requirements
 - Software and Hardware
 - Systems
- Software V&V
- Programs with Successful VV&A



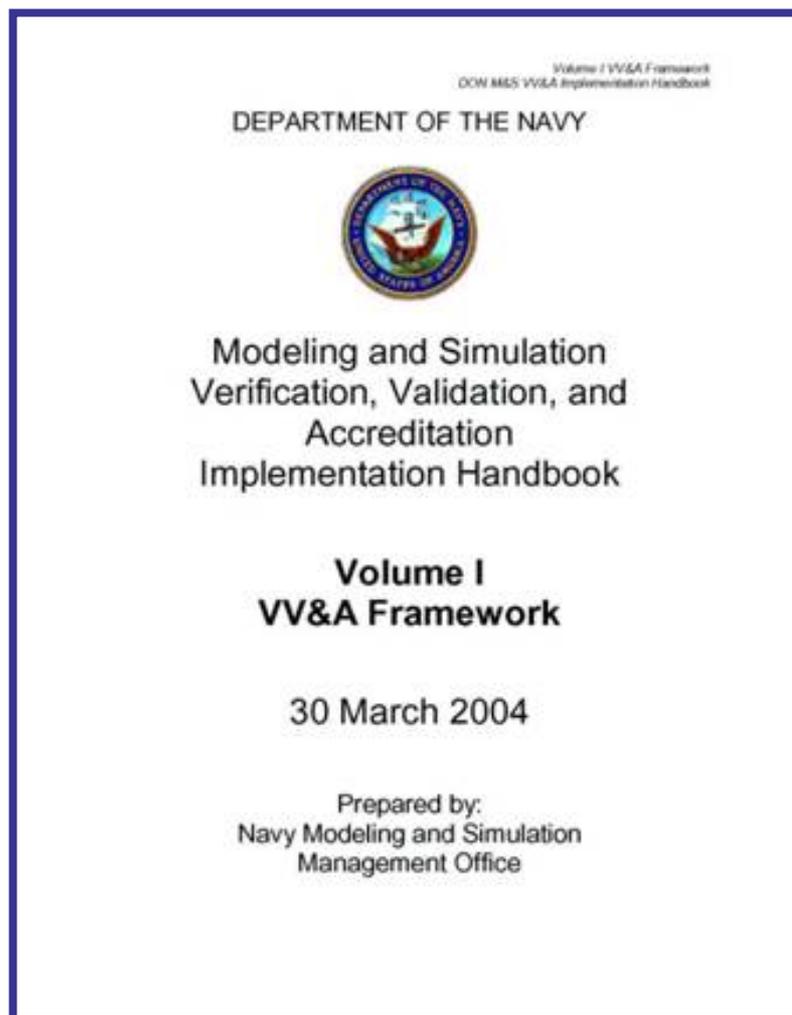
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Editor - Purpose



Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Practiced by: PEO-IWS, PEO-Carriers, etc.

Project Explorer

- Assess/Review Plan
 - Title Page
 - Purpose
 - System/Process Modeled

Editor - Purpose

DRAFT

DEPARTMENT OF THE NAVY



**Standard Templates
for
VV&A Documentation**

28AUG2005

Prepared by:
Navy Modeling and Simulation Office

DRAFT

TABLE OF CONTENTS

1. INTRODUCTION	4
2. VV&A DOCUMENTATION TOOL	4
3. ACCREDITATION PLAN TEMPLATE	4
ACCREDITATION PLAN EXECUTIVE SUMMARY	4
1. PURPOSE	4
a. System/Process Modeled	4
b. Concept of Operations	4
c. Use of MSS	4
2. BACKGROUND	4
a. References	4
b. Definitions	4
c. Constraints	4
3. MSS INTENDED USE	4
a. Objective	4
b. MSS Requirements	4
c. MSS Limitations	4
d. MSS Risk Management	4
4. ACCEPTABILITY CRITERIA	4
a. Acceptability Issues & Criteria	4
b. Acceptability Criteria Measures & Metrics	4
5. MSS DESCRIPTION	4
a. MSS History	4
b. MSS Development	4
c. MSS Variables	4
d. MSS Inputs/Outputs	4
e. Configuration Management	4
6. ACCREDITATION RESOURCES	4
a. Accreditation Funding	4
b. Accreditation Timeline	4
7. ACCREDITATION ISSUES	4
8. KEY PARTICIPANTS	4
a. Accreditation Participants	4
1. Accreditation Authority	4
2. Accreditation Agent	4
3. Accreditation Team	4
b. USV Participants	4
1. MSS Proponent	4
2. USV Agent	4
3. Validation Authority	4
4. Authoritative Data Source	4
c. MSS Development Participants	4
1. MSS Developer	4

