

Managing Emerging Contaminant Risks

- Plans & Progress -

Acquisition, Technology and Logistics

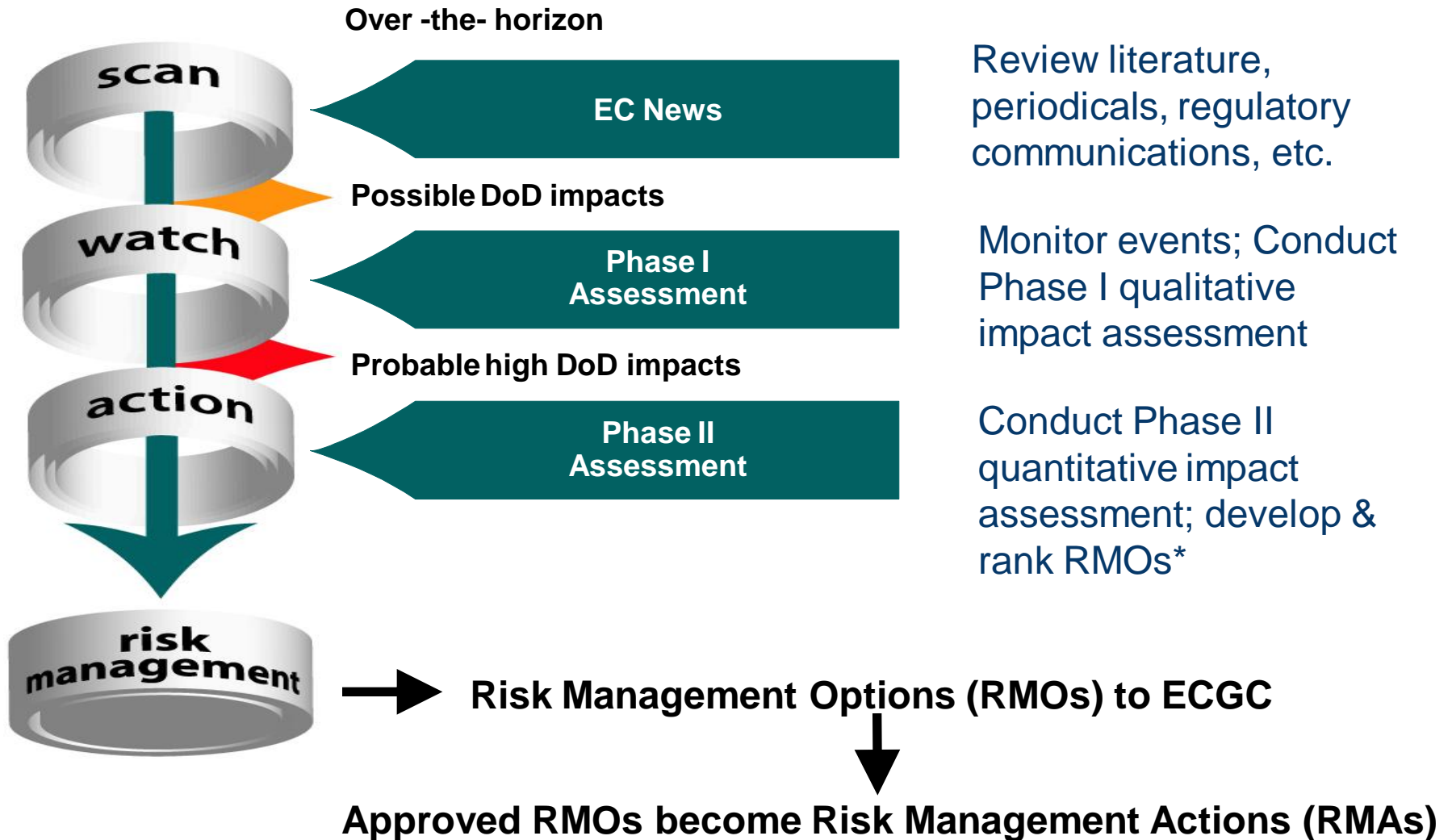


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EC “Scan-Watch-Action” Process

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EC Program Highlights

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- **Screened 342 potential ECs**
- **Completed 22 Phase I Impact Assessments**
 - Deployed “groupware” decision software
- **Completed 7 Phase II Impact Assessments**
 - 34 Risk Management Options (RMOs) approved...now underway or completed as Risk Management Actions (RMAs)
 - Beryllium, sulfur hexafluoride, hexavalent chromium, naphthalene, TCE, RDX, perchlorate¹
- **June 2009 DODI 4715.18 on Emerging Contaminants**

¹ Perchlorate was original EC – no Phase II assessment but RMOs developed and approved by ECGC

EC Program Highlights

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- **Perchlorate**
 - April 2009 DoD Policy
 - Sampling database > over 50,000 samples
 - Congressional, press, and EPA briefings to dispel perchlorate myths
 - GAO Review on perchlorate contamination
- **Developed data needs for assessing risk of chemicals & materials in development & acquisition process**
 - What physical/chemical/toxicological properties do we need to know about a chemical/material....and when?
- **Selected as finalist (top 2% of 600 nominations) for Harvard's "Innovations in American Government" Award**

