



2d Space Launch Squadron
**Slowing Down to Speed Up: Risk-Minded
Innovation**

"LAUNCH AND TEST ABOVE THE REST"

Mission

- Evaluate, integrate, operate and assure current and emerging air and space launch, landing and test missions

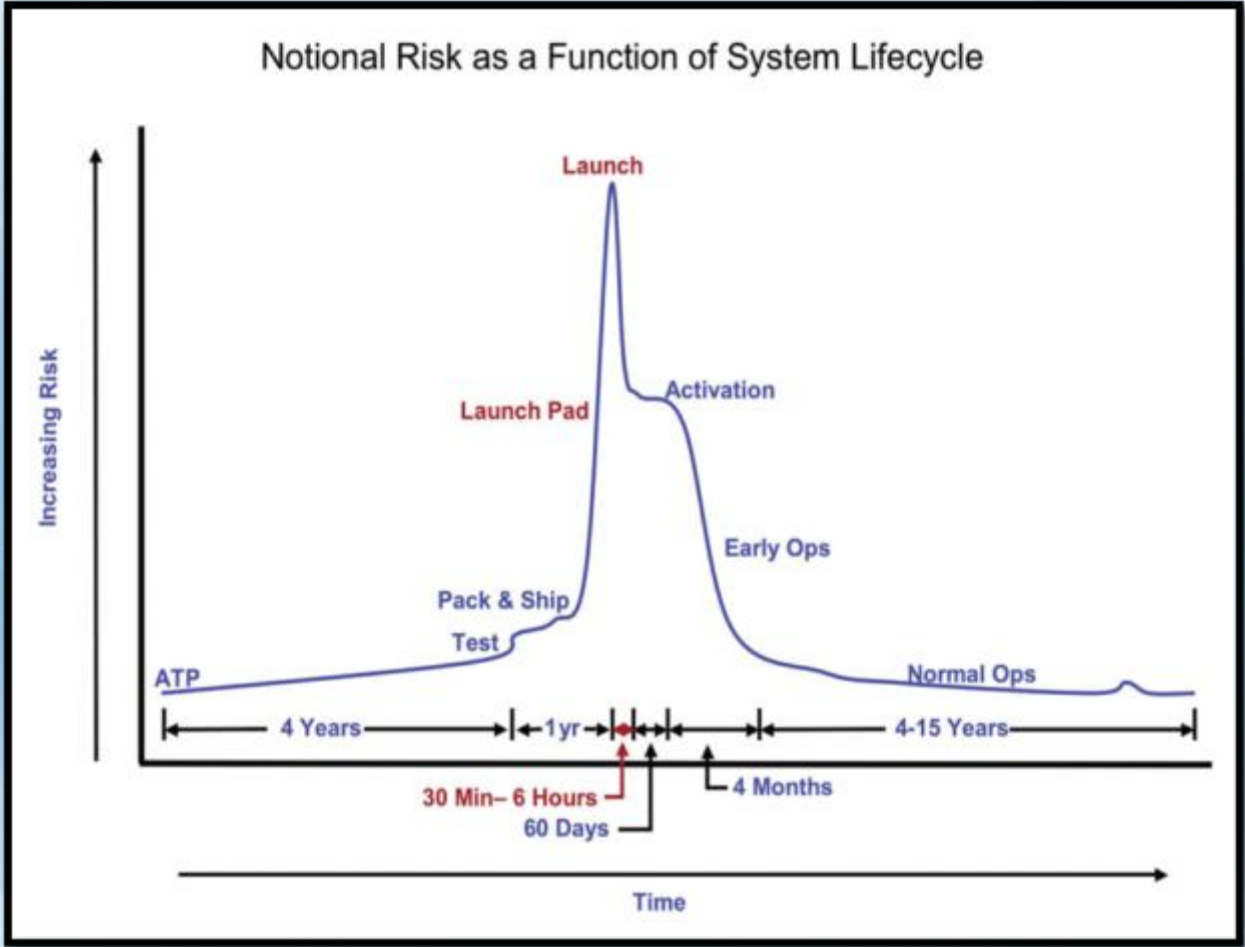
Vision

- Innovate and advance critical air and space and landing capabilities for the Nation





Mission Assurance



In Space Mission Assurance there is no second chance for success!