A-1
PAGE

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TABLE OF CONTENTS

1. INTRODUCTION	4
2. VV&A DOCUMENTATION TOOL	4
3. ACCREDITATION PLAN TEMPLATE	4
ACCREDITATION PLAN EXECUTIVE SUMMARY	4
1. PURPOSE	4
a. System/Process Modeled	4
b. Concept of Operations	4
c. Use of MSS	4
2. BACKGROUND	4
a. References	4
b. Definitions	4
c. Constraints	4
3. MSS INTENDED USE	4
a. Objective	4
b. Mission/Requirement	4
c. Methodology	4
d. Mission/Model	4
ACCEPTABILITY CRITERIA	4
a. Acceptability Issues & Criteria	4
b. Acceptability Criteria Measures & Metrics	4
4. MSS DESCRIPTION	4
a. MSS History	4
b. MSS Development	4
c. MSS Variables	4
d. MSS Inputs/Outputs	4
e. Configuration Management	4
5. ACCREDITATION RESOURCES	4
a. Accreditation Funding	4
b. Accreditation Timeline	4
6. ACCREDITATION ISSUES	4
7. KEY PARTICIPANTS	4
a. Accreditation Participants	4
1. Accreditation Authority	4
2. Accreditation Agent	4
3. Accreditation Team	4
b. USV Participants	4
1. MSS Proponent	4
2. USV Agent	4
3. Validation Authority	4
4. Authoritative Data Source	4
c. MSS Development Participants	4
1. MSS Developer	4

A-1

VDT - Soon to be Converted to DoD Templated

M&S Requirements Acceptability Criteria

Test Areas & Assessment Tasks of M&S Fidelity

3. ACCREDITATION PLAN TEMPLATE

ACCREDITATION PLAN EXECUTIVE SUMMARY. *"What is the overall purpose of the Accreditation Plan?" The Accreditation Plan provides the executive with an introduction to the Accreditation Plan, leaving granular details to the body of the document. This section is a précis of the major elements from all sections, emphasizing Sections 3, 4, and 7. The Executive Summary is the last section to be written and should be no longer than two-four pages, as no material is provided that is not covered in greater detail in the body of the document. The Executive Summary should be a stand-alone document.*

Upon review, does the Executive Summary:

- Function as a stand-alone document?
- Provide a condensed précis of the Accreditation Plan?
- Exclusively provide information that is covered in the body of the Accreditation Plan?

1. PURPOSE. *"Why is the use of M&S required?" and "What is the purpose of the accreditation?" This section details the context of M&S use and the purpose for the accreditation. This section provides a broad overview of the environment into which M&S will be inserted: program overview, program objectives, background information regarding the need for M&S to meet particular program objectives, etc. The Purpose Section and its subsections (System/Process Modeled, Concept of Operations, and Use of M&S) provide high-level overviews justifying the use of M&S generally and should not address the particular M&S specifically.*

a. System/Process Modeled. *"What is the system or process being modeled?" This subsection describes in detail the system or process that is being modeled or simulated, including the role the system/process will play in the overall program with respect to the program's objectives and goals. The System/Process Modeled provides a high-level overview justifying the use of M&S generally and should not address the particular M&S specifically.*

b. Concept of Operations. *"What is the concept of operations, or conceptual overview, for how the system/process being modeled will be used?" This subsection describes the program's concept of operations with respect to the environment in which the M&S will be inserted. The DoD Dictionary of Military Terms defines the Concept of Operations as "a verbal or graphic statement, in broad outline, of a commander's assumptions or intent in regard to an operation or series of operations.... The concept is designed to give an overall picture of the operation." The Concept of Operations provides a high-level conceptual overview justifying the use of M&S generally and should not address the particular M&S specifically.*

c. Use of M&S. *"How will M&S be applied in the program?" This subsection provides a detailed justification for the use of M&S. The justification should include how M&S will be incorporated into the overall program and the program objectives its use will fulfill, such as the expected output, how the output data will be applied in*

