



# Using a Novel Evaluation Risk Assessment Process to Prevent the Failure Modes in Reliability Test and Evaluation Programs

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**Mr. Robert N. Tamburello**

Division Chief

Center for Reliability Growth

US Army Evaluation Center



# Concept

- ❑ For system reliability evaluations, we are concerned with identifying the failure modes associated with the system's design.
- ❑ Similarly, during the planning of reliability test programs (RTPs), we are interested in identifying potential "failure modes" in the RTP design in order to mitigate evaluation risk.
- ❑ We adapt the traditional Failure Mode and Effects Analysis (FMEA) process as a tool to conduct evaluation risk assessments for RTP plans.

# Reliability Test Program (RTP) Evaluation Risk Assessment Process Steps

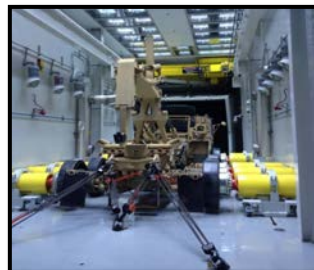
- a. Define the RTP
- b. Identify potential weaknesses in the RTP with respect to evaluation adequacy
- c. Identify monitoring/detection methods and contingency plans
- d. Develop RTP planning alternatives that mitigate, in whole or in part, the potential weaknesses identified in step b

# RTP Evaluation Risk Assessment Process Steps (Cont.)

- e. State the perceived impact associated with the implementation of planning alternatives developed in step d
- f. Document the analysis and summarize the problems which could not be corrected by changing the RTP design and identify the special controls which are necessary to reduce failure risk
- g. Provide a recommendation to decision makers based on the results from steps a through f of the RTP evaluation risk assessment process

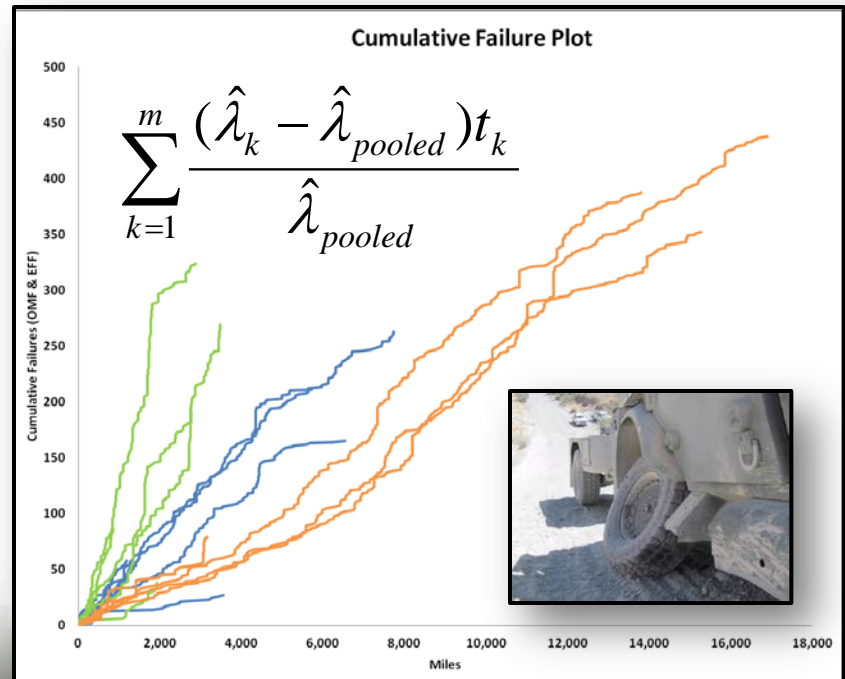
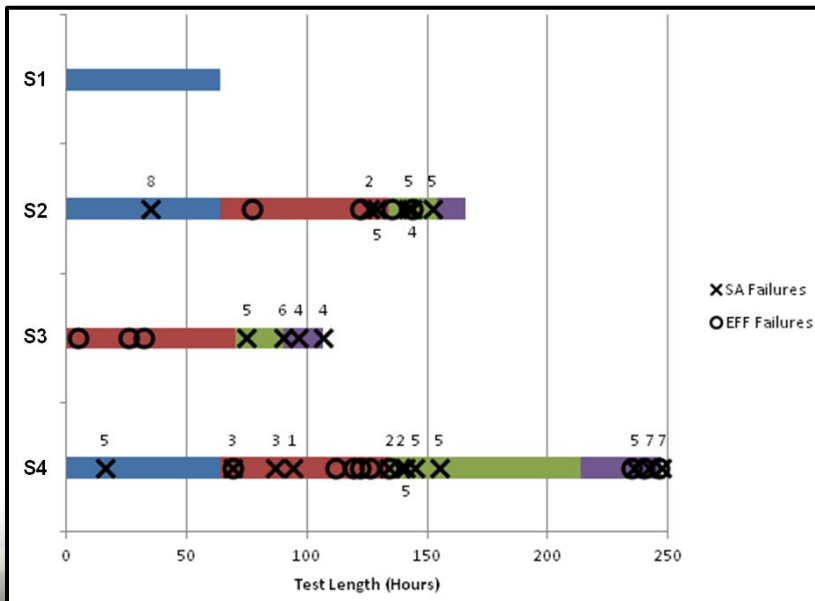
# Reliability Evaluation Risk Indicators (1/3)

