DoD Chemical & Material Risk Management Initiatives

Acquisition, Technology and Logistics

Hexavalent Chromium Minimization Strategy

DEPARTMENT OF DEFENSE
MERIT
Materials of Evolving Regulatory Interest Team

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Report Documentation Page

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Operating Environment & Trends

- **Use of Precautionary Principle**
  - We must understand health & environmental effects before using chemicals
- **Biomonitoring – What's showing up in humans?**
  - Centers for Disease Control's national biomonitoring & California voluntary program
- **Evolving Risk Assessment Science & Process**
- **Strict Chemical Management & Green Chemistry**
  - Cradle to grave management
- **International, Federal, & State Toxic Substances Laws**
  - EPA's Chemical Actions Plans & "Chemical Safety for Sustainability"
    - Restrictions or banning of chemicals/materials
  - California Green Chemistry Law
  - European Union's "REACH" regulation for chemical management
  - Pending TSCA[1] reform

[1] Toxic Substances Control Act

Chemical & Material Risk Management Directorate Portfolio

- **Emerging Contaminants Program**
- **Green Chemistry & DoD Chemical Management Program**
  - **DoD REACH Strategic Plan signed in July 2010**
- **E.O. 13514 "Environmental, Energy, & Economic Performance"**
  - **Strategic Sustainability Performance Plan signed June 2010**
- **ESOH Policies & Procedures for DoD Acquisitions**
  - **Use of Life Cycle Assessment to inject sustainability considerations into acquisition process**

Initiative - DoD Hexavalent Chromium Minimization

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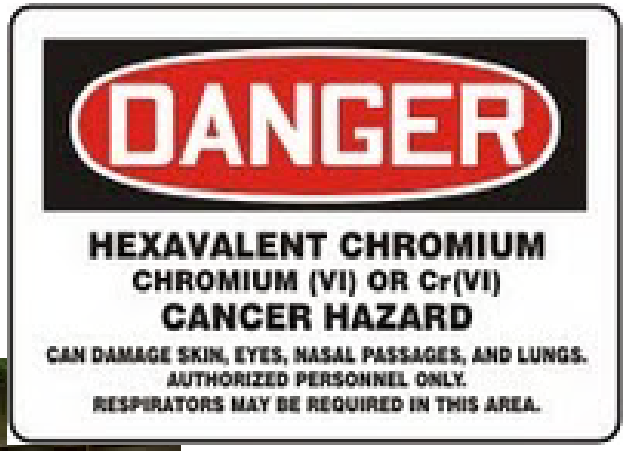
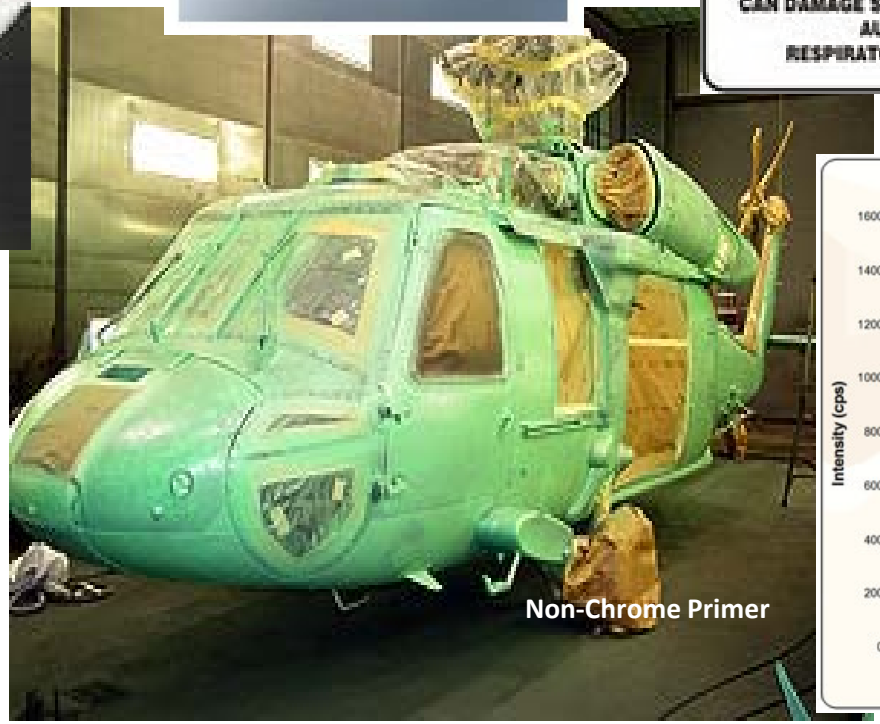
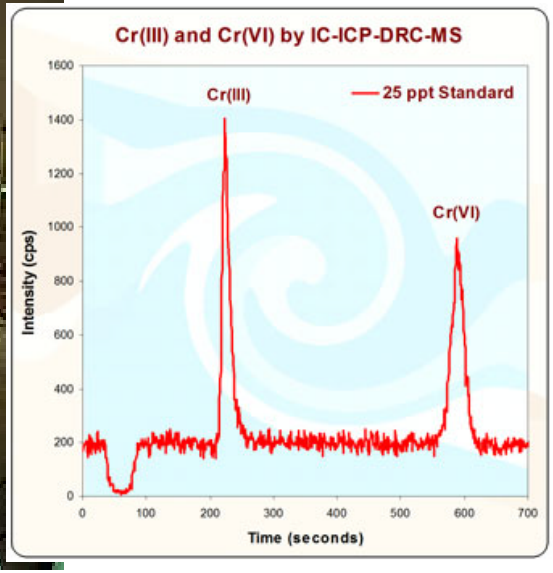