4. VERIFICATION AND VALIDATION PLAN TEMPLATE

V&V PLAN EXECUTIVE SUMMARY. *"What is the overall purpose of the V&V Plan?" The V&V Plan provides the executive with an introduction to the V&V Plan, leaving granular details to the body of the document. This section is a précis of the major elements from all sections, emphasizing Sections, 2, 3, and 7. The Executive Summary is the last section to be written and should be no longer than four pages, as no material is provided that is not covered in greater detail later in the document.*

Upon review, does the Executive Summary:

- Provide a condensed précis of the body of the V&V Plan?
- Function as a stand-alone document, providing a broad yet accurate overview of the V&V Plan as a whole?
- Exclusively provide information that is covered in the body of the V&V Plan?

1. PURPOSE. *"Why is the use of M&S required?" and "What is the purpose of the V&V?" This section details the context of M&S use and the purpose for the V&V. This section provides a broad overview of the environment into which M&S will be inserted: program overview, program objectives, background information regarding the need for M&S to meet particular program objectives, etc. The Purpose Section and its subsections (System/Process Modeled, Concept of Operations, and Use of M&S) provide high-level overviews justifying the use of M&S generally and should not address the particular M&S specifically.*

(As the information in this entire section is common to all four of the core documents, this section may be leveraged from the Accreditation Plan.)

a. System/Process Modeled. *"What is the system or process being modeled?" This subsection describes in detail the system or process that is being modeled or simulated, including the role the system/process will play in the overall program with respect to the program's objectives and goals. The System/Process Modeled provides a high-level overview justifying the use of M&S generally and should not address the particular M&S specifically.*

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c. Use of M&S. *"How will M&S be applied in the program?" This subsection provides a detailed justification for the use of M&S. The justification should include*

Report on Inspect Results

Report on M&S Acceptability

5. VERIFICATION AND VALIDATION REPORT TEMPLATE

V&V REPORT EXECUTIVE SUMMARY. *"What is the overall purpose of the V&V Report?" The V&V Report provides the executive with an introduction to the V&V Report, leaving granular details to the body of the document. This section is a précis of the major elements from all sections, emphasizing Sections, 3, 4, 5, and 7. The Executive Summary is the last section to be written and should be no longer than four pages, as no material is provided that is not covered in greater detail later in the document.*

Upon review, does the Executive Summary:

- Provide a condensed précis of the body of the Accreditation Plan?
- Function as a stand-alone document, providing a broad yet accurate overview of the Accreditation Plan as a whole?
- Exclusively provide information that is covered in the body of the Accreditation Plan?

1. PURPOSE. *"Why is the use of M&S required?" and "What is the purpose of the accreditation?" This section details the context of M&S use and the purpose for the accreditation. This section provides a broad overview of the environment into which M&S will be inserted: program overview, program objectives, background information regarding the need for M&S to meet particular program objectives, etc. The Purpose Section and its subsections (System/Process Modeled, Concept of Operations, and Use of M&S) provide high-level overviews justifying the use of M&S generally and should not address the particular M&S specifically.*

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- a. System/Process Modeled.** *"What is the system or process being modeled?" This subsection describes in detail the system or process that is being modeled or simulated, including the role the system/process will play in the overall program with respect to the program's objectives and goals. The System/Process Modeled provides a high-level overview justifying the use of M&S generally and should not address the particular M&S specifically.*
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7. ACCREDITATION REPORT TEMPLATE

ACCREDITATION REPORT EXECUTIVE SUMMARY. *"What is the overall purpose for the Accreditation Report?" The Accreditation Report provides the executive with an introduction to the Accreditation Report, leaving granular details to the body of the document. This section is a précis of the major elements from all sections, emphasizing Sections 3, 4, and 5. The Executive Summary is the last section to be written and should be no longer than eight pages in length, as no material is provided that is not covered in greater detail later in the document.*

Upon review, does the Executive Summary:

- Provide a condensed précis of the body of the Accreditation Report?
- Function as a stand-alone document, providing a broad yet accurate overview of the Accreditation Report as a whole?
- Exclusively provide information that is covered in the body of the Accreditation Report?