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Starlink 9-3 Mission

- 20 Starlink Satellites lost
- 1.5 years spent
- \$15M wasted
- Actual Lifetime: 0 days



SDA-T1TL-B Mission

- Critical lift anomaly caught by MAT
- Rapid response ensured success
- 21 satellites in orbit



Organizational Interfaces

Aerospace Responsible Engineers (AREs)

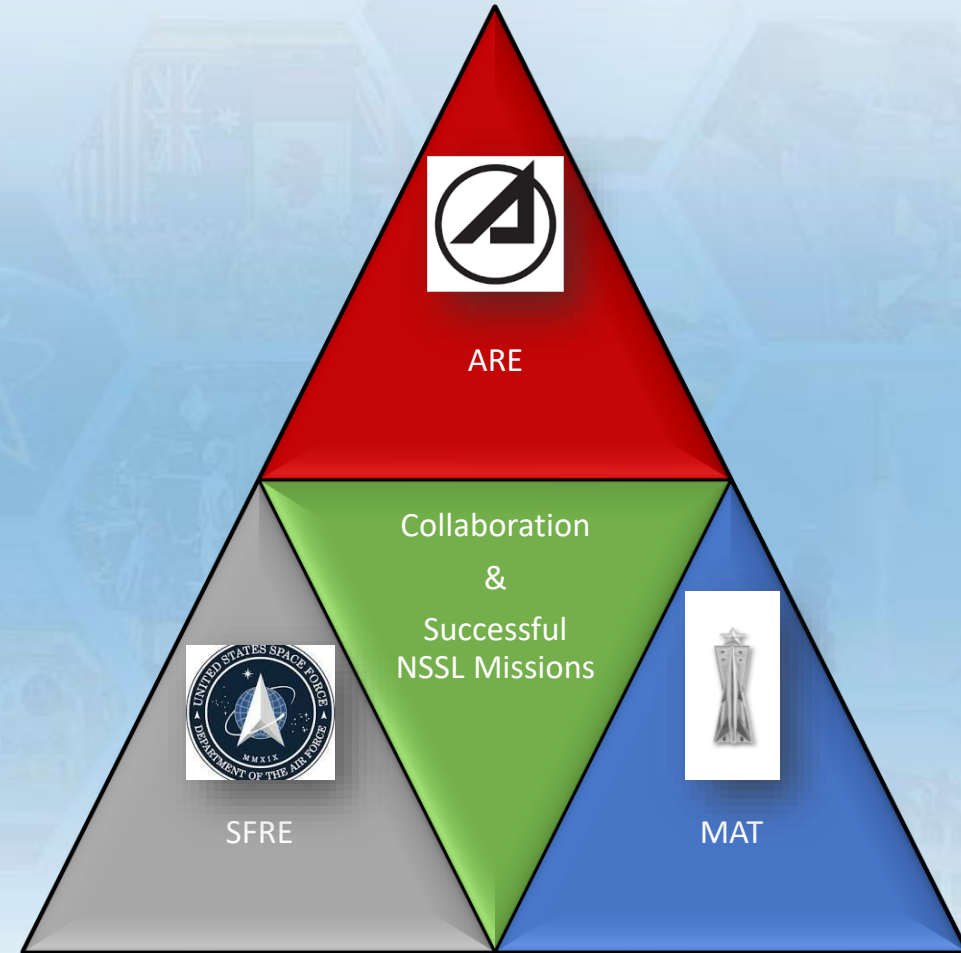
- Continuity for SFRE knowledge
- Corporate/engineering background

