



Energetic Obsolescence Mitigations

11th CAD/PAD Technical Exchange
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Log-Line

A variety of ingredients and propellants have been implicated as potential supply risks over the last three years. The Cartridge Actuated Devices / Propellant Actuated Devices (CAD/PAD) Propellant Obsolescence Team has been documenting and quantifying these risks.

Outline

- What makes a risk?
- How do we classify our energetic risks?
- What strategies can be used for dealing with energetic obsolescence?
- How can government and industry help each other?

Obsolescence Risks



- Material unavailability
 - Supplier(s) goes out of business or decides to stop making material
 - Stockpiles of a material are depleted/deteriorated
 - Raw ingredients become unavailable
- Regulatory
 - Materials are an environmental or health hazard
 - Processes are no longer allowed
- Technical knowledge base depleted
- Overwhelming Expense

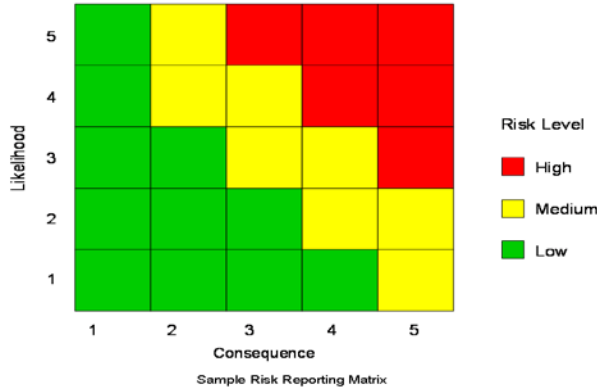


Obsolescence Risks

Risks may be identified through many means:

- News articles can warn of:
 - New platform extensions that could affect platform supportability
 - Regulatory changes
- Communication within the cross-functional team and Industry
 - Manufacturing challenges
 - Specification challenges
 - Ingredient availability
 - Supply chain issues
- OSD Critical Energetic Materials Working Group

Defining Risk Scope



- Once a risk is identified, determining its impact is critical
 - How many different items and platforms are affected?
 - What timeframe is available to mitigate the risk?
 - Are there any clear, easy to implement alternatives?

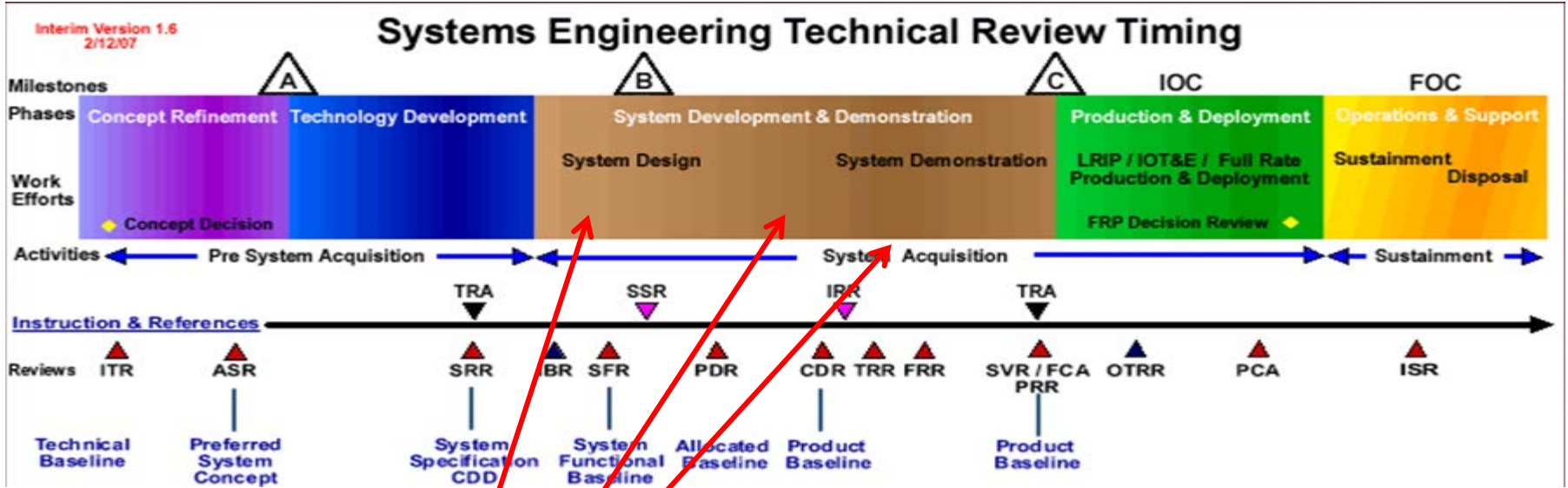
Mitigations

- When a change to the risk status of a material is identified, such as a plant closure announcement, parties with known uses for the material are notified
- Options for addressing the problem include:
 - Stockpile the material
 - Develop or qualify a second source for the material
 - Develop or qualify an alternative material
 - Develop or qualify an alternative item
- IDIQ contracts and CRADAs are valuable tools for enacting solutions in partnership with industry

Mitigations (cont.)

