



Emerging Contaminants Directorate

DoD Interests in Emerging Contaminants

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Imagine

if the largest industrial complex in the nation could...

- ❖ **Predict** which chemicals it used were most likely to pose human health and environmental challenges and be regulated in the future.
- ❖ **Develop** a consensus evaluation of risks posed to the sustainability of its mission.
- ❖ **Disseminate** rapidly new useful information on scientific and technical implications and options.
- ❖ **Leverage and strategically focus** intellectual capital and other resources on highest priority issues.



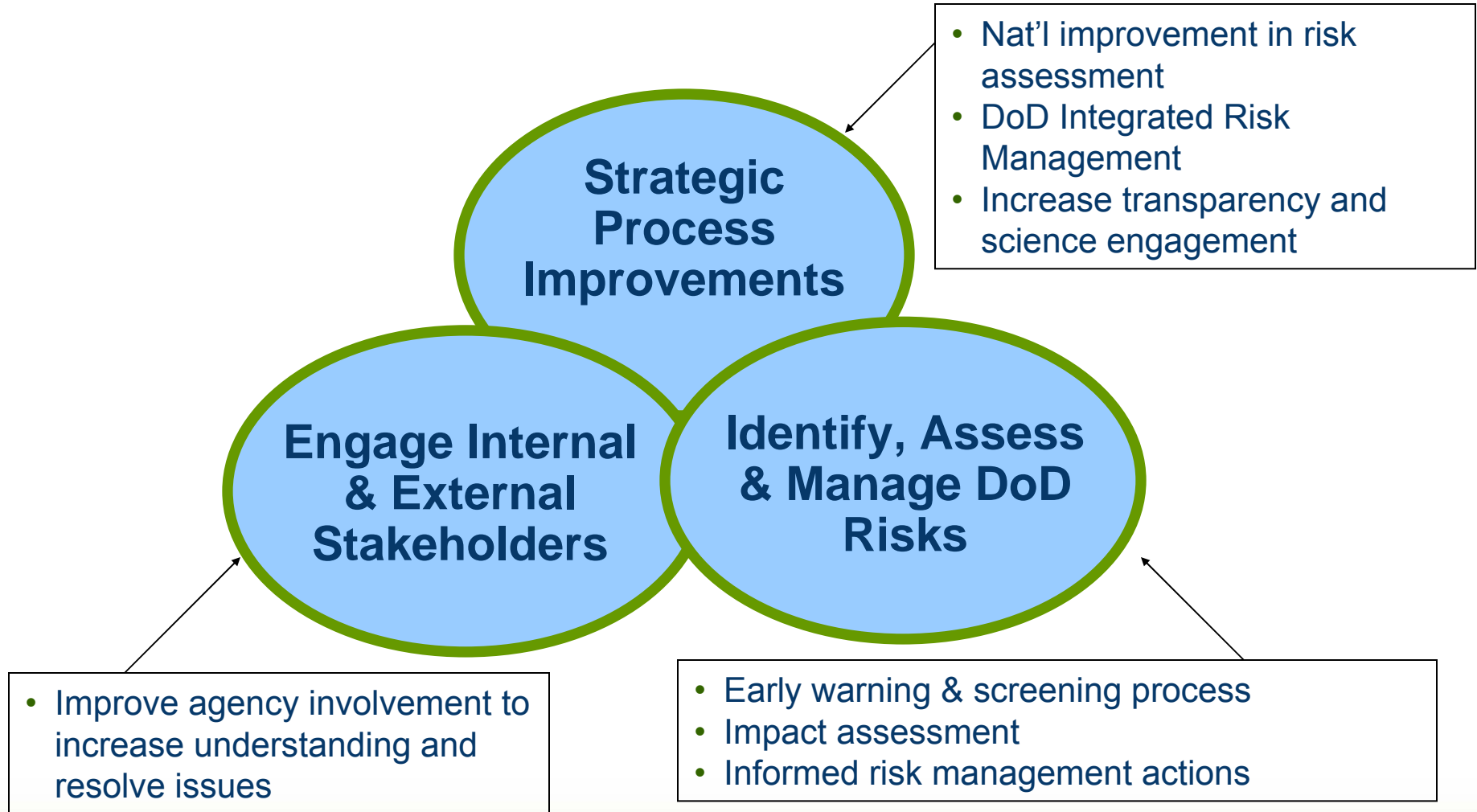
DoD Strategic Vision for ECs

Protect People & Enhance Readiness

- ◆ Ensure application of sound, thorough science in risk assessments
- ◆ Make processes transparent and inclusive
- ◆ Make sound risk management decisions on emerging contaminants



Three Part Strategy



Materials/EC Tracking Process

Over-the-Horizon Scanning



May be of interest

Review literature, periodicals, regulatory communications, etc.