Space Force Responsible Engineers (SFREs)

- Provide technical risk assessments
- MAT inputs considered for decisions

Mission Assurance Technicians (MATs)

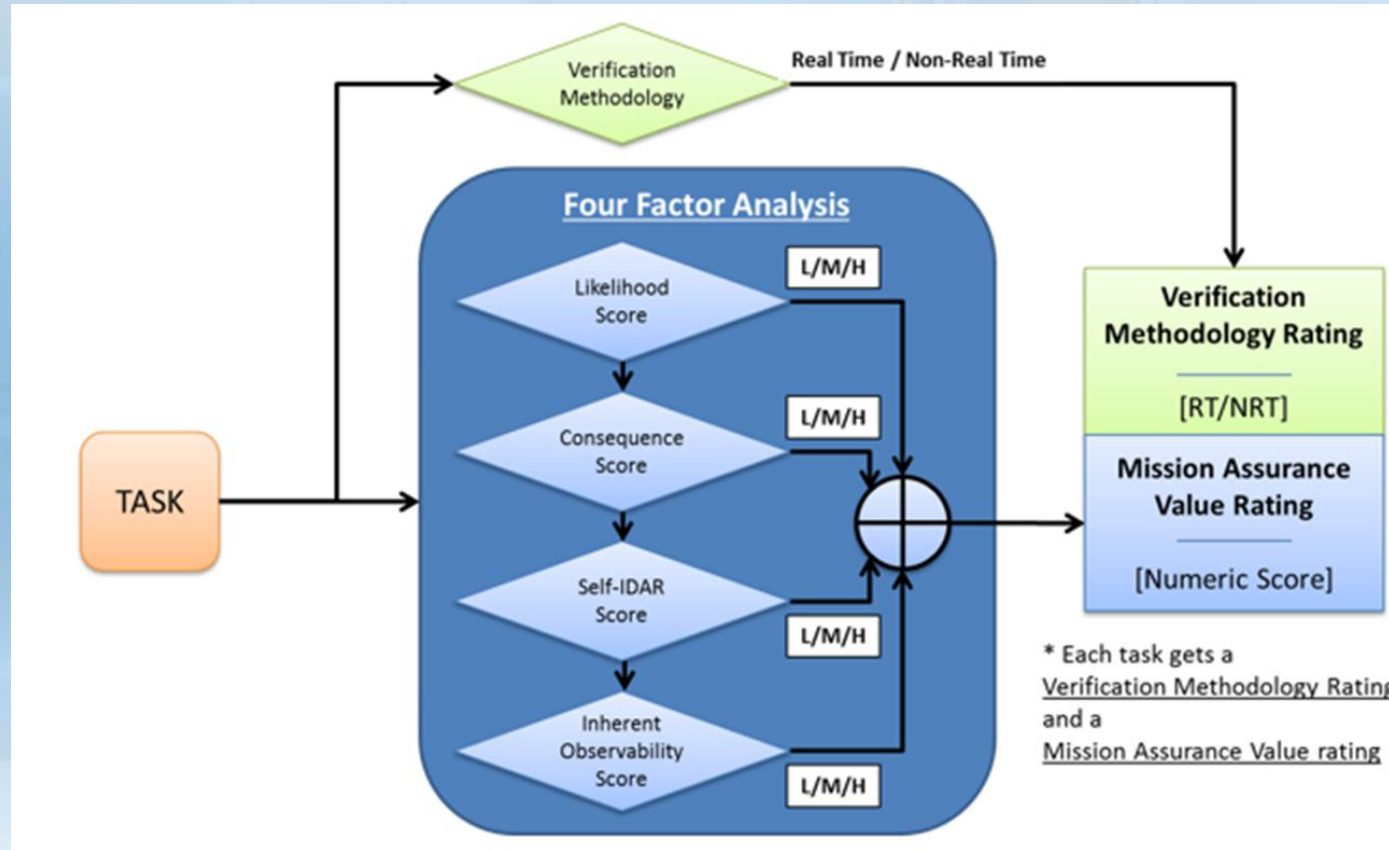
- Missile and space systems knowledge
- The eyes and ears at the LSP facilities
- Raised in “Culture of Compliance”