- Each risk or issue is handled on a case by case basis, but there are similarities between solution paths
- Several factors affect the path forward for obsolescence mitigation
 - If affected items share a design philosophy, some qualification data may be leveraged across families
 - Energetics should be characterized over the entire range of expected environmental exposures
 - The function of the obsolete material and the maturity of the alternatives dictate the level of risk that program offices are willing to accept in a test program

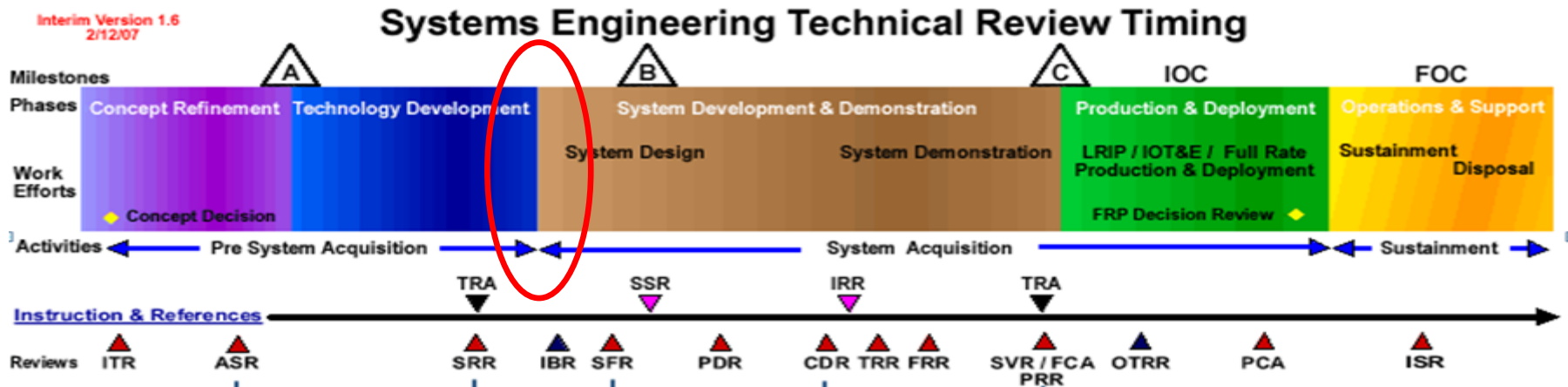
SETR Process



- Project Initiation
- Phase I (Design Feasibility)
 - Develop/Analyze/Engineer replacement item or material
 - Identify technical gaps / Hold PDR / Make go-forward decision
- Phase II (Design Verification)
 - Identify technical gaps / Hold CDR / Make go-forward decision
- Phase III (Qualification)

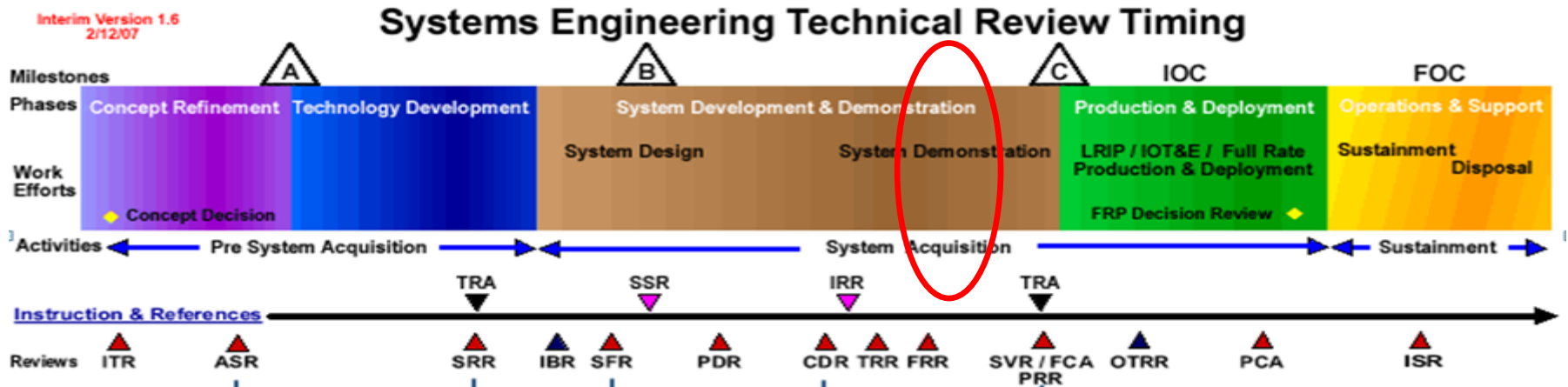
Example #1

- Item “A” is a rocket motor with a unique propellant formulation. One of the raw materials is no longer available. A potential replacement is available with similar burn rates and mechanical properties.
- The next expected need for Item “A” is in five years.
- Item “A” has a unique environmental and operational