Desired DoD Paradigm Shift

- Default use of Cr6+
- “Promotion” of substitutes
- Can result in business as usual

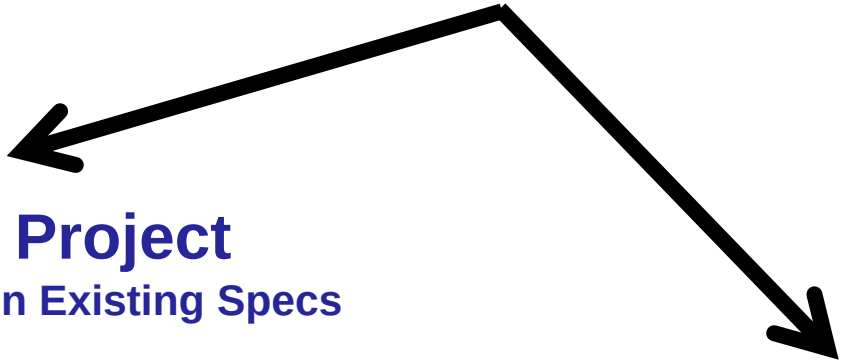
- Default use of substitutes
- Use of Cr6+ if no substitute can meet performance requirements
- Bias for change

Note: The required performance shouldn’t be based on Cr6+ but on a level of acceptable performance for the application

Three Part Cr6+ Strategy

Minimization Policy

Sets the Desired Course



Legacy Project

Minimizes Cr6+ in Existing Specs

Defense Federal Acquisition Rule

Minimizes Cr6+ in New Acquisitions

DFAR for Cr6+

(Defense Federal Acquisition Regulation)

- **Purpose: "Minimize hexavalent chromium in items acquired by DoD"**
- **Does not totally ban the use of hexavalent chromium**
- **Does provide a strong forcing function to use substitutes…where they can meet performance requirements**
- **Supports Executive Orders 13423 & 13514**
  - "reduce and minimize the quantity of toxic and hazardous chemicals and materials acquired, used, or disposed of."

DFAR for Cr6+

(Defense Federal Acquisition Regulation)

- **For new systems…requires executive level approval for deliverable with Cr6+…must certify no acceptable substitute**
- **Otherwise, limit is 0.1% by weight in homogeneous material**
  - Homogeneous material cannot be mechanically disjointed into different materials and is of uniform composition throughout
- **Limit does not apply to legacy systems and sustainment contracts**
- **For legacy systems…evaluate substitutes during system modifications & maintenance, as practical**
  - Legacy system defined as any program that has passed Milestone A as defined in DoD Instruction 5000.02

Practical Implications of Cr6+ DFAR

- **Affects mainly paints and primers**
- **Does not apply to Cr6+ produced as a by-product of manufacturing**
- **Will not affect chrome plating, anodizing, washing, conversion coatings**
- **Will help small businesses who have developed non-chromate products & processes**
- **Will help reduce use of Cr6+ where practical**

Summary

- **The DoD policy is proactive but practical**
  - It strikes the right balance between mission performance & the move to sustainable chemicals & materials

- **The chemical management world is changing…those who adapt early will be stronger**

Know what you are buying…know what's in your products

Initiative - Sustainable Chemicals & Materials Consortium

- **Only at the idea stages thus far**
- **Brainstormed with industry at the recent Association of Climate Change Officers meeting**
- **Concept:**
  - Coordinated, voluntary effort among DoD and industries
  - Identify, test, and evaluate sustainable chemicals & materials
  - Share information and lessons learned
  - Indentify & break barriers to implementation