Previous Approach

- Risk-Based Mission Assurance & Four Factor Model



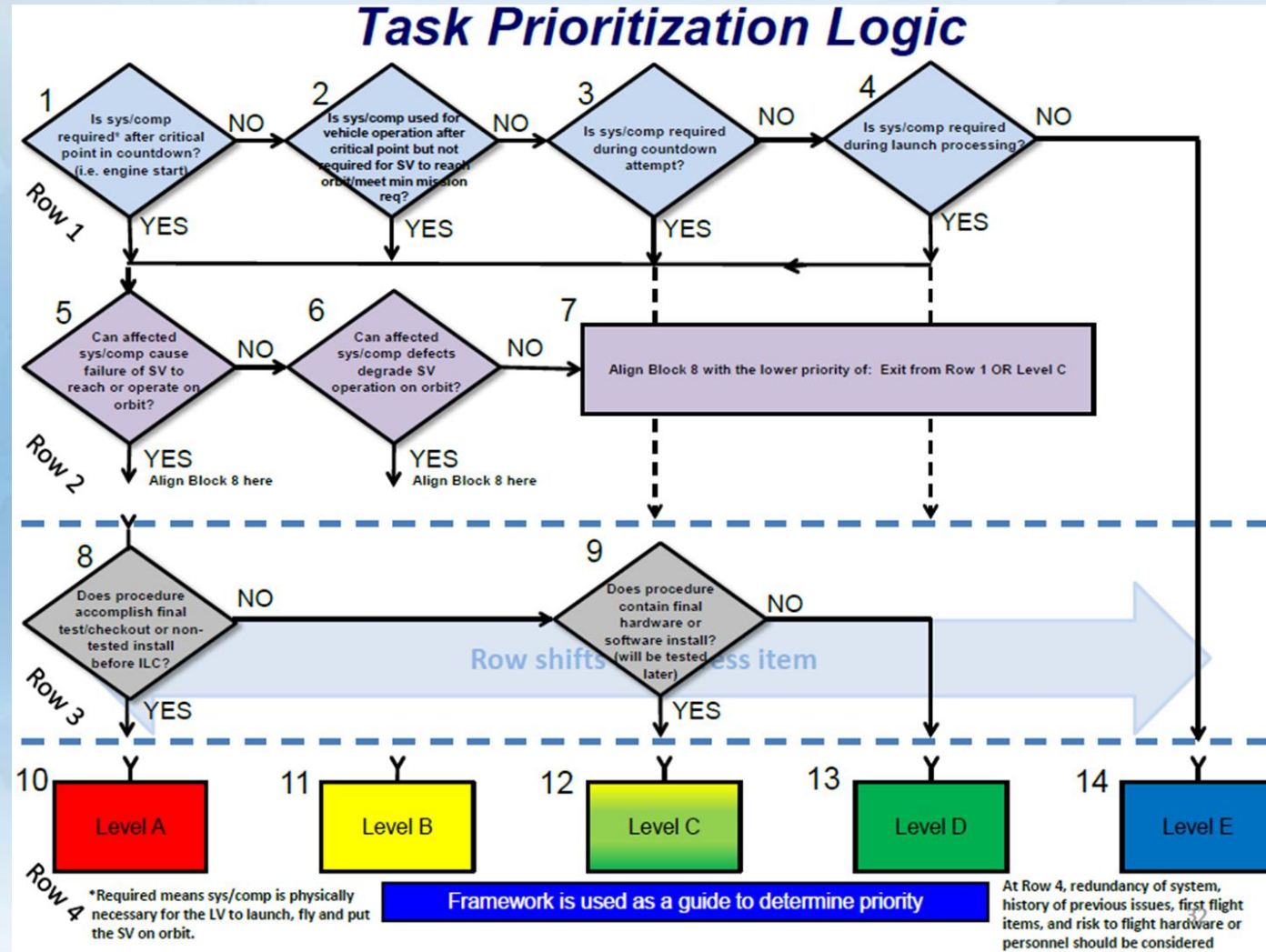


Likelihood Factor – RBMA Process

Score	Criteria
LOW	<ul style="list-style-type: none">- LSP has a significant historical record of accomplishing the procedure successfully- Procedure involves hardware that has flown several times without incident in the current configuration- Procedure entails a relatively low degree of complexity- Personnel involved in the procedure have a high degree of training or experience
MEDIUM	<ul style="list-style-type: none">- LSP has some historical record of accomplishing the procedure successfully- Procedure involves hardware that has been flown at least once without incident- Procedure involves hardware with minor configuration modifications since last successful flight- Procedure entails a relatively moderate degree of complexity- Personnel involved in the procedure have a moderate degree of training or experience
