Mission Sustainment Through Environment, Safety, and Occupational Health (ESOH) Risk Management

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Trish Huheey
Office of the Deputy Under Secretary of Defense
(Installations & Environment)

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Increased DoD Emphasis on ESOH

- Total Life-Cycle Systems Management (TLCSM)
  - PM is the designated life-cycle manager
  - Conduct trade analyses early to achieve savings and ensure ESOH compliance throughout the life-cycle, especially regarding impacts to mission sustainment and installations
- Systems Engineering (SE) and Performance Based Logistics (PBL) strategies
  - Increased reliability and reduced logistics footprint
  - ESOH risk reduction and effective integration into systems engineering process
- AT&L Memorandum on *Policy for Systems Engineering in DoD*, 20 February 2004 – Systems Engineering Plan
  - Mandates robust SE approach that balances total system performance and total ownership costs

Why Integrate ESOH in Systems Acquisition?

- ESOH regulations potentially impact sustainability of operations, maintenance, and natural infrastructure
- ESOH compliance issues can impact capability to achieve system missions and exacerbate encroachment problems
- DoDD and DoDI 5000.2 policies
  - Program Mangers required to identify, eliminate when possible, and minimize ESOH hazards and associated risks
  - ESOH considerations are integral part of defense system's operational effectiveness and sustainability
  - SE is one of the primary processes for addressing ESOH with regard to system design, test, deployment, operation, training, maintenance, and disposal, as well as to help maximize resources and reduce total life-cycle costs.

ESOH Risk Management Is Not Optional

- ESOH risk management includes:
  - Hazardous materials and waste
  - Environmental and occupational noise
  - Personnel safety and occupational health
  - Natural environmental assets and infrastructure
  - Compliance with numerous regulations
  - System safety and explosive safety
- ESOH risk management must be ingrained in the program's entire risk identification and acceptance process
  - Using a risk management approach for ESOH compliance does not allow programs to accept risks of non-compliance with ESOH regulations; it does highlight the impacts and allow for informed decision-making

ESOH Risk Management Is Not Optional (Cont.)

- Lack of attention or failure to address ESOH requirements and risks early in the system acquisition process could impact program cost, schedule, performance, and result in
  - Loss of life and/or serious injury to personnel
  - Serious damage to facilities and/or equipment
  - Serious adverse impact on mission capabilities and operability from failures
  - Negative public opinion
  - Potential lawsuits or injunctions from citizens and public interest groups
  - Detrimental harm to the environment and surrounding community

Key Initiatives to Enhance ESOH Integration

- Revise DAU curricula to improve ESOH content
  - DAU System Safety in Systems Engineering Continuous Learning Module (April 2005)
  - Acquisition Core, System Engineering, Logistics, Test and Evaluation, and Program Management functional areas
- Establishment of ESOH risk management criteria in the acquisition process
- Incorporation of ESOH considerations in the Systems Engineering Plan (SEP)

ESOH Risk Management With System Safety

- System safety is the SE approach for eliminating or minimizing ESOH hazards and risks across the system's life- cycle
- AT&L Memorandum on *Defense Acquisition System Safety*, 23 September 2004
  - Integration of system safety into SE mandated
  - MIL-STD-882D, *DoD Standard Practice for System Safety*, used for ESOH risk identification and management
- Defense Safety Oversight Council (DSOC), July 2003
  - Acquisition and Technology Programs Task Force, April 2004
  - Investigate and recommend investments to ensure safety is addressed throughout an acquisition program's life-cycle

