

ACCREDITATION AUTHORITIES

A composite image of Earth, the Moon, and Mars in space. The Earth is in the foreground, showing blue oceans and brown continents. The Moon is in the middle ground, and Mars is in the background. A bright sun is in the upper right corner, creating a lens flare effect. A red double-headed arrow points from the sun towards the Earth and Moon.

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CONSTELLATION

Accreditation is:

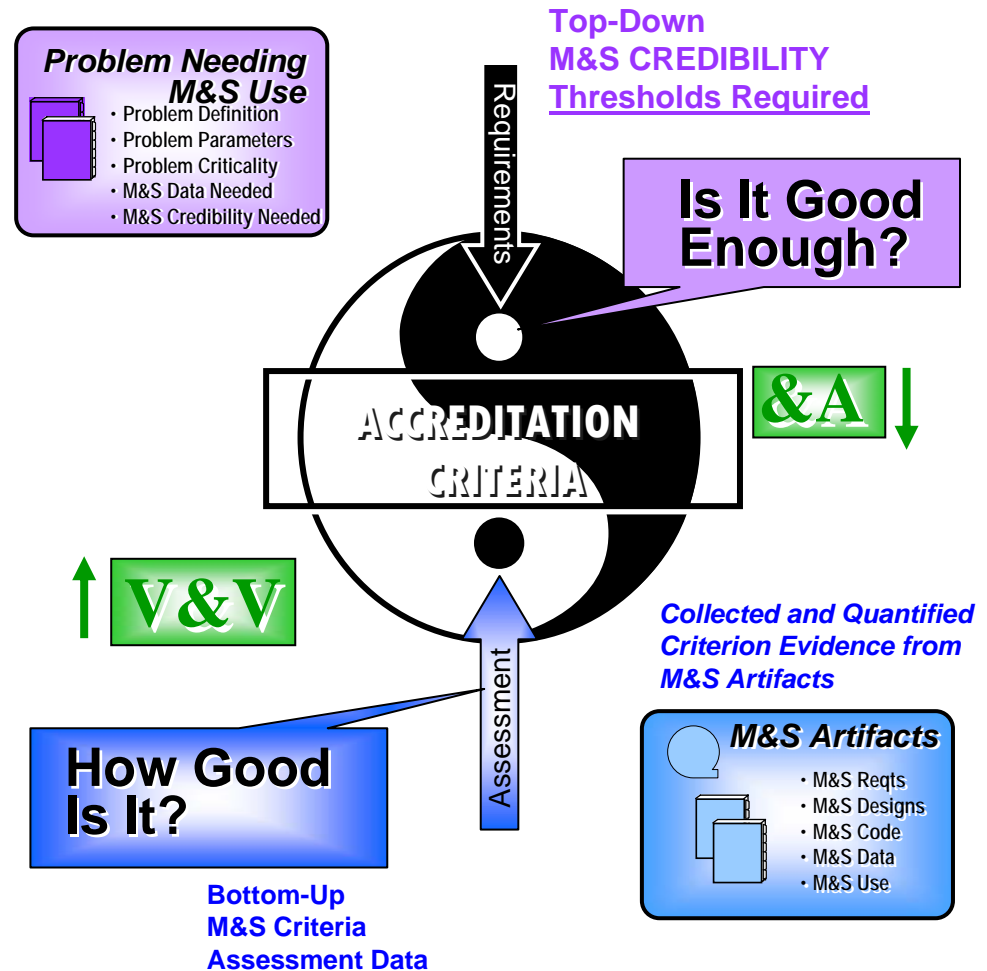
The official endorsement that a model or simulation or federation of models and simulations and its associated data is acceptable for use for a specific purpose.

The provider is:

Responsible for releasing, certifying, assessing, verifying, validating, the model or simulation and/or quantifying the uncertainty of the data given.

The decision maker is:

Responsible for approving or accrediting the simulation that is used. Or more simply put, just believing the data provided.



Accreditation Is The End User's Determination An M&S Is Acceptable For Use



What is M&S Accreditation?



Accreditation is:

The formal approval for use for a specific purpose of an M&S, given that:

- The M&S and its associated data have been objectively and quantitatively evaluated by a cognizant experts and
- Evidence exists supporting the ability of the M&S to produce real-world-representative data within the operational ranges of, and within the accuracy required by, the specific purpose.

There is an implication that someone or some group has the authority to approve use of model or simulation. That entity is the “Accreditation Authority”