HIGH	<ul style="list-style-type: none">- LSP does not have a historical record of accomplishing the procedure successfully (either the procedure has failed in the past or it has never been accomplished)- Procedure involves hardware that either has not been flown in the past, has had past failures or has been significantly modified from previous hardware configurations- Procedure entails a relatively high degree of complexity- Personnel involved in the procedure have a low degree of training or experience



RBMA Process



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New Method – MIP Process

What is the worst-case impact to mission success if a defect is missed or introduced during task execution? What is the likelihood of realizing this mission impact?

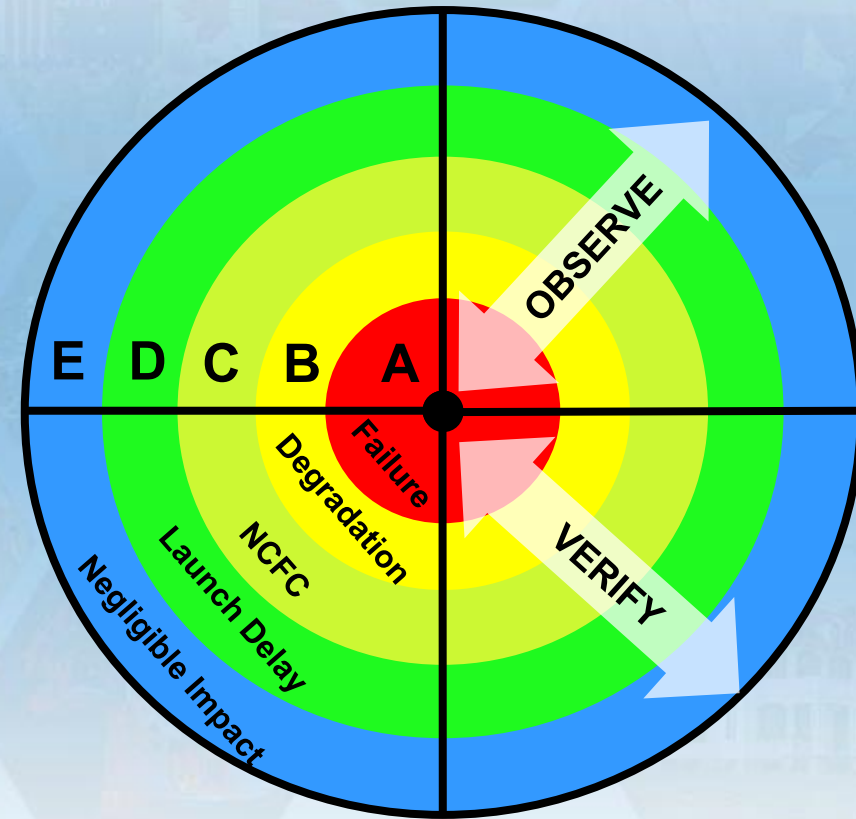
1. Mission Impact levels:

- Level A: Mission failure
- Level B: Mission degradation
- Level C: Non-Critical Flight or Countdown issue (NCFC)
- Level D: Launch delay
- Level E: Negligible impact. Minimal/no MA risk increase if not verified

2. Coverage Methods

- Real-time observation
- Verification after the task

Mission Impact:
“Bullseye”



Bullseye visualizes two elements:

1) Mission Impact

2) Coverage Method

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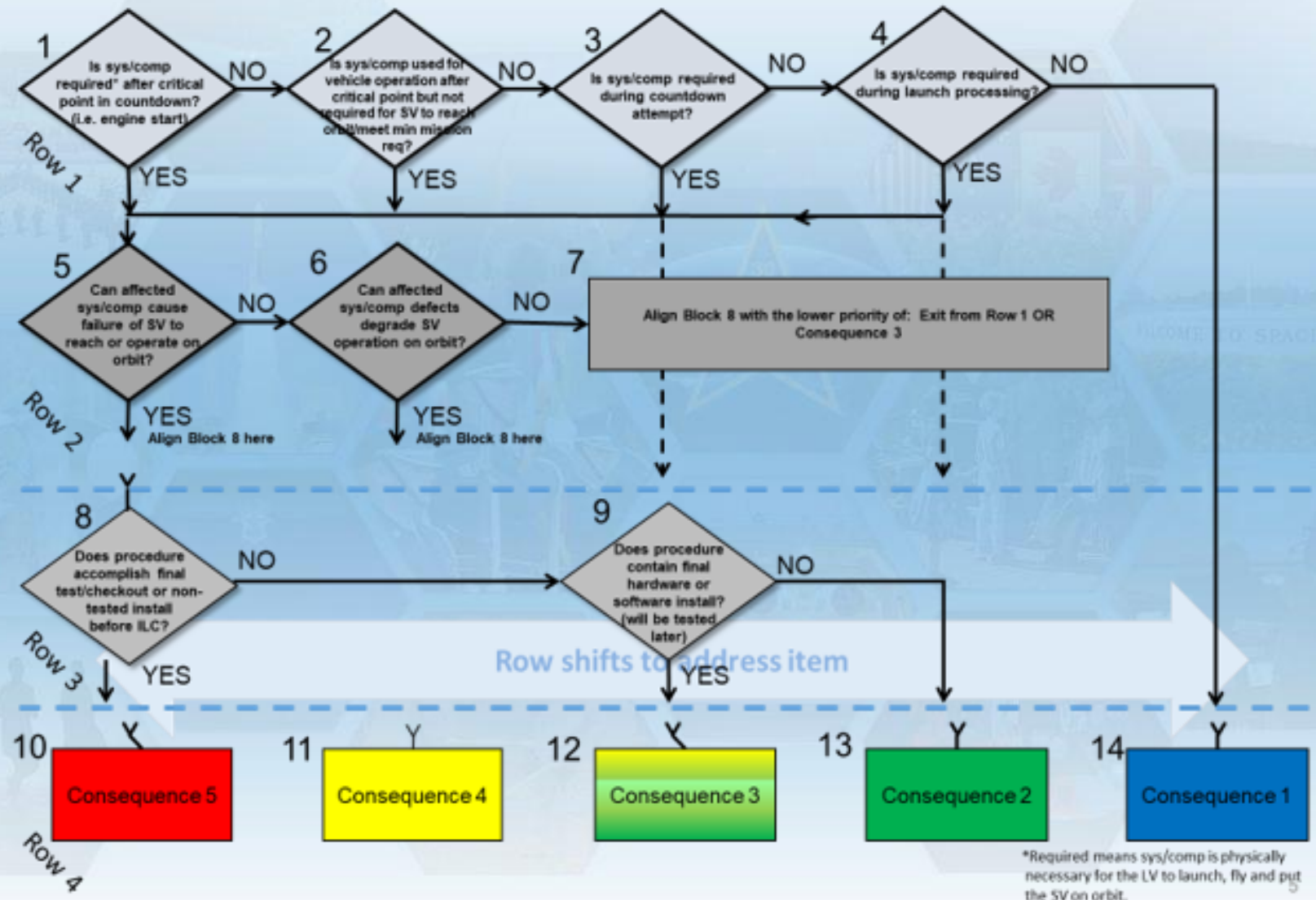