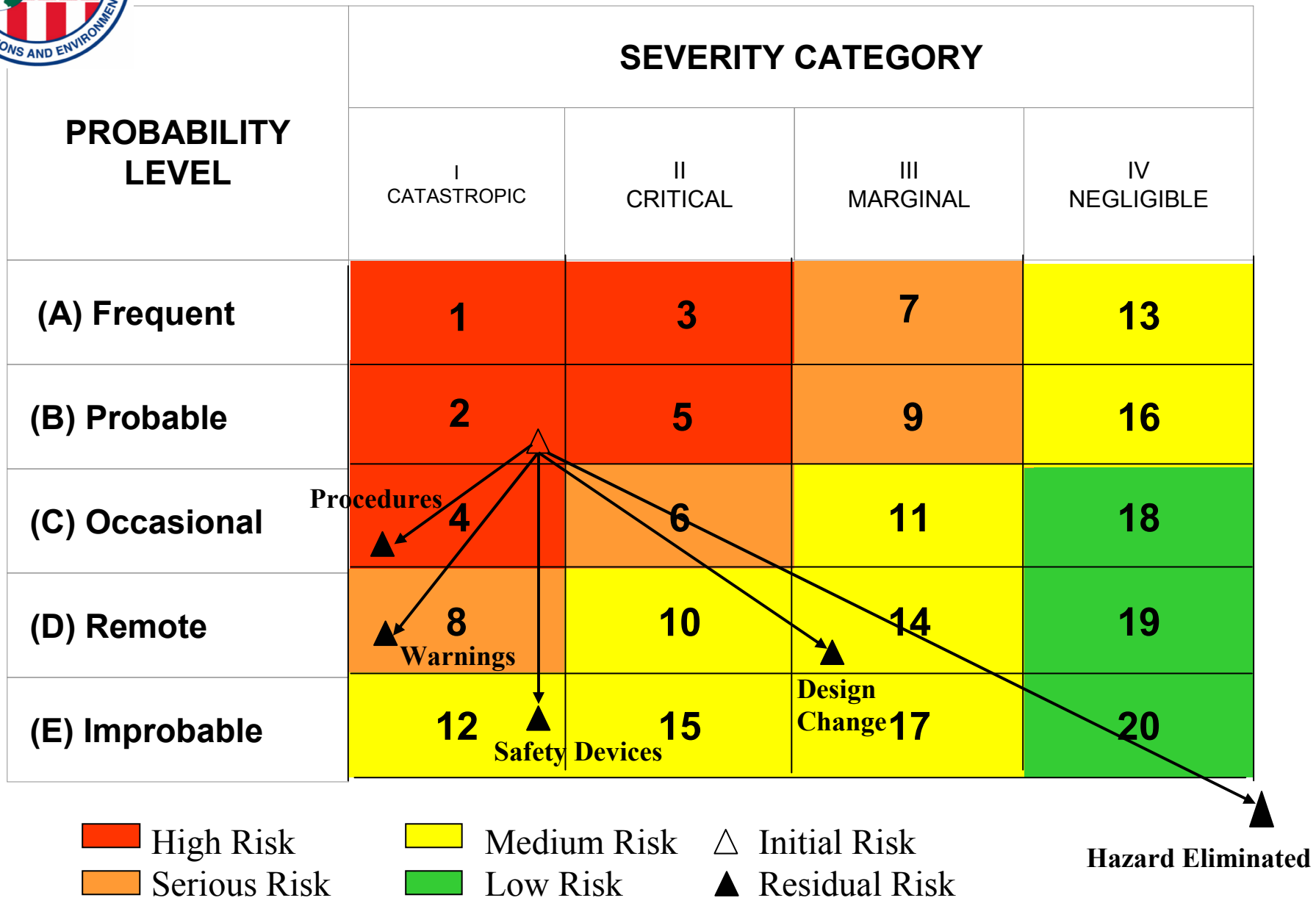
System Safety Order of Precedence

Listed in order from most to least preferred

1. Eliminate hazards through design selection
2. Incorporate safety devices
3. Provide warning devices
4. Develop procedures and training

1. If unable to eliminate an identified hazard, reduce the associated risk to an acceptable level through design selection.
2. If unable to eliminate an identified hazard through design selection, reduce the risk to an acceptable level using protective safety features or devices.
3. If safety devices do not adequately lower the risk of the hazard, include a detection and warning system to alert personnel to a particular hazard.
4. Where it is impractical to eliminate hazards through design selection or to reduce the associated risk to an acceptable level with safety and warning devices, incorporate special procedures and training. Procedures may include to use of protective equipment.

Risk Mitigation Measures (RMM) Example



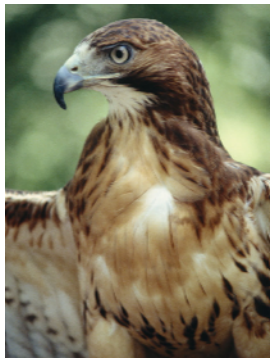
Conclusions

- Effective ESOH integration into the acquisition SE process is essential to sustainability and operational effectiveness
  - Regulatory and public interest concerns can impede ability to develop, test, operate, maintain, train, and dispose of systems
  - Effective life-cycle ESOH risk management during system design and development maximizes potential for cost and liability reduction
- The PM must look forward over the entire life-cycle of the system and make the case to Resource Sponsors for early investments for future cost avoidance
- Resource sponsors must recognize that investing in designs and materials that reduce the burden on the natural infrastructure result in lower life-cycle costs and unencumbered, sustainable operations
  - Further supports the mandatory use of TLCSM

Questions and Answers

Ms. Trish Huheey
ODUSD(I&E)
3400 Defense Pentagon
Washington, DC 20301-3400

703-604-1846 DSN225
Patricia.huheey@osd.mil



Acquisition ESOH Guidance References

Acquisition Community Connection, ESOH Special Interest Area (http://acc.dau.mil)

AT&L Knowledge Sharing System (AKSS) (http://deskbook.dau.mil)