1. PURPOSE. *"Why is the use of M&S required?" and "What is the purpose of the accreditation?" This section details the context of M&S use and the purpose for the accreditation. This section provides a broad overview of the environment into which M&S will be inserted: program overview, program objectives, background information regarding the need for M&S to meet particular program objectives, etc. The Purpose Section and its subsections (System/Process Modeled, Concept of Operations, and Use of M&S) provide high-level overviews justifying the use of M&S generally and should not address the particular M&S specifically.*

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Overview of the VDT

- Accreditation Plan
 - Title Page
 - Purpose
 - System/Process Modeled
 - Concept of Operations
 - Use of M&S
 - Background
 - M&S Intended Use
 - Objectives
 - M&S Requirements
 - M&S Limitations
 - Constraints
 - M&S Risk Management
 - Availability Related
 - Availability Issues & Criteria
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 - M&S Description
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 - Accreditation Distribution List
 - Accreditation Plan Executive Summary

"Policies, standards, process, VV&A, and use-specific databases" -RAND



DoD Users



M&S Public Info.

Infrastructure = VDT

Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Project Explorer

- Accreditation Plan
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 - Use of M&S
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“Policies, standards, process, VV&A, and use-specific databases” -RAND

VV&A Documentation Tool



Join the Navy in strengthening the VV&A community!

Navy Users



M&S Public Info.



SECNAVINST 5200.40
DON M&S VV&A Implementation Handbook, Vol.1
Standard Templates for VV&A Documentation

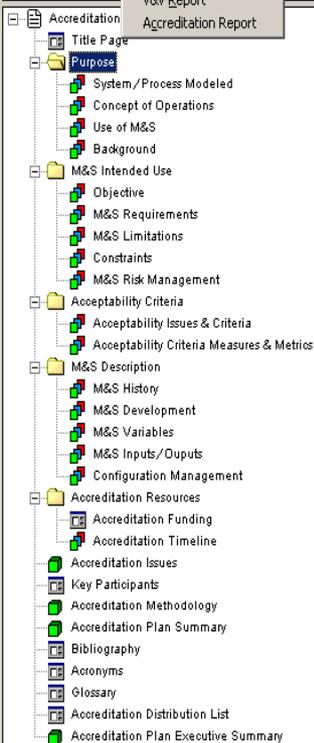
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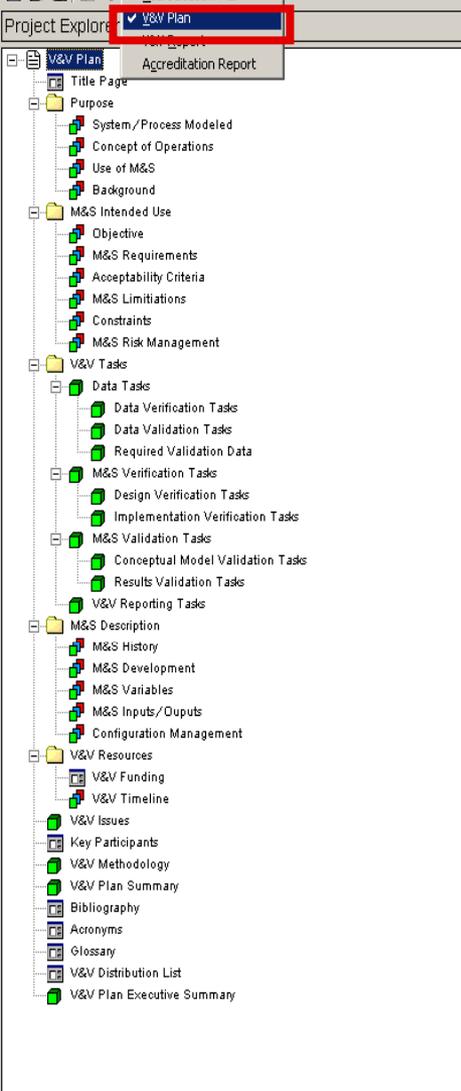
Editor - Purpose