EC Watch List

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- ✓ Tungsten alloys
- Sodium Tungstate
- ✓ Tetrachloroethylene (PCE)
- ✓ Dioxin
- ✓ 1,4-dioxane*
- Nanomaterials
- ✓ Perfluorooctyl sulfonate (PFOS)
- ✓ Di-nitrotoluenes (DNT)*
- ✓ Nickel
- ✓ Cadmium
- ✓ Manganese
- Cerium
- Cobalt
- Antimony
- ✓ Perfluorooctanoic acid (PFOA)...moved from action list
- **Phthalates**...recently added

✓ Phase I Impact Assessment completed

* To be re-assessed

EC Action List

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- ✓ **Perchlorate**
- ✓ **Royal Demolition eXplosive (RDX)**
 - **Cyclotrimethylenetrinitramine**
- ✓ **Trichloroethylene (TCE)**
- ✓ **Hexavalent Chromium (Cr6+)**
- ✓ **Naphthalene** ...may move to watch list
- ✓ **Beryllium (Be)**
- ✓ **Sulfur Hexafluoride (SF6)**
- **Lead**...added in Oct 09

✓ **Phase II Impact Assessment completed. All others initiated.**

Note: - Some risk management actions underway on all ECs including research on toxicity, substitutes, & treatment.

Key Risk Management Options (RMOs)

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- **SF6** - Policy & procedures for DoD-wide capture & recycling; Expanded R&D efforts for substitutes
- **Naphthalene** – Develop real time dosimeter
- **Hexavalent chromium** minimization policy
 - DFAR clause to prevent unauthorized entry to DoD
 - Develop an accelerated corrosion testing protocol
- **Beryllium**
 - Life cycle study - exposure points & end-of-life options
 - Respond to National Academy of Science Report
 - Use of Be-Lymphocyte Proliferation Test
- **Perchlorate** - Field guide for use of isotopic analysis

DoD Hexavalent Chromium Minimization Policy

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TECHNOLOGY
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THE UNDER SECRETARY OF DEFENSE
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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.



Some Facts

- Hexavalent chromium compounds are wonderful corrosion inhibitors
- Hexavalent chromium compounds are toxic
 - We've learned how to use them safely
 - It can be expensive to control, store, dispose
 - Liability issues always loom
- National & international procedures and regulations are tightening
- There are safer substitutes for some/many applications

Myth-busters

- The Dod policy does not ban the use of hexavalent chromium
- The policy does provide a strong forcing function to use substitutes...where they can meet performance requirements
- New systems...use requires executive level approval...certify no acceptable substitute
- Legacy systems...evaluate substitutes during system modifications & maintenance, as practical

DFARs Clause

DFARs = Defense Federal Acquisition Regulations

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- Purpose: Implement the DoD policy and prevent unwanted/unknown hex chrome products from entering the system
- Features
 - DoD can't specify hex chrome in contracts unless executive level approval...per the DoD policy
 - Contractors can't provide deliverables with hex chrome greater than 0.1% by weight
 - Contractors liable for providing unapproved hex chrome deliverables

Moral: Know what is in your products!


DoD Hexavalent Chromium Minimization Policy

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- The DoD policy is proactive but practical
- The chemical management world is changing...those who adapt early will be stronger

Latest EC Governance Council Decisions

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1. Endorsed SF6 RMOs
2. Endorsed Beryllium RMOs
3. Elevated lead to EC Action list  Why?
4. Downgrade naphthalene to EC Watch List pending confirmation of exposure levels
5. Transform the stand-alone REACH Executive Committee to a Working Group under the ECGC

Elevate Lead to Action List

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Reason #1

- **Human Health Risks from Phase I Assessment**
 - EPA risk assessment found that acceptable blood levels should be at least an order of magnitude lower
 - A likely “cascading” of changes to various regulatory standards based on acceptable blood levels
 - Changes will affect a number of DoD functions
 - Lead has many uses in DoD including munitions
 - EPA is preparing an Integrated Science Assessment

Air quality change from 1.5 ug/m³ to 0.15 ug/m³ & possibly lower

Elevate Lead to Action List

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Reason #2

- **Logistics/Supply Chain Risks Identified in Phase I Assessment**
 - European RoHS¹ regulations prohibit lead in electronics
 - Lead-free circuit boards use tin solder which forms “tin whiskers” leading to short circuits in critical components
 - Finding lead-free components is very difficult due to DoD’s global supply chain & sub-suppliers



¹ RoHS = Restriction of Hazardous Substances

Upcoming

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- **June - RDX Phase II Assessment Report & RMO comments due**
- **Phase I Impact Assessments**
 - July - DNT
 - Oct - Nanomaterials
 - Jan - Phthalates
- **August - Beryllium Life Cycle Risk Study**
- **August – Lead Phase II Assessment Report & RMOs**
- **Sep – EC Governance Council meeting**
- **Dec – Response to Beryllium NAS report**

Oh No! Another Yaroschak

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Any Questions ??

William Geoffrey Yaroschak
Born December 2009