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Obsolescence Considerations for Materials in the Lower Sub-Tiers of the Supply Chain

Jay Mandelbaum

Christina M. Patterson

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INSTITUTE FOR DEFENSE ANALYSES
4850 Mark Center Drive
Alexandria, Virginia 22311-1882

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IDA

Jay Mandelbaum
Christina Patterson

Overview

- Scope
  - Critical materials that are hazardous, exotic, or otherwise supply-constrained and appear in the lower level tiers of the items listed on the system's Bill of Materials (BOM), e.g.,—
    - Raw material (an element)
    - Engineered material (a chemical, an alloy)
- This presentation will present—
  - The questions that program management should address in determining whether critical materials in lower level tiers of the supply chain should be part of the program's obsolescence management efforts
  - A proactive approach to problem identification for critical materials

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The Case for Why This Might be Important

- Critical materials are likely to be incorporated into the system at a low level in the supply chain
  - The critical material is likely to exist below an item being surveyed or statused by a predictive tool
  - The company responsible for the critical material may not even be aware that it is destined for a DoD system
- Potential disruptions or changes in these lower level critical materials may not be immediately apparent or understood by solely statusing an item

ASSUMPTION:
Knowing whether there is a critical material present in or used in the manufacturing process of a material or mechanical item (and electronic items too) listed on a BOM will improve the analysis of availability for that material or item

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Prepare: Establishing Strategic Underpinnings

- Two questions to be answered by program management
  - To what extent should a program apply obsolescence management to materials (including critical materials in the supply chain) and mechanical items?
  - When should a program's efforts begin in these areas?

Responses to these questions assume that resources are constrained and a risk-based approach should be pursued

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Prepare: Prioritizing Obsolescence Effort as Part of Establishing Strategic Underpinnings (1 of 3)

- Two elements of prioritization
  - Prioritize the systems/sub-systems of interest
    - No changes to strategic underpinnings when mechanical items and materials are considered
  - Determine the items (including critical materials in the supply chain) in the sub-systems of interest to be monitored
    - This is where strategic underpinnings for monitoring materials and mechanical items (and electronic items too) should be explicitly considered

Three determinations should be made when establishing strategic underpinnings; one of which applies to critical materials that do not appear on a BOM

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Prepare: Prioritizing Obsolescence Effort as Part of Establishing Strategic Underpinnings (2 of 3)

- Determine the items (including critical materials in the supply chain) in the sub-systems of interest to be monitored
  - Items that are listed in a BOM
    1. Determine the heuristic algorithms to use to identify the families of materials and mechanical items (and electronics too) to definitely monitor
    2. Determine whether to further analyze uncategorized items
  - Critical materials that appear in lower level tiers of the items listed on the system's BOM
    3. Determine whether to investigate critical materials in the supply chain
       - Who is in the best position to research and mitigate any issues? Centralized approach may be best

Ultimately, program management must decide if and the degree to which to apply resources to identify material issues in lower tier suppliers based on perceived risk

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Prepare: Prioritizing Obsolescence Effort as Part of Establishing Strategic Underpinnings (3 of 3)

- **Determine when obsolescence management effort for materials (including critical materials in the supply chain) and mechanical items should begin**
  - **Early monitoring provides—**
    - **A larger window of opportunity to do something about an issue**
    - **The availability of a larger selection of less expensive resolutions**
    - **A smaller likelihood of schedule or readiness impacts**
    - **The opportunity for designs to be changed if they contain critical materials of concern**
    - **A baseline for understanding the critical material content of the system, as well as potential issues during sustainment**

BEST PRACTICE:
Begin proactive obsolescence management for critical materials should begin by the time of the preliminary design review

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Identify: Two Different Approaches

- **Materials and mechanical items (and electronics items too) that are listed in a BOM**
  - **Applies to the first two determinations from the strategic underpinnings on what to monitor**
    1. **Apply the heuristic algorithms to identify the items to definitely monitor**
    2. **Further analyze (as appropriate) uncategorized items where the heuristics did not provide a definitive answer**
- **Critical materials that appear in lower level tiers of the system**
  - **Applies to the third determination from the strategic underpinnings on what to monitor**
    3. **Investigate how critical materials in the supply chain or in a manufacturing process may alter the status of items being proactively monitored**
       - **Identify the lower tier critical materials of interest**
       - **Better understand the extent to which issues associated with these materials may impact monitored item availability**