- From M&S Development to M&S Fidelity:
 - Accreditation Plan
 - M&S Requirements
 - Acceptability Criteria

Purpose

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• From M&S Development to M&S Fidelity:

– Accreditation Plan

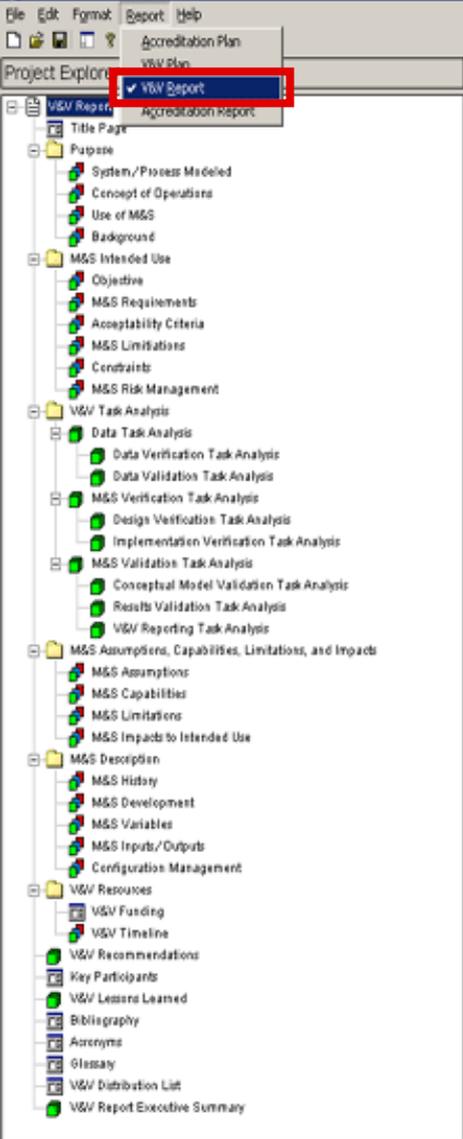
- M&S Requirements

- Acceptability Criteria

– V&V Plan

- Test Areas

- Tasks to Test M&S Fidelity



- From M&S Development to M&S Fidelity:
 - Accreditation Plan
 - M&S Requirements
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 - V&V Plan
 - Test Areas
 - Tasks to Test M&S Fidelity
 - V&V Report
 - Inspection Results

- Accreditation Report
- Title Page
- Purpose
 - System/Process Modeled
 - Concept of Operations
 - Use of M&S
 - Background
- M&S Intended Use
 - Objective
 - M&S Requirements
 - M&S Limitations
 - Constraints
 - M&S Risk Management
- Accreditation Assessment
- M&S Assumptions, Capabilities, Limitations, and Impacts
 - M&S Assumptions
 - M&S Capabilities
 - M&S Limitations
 - M&S Impacts to Intended Use
- M&S Description
 - M&S History
 - M&S Development
 - M&S Variables
 - M&S Inputs/Outputs
 - Configuration Management
- Accreditation Resources
 - Accreditation Funding
 - Accreditation Timeline
- Accreditation Recommendations
- Key Participants
- Accreditation Lessons Learned
- Bibliography
- Acronyms
- Glossary
- Accreditation Distribution List
- Accreditation Report Executive Summary

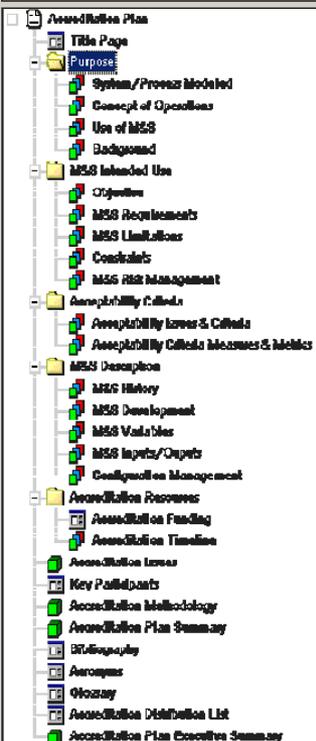
- From M&S Development to M&S Fidelity:
 - Accreditation Plan
 - M&S Requirements
 - Acceptability Criteria
 - V&V Plan
 - Test Areas
 - Tasks to Test M&S Fidelity
 - V&V Report
 - Inspection Results
 - Accreditation Report
 - Results of Acceptability Assessment