Questions & Discussion

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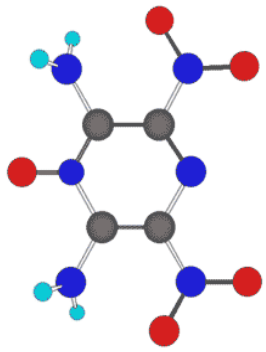
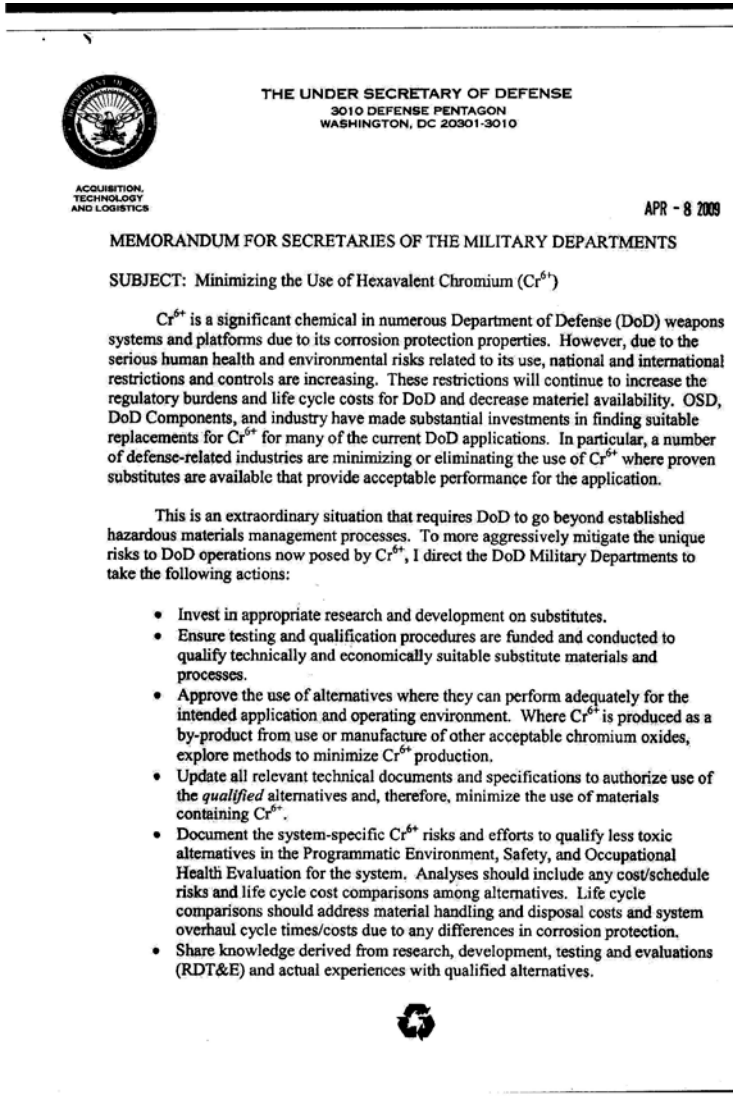


Back-up Slides

DoD Hexavalent Chromium Minimization Policy



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ACQUISITION, TECHNOLOGY AND LOGISTICS

APR - 8 2009

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS

SUBJECT: Minimizing the Use of Hexavalent Chromium (Cr^{6+})

Cr^{6+} is a significant chemical in numerous Department of Defense (DoD) weapons systems and platforms due to its corrosion protection properties. However, due to the serious human health and environmental risks related to its use, national and international restrictions and controls are increasing. These restrictions will continue to increase the regulatory burdens and life cycle costs for DoD and decrease materiel availability. OSD, DoD Components, and industry have made substantial investments in finding suitable replacements for Cr^{6+} for many of the current DoD applications. In particular, a number of defense-related industries are minimizing or eliminating the use of Cr^{6+} where proven substitutes are available that provide acceptable performance for the application.

This is an extraordinary situation that requires DoD to go beyond established hazardous materials management processes. To more aggressively mitigate the unique risks to DoD operations now posed by Cr^{6+}, I direct the DoD Military Departments to take the following actions:

- Invest in appropriate research and development on substitutes.
- Ensure testing and qualification procedures are funded and conducted to qualify technically and economically suitable substitute materials and processes.
- Approve the use of alternatives where they can perform adequately for the intended application and operating environment. Where Cr^{6+} is produced as a by-product from use or manufacture of other acceptable chromium oxides, explore methods to minimize Cr^{6+} production.
- Update all relevant technical documents and specifications to authorize use of the *qualified* alternatives and, therefore, minimize the use of materials containing Cr^{6+}.
- Document the system-specific Cr^{6+} risks and efforts to qualify less toxic alternatives in the Programmatic Environment, Safety, and Occupational Health Evaluation for the system. Analyses should include any cost/schedule risks and life cycle cost comparisons among alternatives. Life cycle comparisons should address material handling and disposal costs and system overhaul cycle times/costs due to any differences in corrosion protection.
- Share knowledge derived from research, development, testing and evaluations (RDT&E) and actual experiences with qualified alternatives.