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Identify: Analysis of Item Availability (1 of 3)

- **Two-Step Approach to Determination 3**
  1. **Select critical materials of concern**
  2. **Identify potential obsolescence issues associated with these critical materials of concern**

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Identify: Analysis of Item Availability: *Select Critical Materials of Concern* (1 of 4)

- **Critical materials of concern may be based on:**
  - **A master list of ALL critical materials**
  - **A list of critical materials where the availability of that material can be anticipated to be uncertain, due to a pending regulatory change or other potential supply disruption**
- **When making a choice, consider that critical materials can be categorized as—**
  - **Prohibited**
  - **Restricted**
  - **Or otherwise require Tracking**

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Identify: Analysis of Item Availability:
Select Critical Materials of Concern (2 of 4)

- Sources for creating a list of materials where there is availability uncertainty
  - For environment, health, and safety uncertainties
    - Chemical and Material Risk Management Program
      - Scans a variety of sources for emerging contaminants and issue alerts
      - Develops screening reports and places contaminants on watch list
      - Performs qualitative and quantitative assessments focused on identifying the enterprise risk posed by the contaminant
  - For conflict-driven material vulnerability uncertainties
    - Strategic and Critical Materials (SCM) List
      - Compiled through nominations from DoD components and others, serving as the basis for studies every two years that identify materials of interest or concern (potential for shortfall given planning scenario)
      - New additions to the list of materials of concern are of greatest interest from obsolescence perspective

In many instances it will be sufficient to create a list of critical materials where the availability of that material is uncertain or anticipated to be uncertain

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Identify: Analysis of Item Availability:
Select Critical Materials of Concern (3 of 4)

- Sources for creating a list of ALL materials
  - 2013 National Aerospace Standard (NAS) 411-1, *Hazardous Material Target List (HMTL)*
  - DLA's SCM list
  - International Aerospace Environmental Group's (IAEG) Aerospace and Defense Declarable Substance List (ADDSL)
  - Hazardous Substances covered under the EU's—
    - Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH)
    - Restriction of Hazardous Substances (RoHS)

Some programs may still judge that ALL critical materials are of concern

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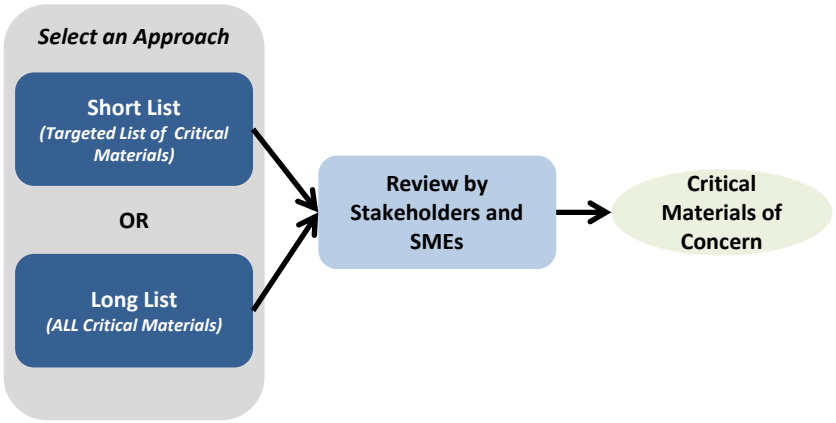
Identify: Analysis of Item Availability:
Select Critical Materials of Concern (4 of 4)



Regardless of the choice made to compile a list of critical materials of concern, obsolescence stakeholders should have an opportunity to contribute

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Identify: Analysis of Item Availability:
Identify Potential Obsolescence Issues Associated with Critical Materials (1 of 3)