Accreditation Report



Benefits of the VDT

Project Explorer



Editor - Purpose

- Standardizes and automates production of VV&A documentation
- Supports VV&A policy and guidance
- Promotes M&S Reuse
- Leverages web-based and XML technologies
- User friendly; what you see is what you get

Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

M&S VDT Portal Login

US Department of Defense Warning Statement

This is a Department of Defense computer system. This computer system, including all related equipment, networks and network devices (specifically including Internet access), are provided only for authorized U. S. Government use. DoD computer systems may be monitored for all lawful purposes, including to ensure that their use is authorized, for management of the system, to facilitate protection against unauthorized access, and to verify security procedures, survivability and operational security. Monitoring includes active attacks by authorized DoD entities to test or verify the security of this system. During monitoring, information may be examined, recorded, copied and used for authorized purposes. All information, including personal information, placed on or sent over this system may be monitored. Use of this DoD computer system, authorized or unauthorized, constitutes consent to monitoring of this system. Unauthorized use may subject you to criminal prosecution. Evidence of unauthorized use collected during monitoring may be used for administrative, criminal or adverse action. Use of this system constitutes consent to monitoring for these purposes

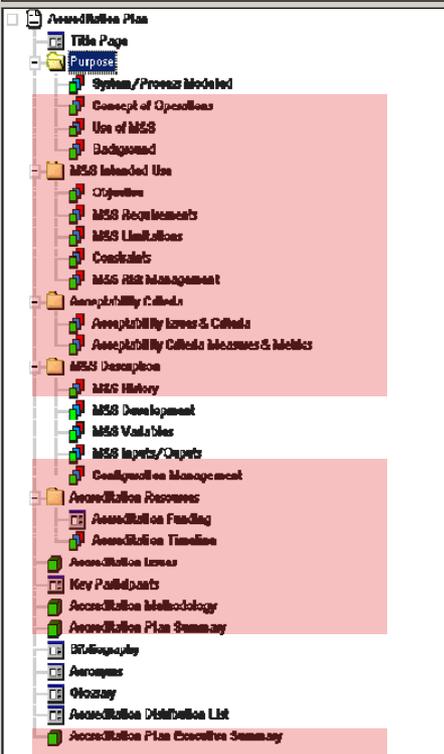
User Name:

Password:

Login

DON: Conformity to DOD network security standards
Users: Transparency of information among team members
while preserving security for proprietary information

Project Explorer



Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Editor - Purpose

- DOD
 - Consistent information across all documents
 - Data capture to the NMSIS
- User
 - Elimination of Redundant Data Entry

As a data-aware application, common information regarding the M&S (Description, CONOPs, Use History, etc) are propagated across all four documents, reducing the resources expended on repetitive reporting of duplicate information. Further, this M&S metadata will be captured in the M&S Repository.



Online Collaboration

Conference Details x **VV&A Documentation Tool 2.1**

File Edit Format Report Help

Project Explorer

Editor - Accreditation Plan

In Conference

- Marcy Stalman (marcy@vradm.gov)
- Christa Ealy (christae@vradm.gov)
- Ang Telle (atelle@vradm.gov)
- David Engler (dengler@vradm.gov)
- Greg Gunderfelt (gunderfelt@vradm.gov)
- Mark P. Pless (mpless@vradm.gov)
- Joseph Forstak (jforstak@vradm.gov)
- Help Desk (helpdesk@vradm.gov)
- Frank Schwartzberg (schwartz@vradm.gov)
- Susan Todd (stodd@vradm.gov)
- Lara McQueen (lmcqueen@vradm.gov)
- Bill Lucas (blucas@vradm.gov)