Watch List



Probable mission or budget impacts

Monitor events; conduct rough impact analysis

Action List

Detailed impact analysis; launch risk management actions, including pollution prevention



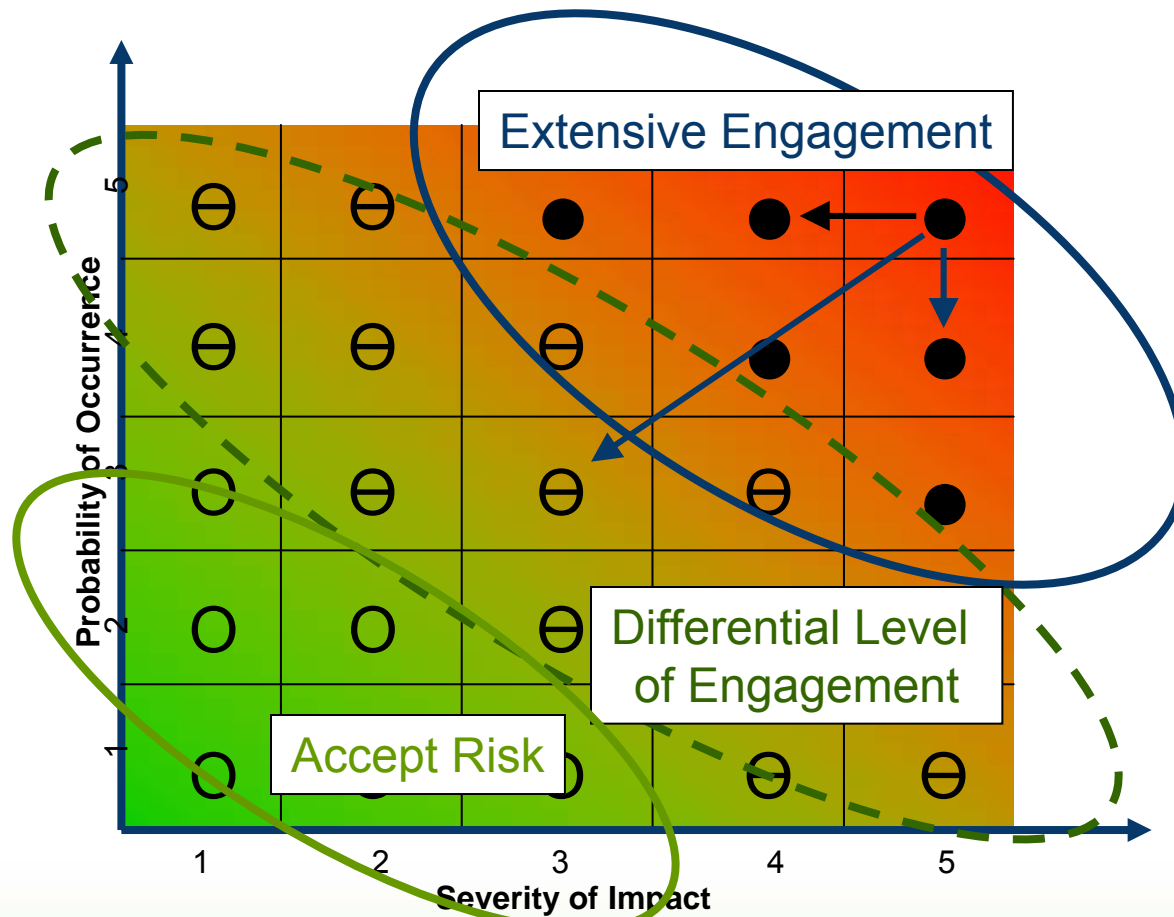
Phase I EC Impact Assessment

Probability of Regulation/Re-regulation				
Impact on DoD Functional Categories				
Environment Safety & Health	Readiness & Training	Acquisition	O&M of DoD Assets	Cleanup
H	H	H	H	H
M	M	M	M	M
L	L	L	L	L