- How can a program pursue a risk based approach to issue identification?
  - In absence of exacerbating circumstances indicating high risk, the most cost effective obsolescence management team (OMT) approach is: Communication, Communication, Communication!
    - Establish critical material supply chain issues as a OMT agenda item
    - Engage with stakeholders (in preparation for OMT meetings and other)
      - DLA(SCM)
      - Manufacturing Industrial Base Policy (MIBP)
      - Environmental risk alerts
      - Major OEMs within the supply chain
      - Material and environmental engineers in the program office
      - Cross-cutting materials SME within the Component

A typical proactive approach using vendor surveys/ research/ predictive tools would not normally be used

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Identify: Analysis of Item Availability:
Identify Potential Obsolescence Issues Associated with Critical Materials (2 of 3)

- **The purpose of communication regarding critical supply chain issues**
  - **Encourage stakeholders to be aware of issues, i.e.,—**
    - **Existing and potential issues of concern to others**
    - **What is being done about these issues**
    - **What conversations are taking place about these issues**
  - **Promote information sharing among stakeholders**
  - **Ultimately better position stakeholders to anticipate regulations changes and other market-driven disruptions that could impact critical materials in supply chains**
  - **Once a problem is discovered, the conversation can switch to "what to do about the problem"**
  - **Opportunity to establish a DOD-wide initiative**

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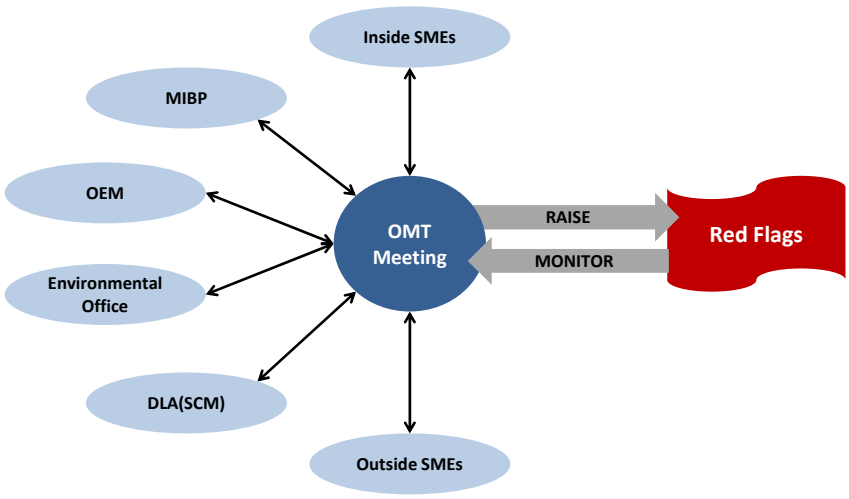
Identify: Analysis of Item Availability:
Identify Potential Obsolescence Issues Associated with Critical Materials (3 of 3)



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Identify: Analysis of Item Availability (2 of 3)

- **Pursuing problem identification and resolutions on a centralized basis**
  - **Further exploration by a program will be limited because critical materials are likely to be used on multiple platforms**
    - **Consequently, research and resolutions should be accomplished on a DOD-wide basis, not just a single program basis**
  - **Only in the highly unlikely case that the critical material is unique to the platform should the program carry out the assess, analyze, and implement steps of robust obsolescence management**
  - **Program's role is to scream and yell**

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Identify: Analysis of Item Availability (3 of 3)

- **Regardless of who ultimately does the research, some potential data sources include:**
  - **Industry associations**
  - **Organizations that track both recent and pending domestic and international regulation changes**
  - **REACH, RoHS, and conflict minerals data associated with items**
  - **Other technical data**

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Assess and Analyze

- **Obsolescence management processes performed as usual**

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Questions?

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14. ABSTRACT

Programs are generally unaware of risks for a material obsolescence lurking within the supply chain and by the time that the issue impacts an item, precious time may have been lost. This presentation will discuss several steps that a program can take to: (1) identify critical materials of concern; (2) involve all stakeholders in the subject; (3) locate information on the critical material(s) in question; and (4) apply the information collected to improve the obsolescence risk determination.

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