MIP Step by Step Process

- 1. Review the LSP or Spacecraft Contractor procedure. As part of the normal technical review process:**
 - Assess a worst-case impact to mission success if a defect is missed or introduced during procedure execution
 - Determine appropriate task coverage method based on the nature of the operations
- 2. Use MIP Task Consequence Logic Flowchart to obtain consequence rating**
- 3. Use MIP Qualitative Assessment Matrix to obtain likelihood rating**
- 4. Enter MIP Priority Identification matrix with consequence and likelihood ratings to determine task priority**
- 5. Document path through flow chart and the qualitative assessment, preferably right in LVDB. Also document rationale for task coverage method**



MIP Task Consequence Logic



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Consideration	1	2	3
Self Identify	Procedure has a robust internal mechanism for detecting deviations, multiple reviewers, or significant oversight	Procedure has a moderate internal mechanism for detecting deviations, single additional reviewer, or limited oversight	Procedure lacks internal mechanism for detecting deviations, no reviewers, or no oversight
Detectability	Activity/system defect easily screenable - highly likely to become known	Activity/system defect moderately screenable - likely to become known	Activity/system defect difficult to screen - unlikely to become known
Operational Experience	Significant experience with procedure and/or correlation with previously flown item (recommend 7+)	Limited experience with procedure and/or correlation with previously flown item (recommended 3+)	First flight procedure involved; Significant procedure changes (steps, sequence, GSE, processes, etc.)
Procedure Complexity	Low: Does not require specialized tooling, GSE, or training/certifications. Does not require coordination between techs.	Moderate: Requires some specialized tooling, GSE, or training/certifications. Requires moderate level of coordination between techs	High: Requires highly specialized tooling, GSE, or training/certifications. Requires high level of coordination between techs
Design/Procedure Robustness	Procedure involves components designed in a manner that minimizes the potential for them to be installed, handled, configured or tested incorrectly	Procedure involves components designed in a manner that generally cannot be installed, handled, configured or tested incorrectly	Procedure involves components designed in a manner that could be installed, handled, configured or tested incorrectly
Procedure Maturity	High: No history of issues or redlines	Moderate: Some history of issues or redlines - root cause addressed	Low: History of issues or redlines - root cause not addressed

Likelihood Output												
State	L1	L2		L3		L4			L5			
Self Identify	1	1,2	1	1	1,2	1,2	1,2	2,3	2,3	-	-	3
Detectability	1	1,2	1	1	1,2	1,2	1,2	2,3	2,3	-	-	3
Operational Experience	1	1	1	1,2	1	1	2	1	2	3	-	-
Procedure Complexity	1	1	2	1	1,2	1,2	1,2	2,3	2,3	-	-	-
Design/Procedure Robustness	1	1	1	1	1,2	-	-	1	-	-	-	2,3
Procedure Maturity	1	1	1	1,2	1	2	-	1	-	-	3	-

↑
All are true
"LAUNCH AND TEST ABOVE THE REST"

↑ OR ↑ OR ↑

"-" ≡ Not Relevant

- If multiple columns have all the conditions met always use the left most column
- If assessment does not fit any column, then there is a need to reevaluate the scoring/(use engineering judgement)
- Do not double book any risk in multiple rows