1. Potential to surface unreliability drivers
2. Potential to observe impact of system reliability on mission accomplishment
3. Potential to document impact of system reliability on user experience



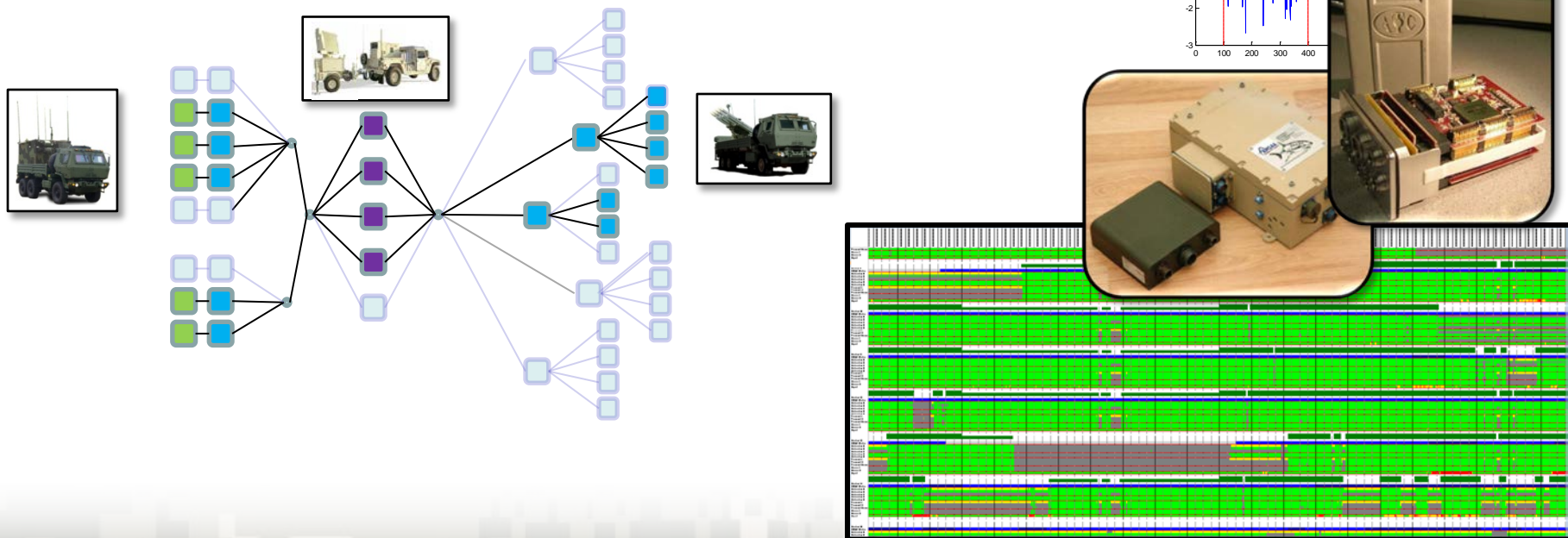
# Reliability Evaluation Risk Indicators (2/3)

4. Likelihood of detecting a 25% system-to-system variation in reliability
5. Likelihood of detecting a 25% drop in reliability between development and operational test environments



# Reliability Evaluation Risk Indicators (3/3)

- 6. Planned proportion of the fielding configuration to be tested during the IOT
- 7. Planned data sources



# Concluding Remarks

- ❑ It is critical to identify, assess, document, and communicate potential evaluation risks associated with a given reliability test program plan.
- ❑ By identifying potential evaluation risks, it is possible to develop and implement detection/monitoring protocols.
- ❑ As well, it is prudent to formulate viable contingency options to enable damage control if risks are realized.
- ❑ Historical information on similar systems or earlier releases can help practitioners establish a starting point.

***Assess Evaluation Risks Early and Often***



# Contact Information

Mr. Robert N. Tamburello  
robert.n.tamburello.civ@mail.mil  
(410) 306-1980

United States Army Evaluation Center  
2202 Aberdeen Boulevard  
ATTN: 2nd Floor, ISMED  
Aberdeen Proving Ground, Maryland 21005-5001