Not in Conference

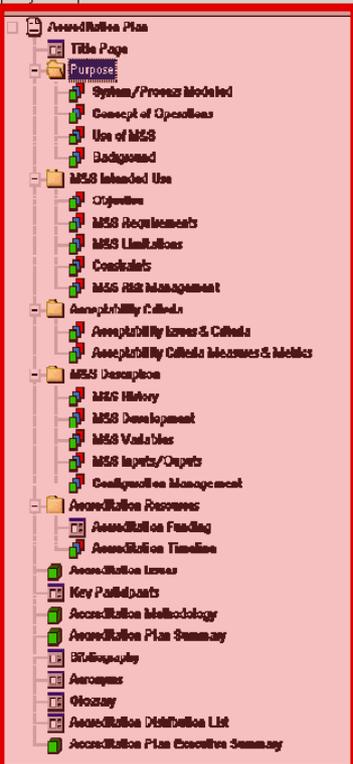
Accreditation Plan

- Title Page
- Purpose
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 - Background
- M&S Intended Use
 - Objective
 - M&S Requirements
 - M&S Limitations
 - Constraints
 - M&S Risk Management
- Acceptability Criteria
 - Acceptability Issues & Crit
 - Acceptability Criteria Mea
- M&S Description
 - M&S History
 - M&S Development
 - M&S Variables
 - M&S Inputs/Outputs
 - Configuration Manage
- Accreditation Resources
 - Accreditation Funding
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Accreditation Plan

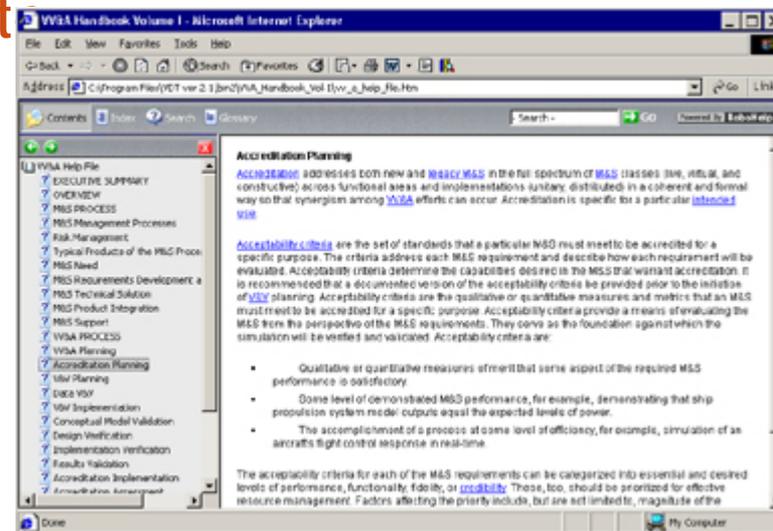
- **DOD: Reduced resources expended on collaboration of geographically dispersed members.**
- **User: Collaborative editing and streamlined process**

Project Explorer



Editor - Purpose

- Document consistently and holistically
 - VV&A-specific framework
- Do more in less time
 - Foundation: DOD VV&A policy
 - References
 - Cut-and-past



Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

Bottom Line: Let's not reinvent the wheel.
Reduce document-delivery time by not starting
with a blank slate.

Taking the Guesswork Out of VV&A

- Publish to Word
 - Print to your local printer quickly & efficiently
 - Polish your published documents to fit your organization's preferences
- Benefits
 - DON: Standardized artifacts for all DON M&S
 - User: Conformity to DON VV&A precepts while preserving the flexibility required to tailor VV&A according to need

1. PURPOSE

Describe the purpose for the accreditation and summarize the need for M&S from the program's point of view, as detailed below. Approach from the M&S program objectives view.

a. System/Process Modeled

Describe the system, process, or phenomenon being modeled. Provide a logical representation of a system, entity, phenomenon or process. Simulations include a method of implementing a model over time.
SECNAVINST 5200.38A, 28 February 2002

The Navy is undertaking the development of a training device for a medium-range Unmanned Aerial Vehicle (UAV) which the Navy has already developed and plans to deploy in one and a half years. The UAV flight testing has been underway for a while and will continue for another eighteen months before the UAV moves into production and deployment. The UAV design requires that the operator have the capability to fly it during take-offs, landings, and some missions. The operator will have the capability to control the speed, attitude, and heading of the UAV. It is intended to carry a variety of sensor packages and the operator may also have to direct the sensor at the area of interest while the UAV moves.