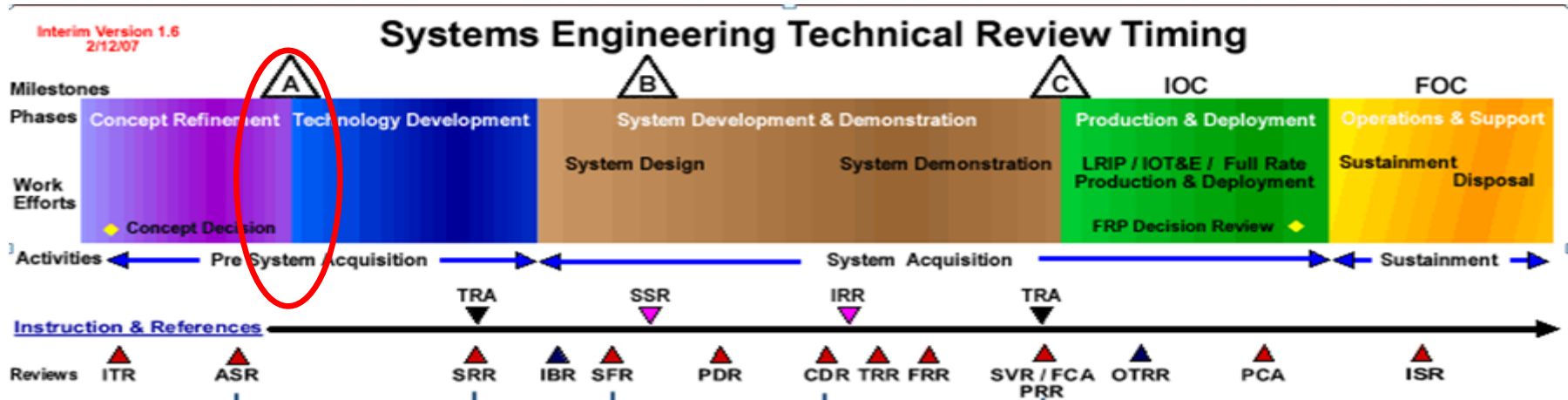
Example #2

- Ingredient “B” is used as a burn rate modifier in several CAD/PAD propellants. It is only available in the necessary grade from Vendor “X”, which has just announced they are ceasing manufacture in 6 months.
- Vendor “X” is willing to sell a stockpile of material before they exit the business
- Other manufacturers sell similar yet not-identical products



Example #3

- Energetic “C” is used in thousands of separate items across the DoD. Congress and the EPA have joined forces to phase out the use of the material over the next several years.
- Each of the thousands of items can be segregated into larger design families



Takeaways

- The strategies used to mitigate obsolescence must vary on a case-by-case basis
- Government can tailor item requirements based upon the maturity of the mitigation being introduced
- Early notification from Industry regarding potential issues can improve the response time and available options for mitigation
- Information sharing and solutions are promoted between government and industry teams

Anecdotal Trends

- Regulatory pressure to lessen environmental impact is increasing, particularly in Europe
- More and more energetic ingredients and materials are only available from OCONUS suppliers.
- Pedigree of an ingredient's source should be carefully considered prior to use – Buyer Beware
- Communication between organizations is still very limited.
- There is growing support within the DoD for addressing energetics obsolescence

REACH

- European Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals
- Defines the health and environmental risk of all chemicals produced, transported, and imported in the European Union (EU). Applies to all EU countries
- Candidate List – contains all chemicals considered as high risks to public safety
- Authorization List – Chemicals banned for production or use within the EU without express authorization
- Restricted List – Chemicals that may be used only within certain rules
- Chemicals are generally at high risk of EPA restriction

Specifications

- Out of date specifications can negatively affect supply of usable material
 - Obsolete Tests
 - Extraneous or redundant requirements (overspecification)
 - Under-specification
- Some efforts are underway to revise material specifications

Communication

- Government and Industry need to work together to make sure that problems are identified early enough to prevent acquisition issues.
- Regular communication is recommended to help address individual issues. We have already implemented this in some cases.
- Government and Industry can jointly develop solutions to obsolescence issues.
- A sidebar is planned for later on in this workshop to discuss obsolescence issues and communications strategies