Material and process decisions span functional areas 3 and 4



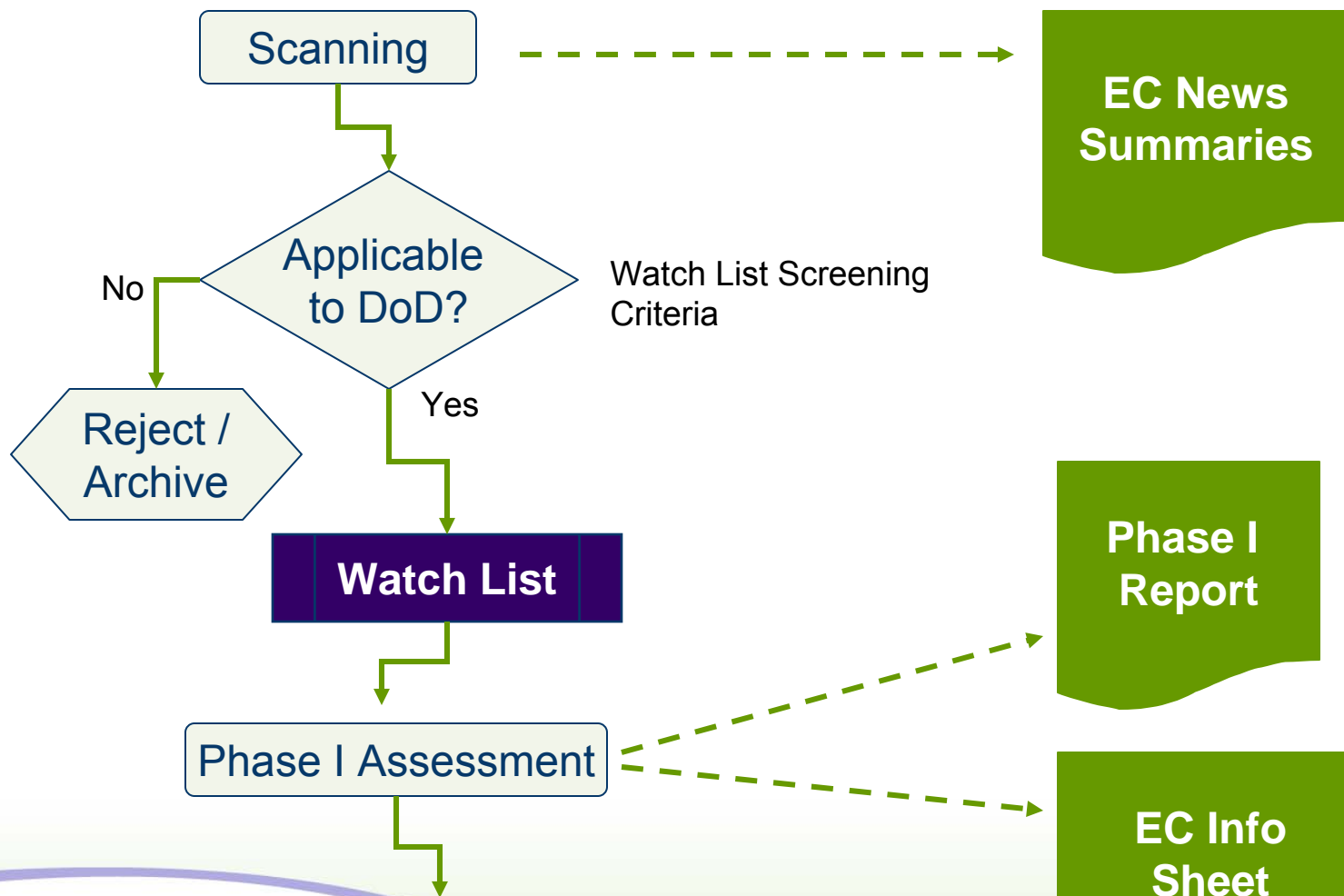
Integrated Risk Management Actions



- Risk Assessment
 - Fill science gaps
 - Exposure assessment
 - Benchmark with Industry
- Risk Management
 - Material substitution
 - Process changes
 - RDT&E
 - Acquisition changes
 - Benchmark with industry
 - Stockpile material
 - Increase compliance monitoring
 - Additional training
- Risk communication