What is an Emerging Contaminant?

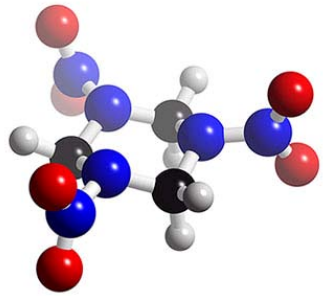
- Chemicals & materials that have pathways to enter the environment and present potential unacceptable human health or environmental risks…

and either

  - do not have peer-reviewed human health standards

or

  - Standards/regulations are evolving due to new science, detection capabilities, or pathways.



EC "Scan-Watch-Action" Process

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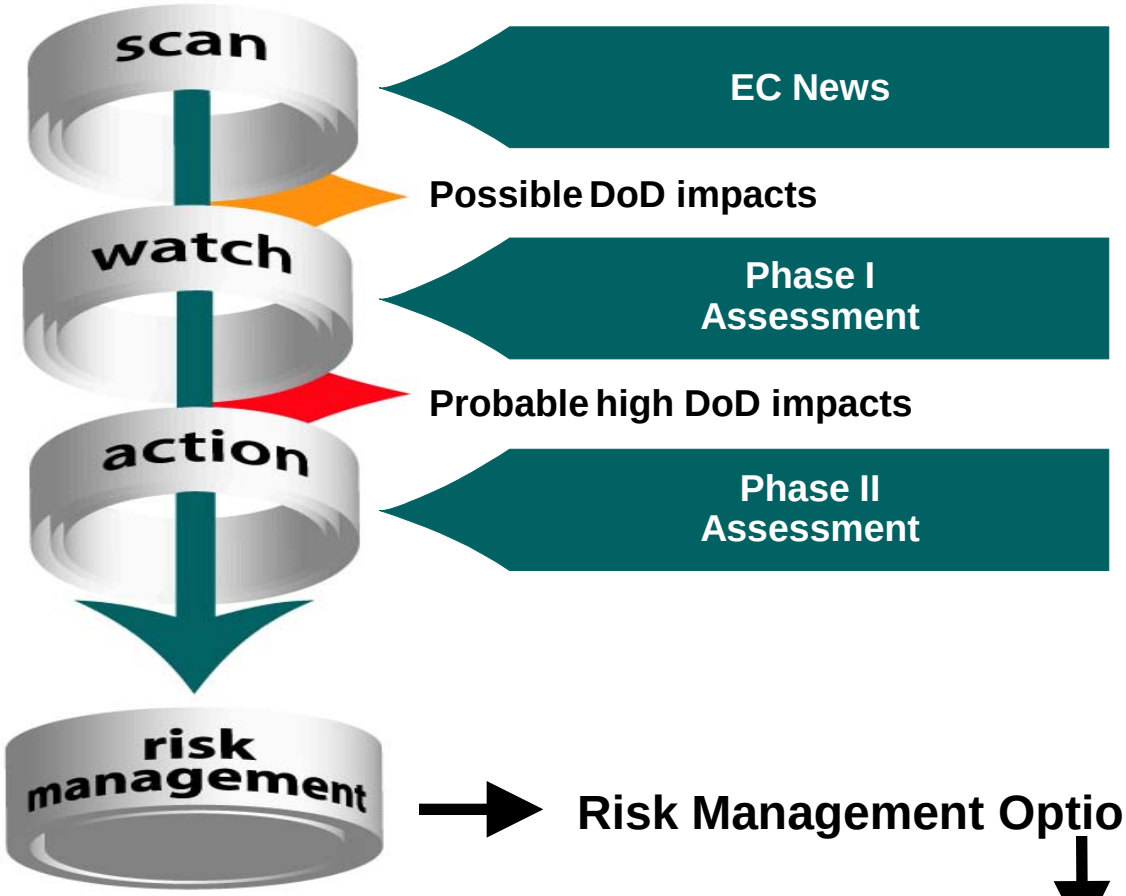

Review literature, periodicals, regulatory communications, etc.

Monitor events; Conduct Phase I qualitative impact assessment

Conduct Phase II quantitative impact assessment; develop & rank RMOs*

Risk Management Options (RMOs) to ECGC

Approved RMOs become Risk Management Actions (RMAs)