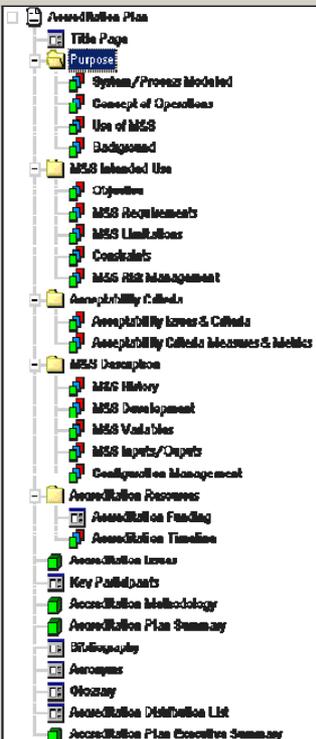
In addition to the actual trainer software, a number of data sets representing cases to be used to train new operators are needed. These cases should cover all phases of UAV operations and span a representative set of operational conditions in terms of missions, terrain, and weather conditions. The development of the trainer is being handled by one of the Navy laboratories with most of the programming work being contracted to a commercial software developer.

All M&S test resources intended to support Operational Test and Evaluation (OT&E) including new and legacy M&S, enhancements and modifications of M&S, hardware-in-the-loop simulator, land-based test facilities, sea-based test facilities, threat target simulators and stimulators, and all M&S whether embedded in weapon systems, implemented as stand-alone systems, or integrated with other M&S systems for distributed simulations.



b. Background

The trainer design team has developed requirements and is writing a Conceptual Model of the software to be used in the trainer. They investigated the possibility of using the simulations used in designing the UAV as the flight performance module of the trainer. The models have been validated by the performance data collected in the UAV flight program to date. However, they do not believe that the models can be made to run in real-time as required by the trainer. Some simplifications will be necessary to achieve real-time operation. Some of the simplifications will be in model structure but some will touch the fundamental aerodynamic calculations performed. The simulation of operator controls can be generated with a commercial software package. The displays presented to the trainee



Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.

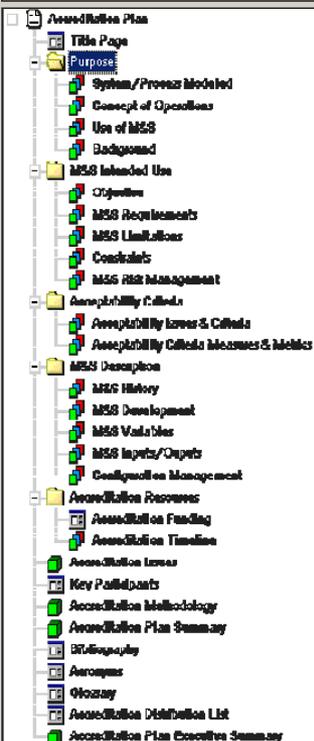
How Does Standardization Help You?

- **Resources not wasted** deciding what information to include and format
- **Increased understanding** of the intended use and thoroughness of technical evidence
- **Completeness** instills **confidence** in reviewers and decision makers
- Supports **future reuse** of information in documents to support the next accreditation



THE BOTTOM LINE – Summary and Recap

Project Explorer



Editor - Purpose

- VV&A documentation standardization benefits everyone
- VV&A Documentation Tool might offer an 80% solution to meet your needs
- Working together we can improve the tool to everyone's satisfaction

Purpose

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Project Explorer

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 - M&S Risk Management
 - Availability Claims
 - Availability Issues & Criteria
 - Availability Claims Measures & Metrics
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Editor - Purpose

)

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Purpose

Describe, in general, why the use of modeling and simulation is needed. Describe the purpose for accreditation. Describe events the model or simulation (M&S) will support.