



**V&A**

# **Verification, Validation & Accreditation Recommended Practices Guide**

**On-Line Version**



## **Presentation to DMSO Industry Days**

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## *The M&S PM and VV&A?*

*The M&S PM supervises the development effort and allocates resources to all phases of development, including VV&A.*

*The PM can use V&V activities to reduce risk in the M&S development.*



## *How Does the M&S PM Impact VV&A?*

- **The PM:**
  - Is concerned about the credibility of the development product
  - Conducts routine risk assessments to identify potential problems
  - Balances resources to ensure all phases of the development are resourced
- **The PM provides:**
  - The necessary emphasis on VV&A activities
  - Resources for VV&A activities
  - Continuing emphasis on VV&A



## ***How Does VV&A Impact the M&S PM?***

- **The PM is directly concerned about the risk inherent in the development program**
- **The PM conducts risk assessments to identify:**
  - **Technical risk**
    - **Representations of highly complex phenomena**
    - **Representations of phenomena not represented in legacy M&S**
  - **Management risk**
    - **Resource shortfalls (time & funding)**
    - **Lack of adequate User involvement**
    - **Unclear requirements**
- **VV&A activities provide the PM a risk reduction mechanism**



# **What are the M&S PM's Responsibilities in VV&A?**



- **The PM manages the development:**
  - Allocates resources to all phases of development
  - Ensures the integration of VV&A and development & test activities
  - Ensures requirements are fully stated & provided the V&V Agent
  - Ensure the V&V Agent is included in test & evaluation planning
  - Ensures that V&V activities occur as part of formal development processes
  - Continually looks at trade-offs
- **The PM allocates resources to VV&A:**
  - Ensures adequate time is provided in the schedule
  - Ensures adequate funding is provided in the budget
  - Considers V&V requirements in tool selection for development



## *What Challenges does the User Face Relative to VV&A?*



- **Balancing resources among numerous valid & competing claimants – development (design, code, integrate, test), V&V, T&E**
- **Integrating V&V with development activities**
- **Incomplete requirements**
- **Incomplete conceptual model**
- **Transitioning from design to code**



## *Specific User Responsibilities*

<b>Activity</b>	<b>Typical User Support</b>
<b>Define the problem</b>	<b>Obtain agreement with the User and Developer</b>
<b>Develop project profile risk assessment; SMEs; Users; check SOW for V&amp;V</b>	<b>Identify requirements &amp; specs; schedule; resources; requirements</b>
<b>Develop V&amp;V schedule</b>	<b>Use risk assessment to focus V&amp;V effort</b>
<b>Tailor V&amp;V tasks correspond to related development activities</b>	<b>Focus on highest risk areas &amp; schedule tasks to</b>
<b>Produce the V&amp;V Plan</b>	<b>Ensure the V&amp;V Plan is developed &amp; reviewed by the User, Developer, and Accreditation Agent</b>



## ***Specific User Responsibilities (cont.)***

<b>Activity</b>	<b>Typical User Support</b>
<b>Define requirements requirements for the project</b>	<b>Ensure the Users provide specific and achievable</b> <ul style="list-style-type: none"><li>- <b>Measurable</b></li><li>- <b>Traceable to simulation development objective(s)</b></li></ul>
<b>Define acceptability Criteria</b>	<b>Develop criteria for all requirements; ensure they are validated</b>
<b>Develop conceptual model</b>	<b>Ensure the conceptual model is developed &amp; validated; Plan use of SMEs</b>
<b>Design &amp; implementation</b>	<b>Ensure designs &amp; code are verified; data &amp; algorithms validated (risk management)</b>
<b>Coordinate V&amp;V with T&amp;E</b>	<b>Share verification resources during DT &amp; OT</b>