Accreditation Is The End User’s Determination An M&S Is Acceptable For Use



Definitions of VV&A Roles & Responsibilities

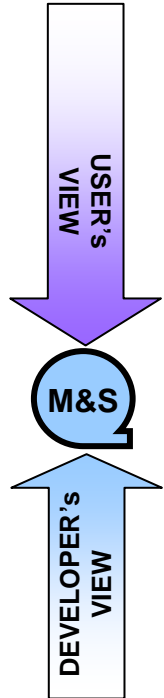


VV&A Roles

Role Descriptions

M&S Results Users		Accreditation Authority	A management agent or board responsible for specifying the acceptance criteria and has authority to accredit an M&S application for intended use in accordance to prescribed acceptance criteria.
		Subject Matter Expert (SME)	A recognized NASA leading practitioner in a given field of study and or discipline appropriately related to the intended use of the M&S, will provide peer review.
M&S Users		Accreditation Agent	The individual, group, or organization that will define accreditation plan and conduct of accreditation assessment based on V&V of M&S application to ensure evidence of credibility is compliant with specified accreditation criteria.
		User / Analyst	The individual, group, or organization that will define the requirements for, select and execute the M&S, and use the data generated from the M&S, to conduct specific analysis. User will provide assistance with specification of acceptability criteria.
M&S Builders		Developer	The individual, group, or organization responsible for developing the model and or simulation. The developer will conduct V&V activities to comply with specified accreditation and V&V plans.
		V&V Agent	The individual, group, or organization will define, plan and conduct verification and validation activities to generated and document the evidence of M&S credibility in compliance with acceptability criteria.
VV&A Services		VV&A Broker	An assigned VV&A professional practitioner responsible for the coordination and oversight of prescribed accreditation process and VV&A activities for each of the CxP M&S Accreditation Candidates.
		VV&A Lead	Responsible for management oversight of VV&A efforts and acting initiator of accreditation process for all designated M&S Accreditation Candidates. The lead assigns brokers to M&S Accreditation Candidate, monitor and report status of all VV&A activities.

How Good Does it Need to Be?



How Good Is it?



M&S VV&A Accreditation Authority



Accreditation
Authority

Organizational Authority

- Reports to program/project management
- Must have the authority to prescribe & approve specific M&S use
- Must have the authority to commit resources for specific M&S VV&A

Qualifications

- Must have the technical cognizance to assess the proper use of specific M&S applications
- Must be able to weigh cost, schedule, and risk against alternatives

M&S VV&A Responsibilities

- Specifies (and documents) the programmatic priorities for specific M&S use
 - based upon technical need, schedule, and any associated risk factors
- Approves resource expenditures and schedules for specific M&S VV&A
- Specifies (and documents) the technical requirements for specific M&S use
 - specifies the specific minimum levels reqd for each VV&A accreditation criterion
- Reviews and Approves Accreditation Plans for specific M&S use
- Makes Go/No-Go decisions for each of Three VV&A Phases
- Makes accreditation decision based upon results of VV&A assessment results, and other inputs
 - Approves and signs accreditation memos and memorandum of records for M&S
- Reports to project management on any special conditions of specific M&S use
 - caveats, limitations, assumptions, constraints of specific M&S



Accreditation Authority Examples



◆ Meteorite Engineering Model (MEM) Example

- Environmental M&S
- Wide Applicability
- Authority is a uniquely qualified and recognized SME

◆ SpaceNet Example

- Industry/Academic Developer
- Multiple discipline SME panel
- Authority is analysis lead

◆ Campaign Manifest Analysis Tool

- NASA Developer
- Special purpose application
- Authority is sponsor

◆ Fully Unstructured Navier-stokes 3-dimensional (FUN3D)

- Aero CDF Code
- Development community distinct from Users Groups
- Authority receiving panel / supplying panel?

◆ Ares Critical Math Model (CMM) process

- NASA and contractor developers
- Accreditation Authority is MSFC Chief Engineer



Define Accreditation Criteria

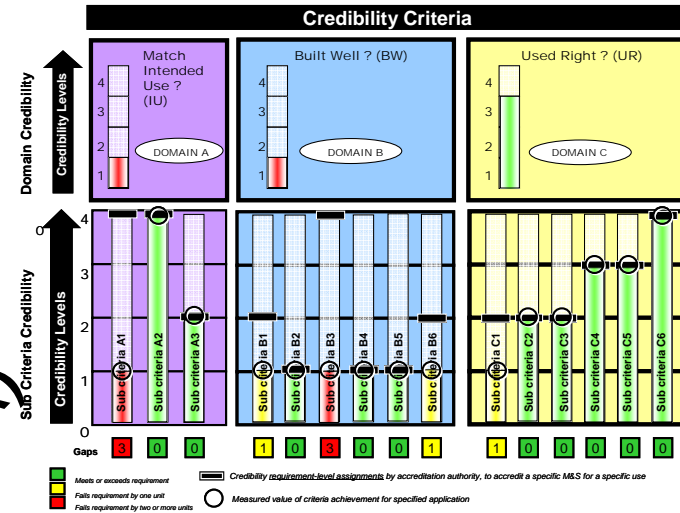
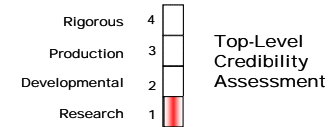
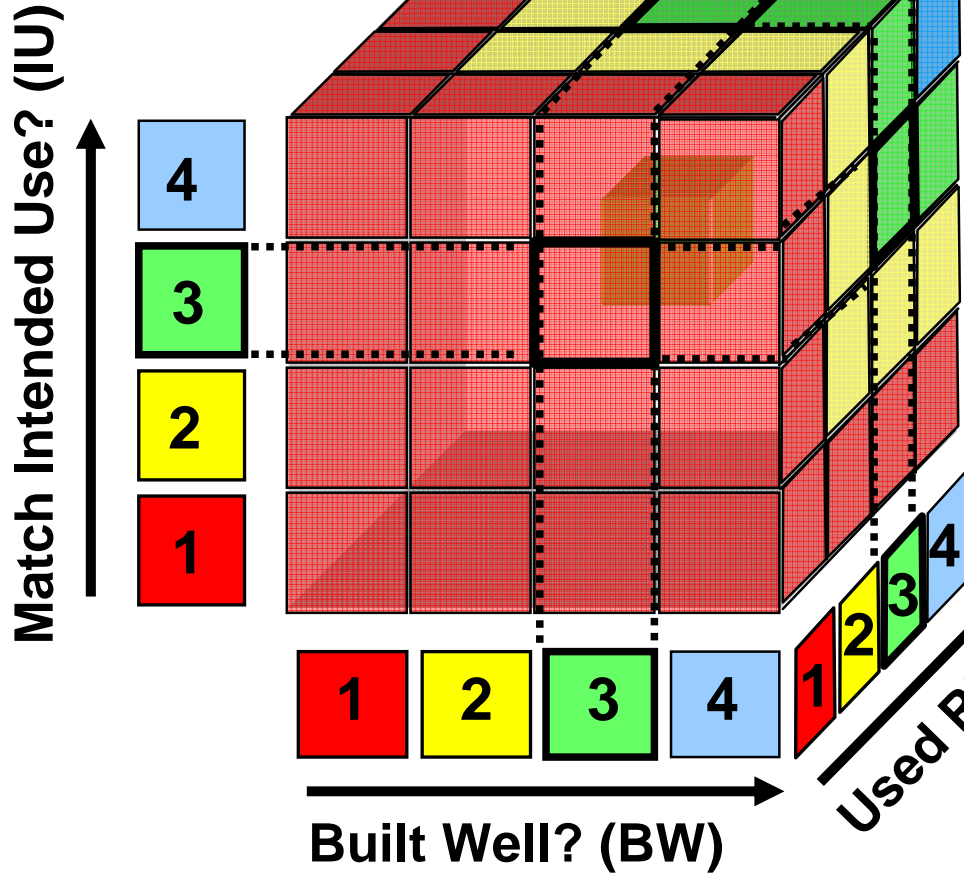


- ◆ **Related to credibility but not necessarily synonymous**
 - Includes programmatic considerations – like use cost
 - Addresses suitability
 - Considers actual conditions of use

- ◆ **Based on DoD, DoE and Industry standards**

- ◆ **Selected from the an encyclopedic list based on the objectives of the Accreditation Authority and the circumstances of the simulation effort**

Multi-Dimensional M&S Credibility Space

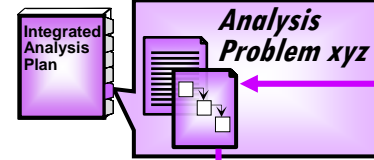


72 Lower Level Accreditation Criteria

Fundamental Touch Points for M&S Accreditation vs. M&S Results-Credibility



"The Needs" for M&S Application



Analysis xyz Results

[Known M&S Results-Credibility]

Are the M&S "needs" for Analysis xyz defined?

Analysis xyz input data needs defined?

Analysis xyz data flow defined?

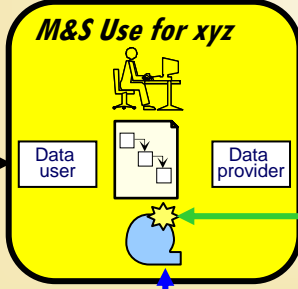
Analysis xyz output data needs defined?

Analysis xyz needed-results defined?

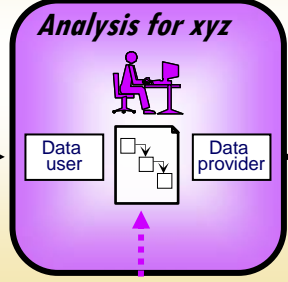
Credibility Assessment [AFTER USE]

- BUILT WELL
- FIT TO PURPOSE and
- USED RIGHT

Use M&S to Generate Needed Analysis Data



Conduct Analysis and do Pre and Post Data-Processing



Produce Analysis xyz Report

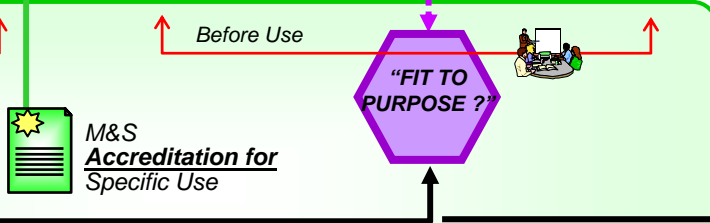
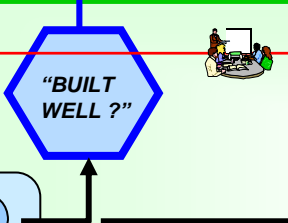


M&S Results Credibility



M&S is Built Well

M&S is Fit for Intended Use



M&S Accreditation for Specific Use

VV&A [BEFORE USE]