EC Assessment Process - Part 1

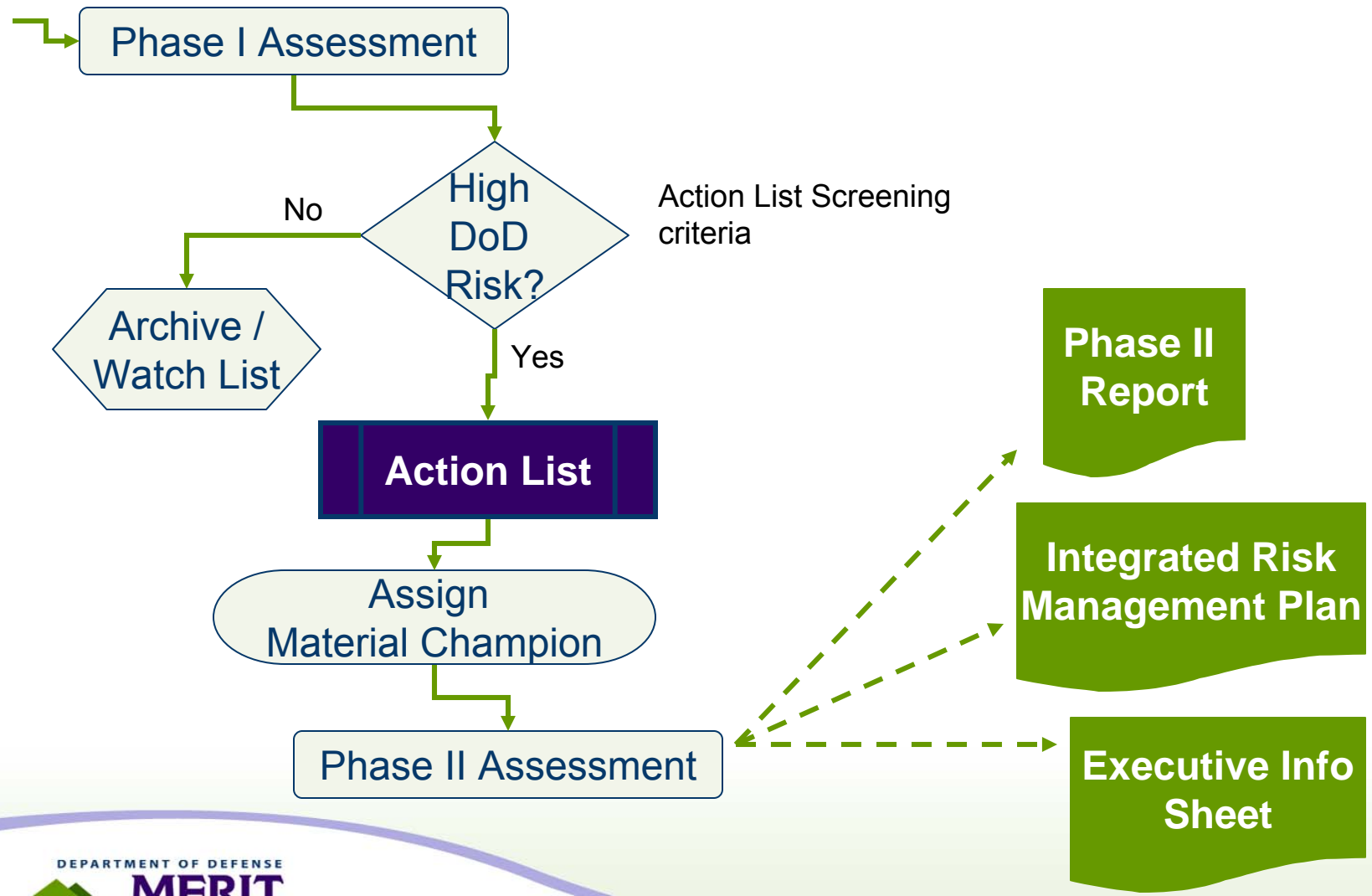


What is a Phase I Assessment?

- ❖ **An initial assessment of the likelihood that new regulations will be enacted, and the impacts those new regulations will have on DoD.**
- ❖ **What's required to conduct a Phase I Assessment**
 - ◆ An understanding of the reasons for regulatory change and their probability.
 - ◆ An understanding of where, why, how and how much of the materials subject to regulatory change; and the impacts the proposed regulations will have on our operations.
- ❖ **Working with the regulatory community to understand the reasons and risk of regulation is often easier than understanding the impacts proposed regulations will have on DOD.**
- ❖ **To make sound investment decisions, this situation must change.**
- ❖ **We need your help.**



Assessment Process - Part 2



What is a Phase II Assessment?

- ❖ **The same as a Phase I assessment, but much more detailed.**
- ❖ **Monetary estimates and operational assessments sufficiently detailed to support multi-million to billion+ dollar investment decisions in mitigation efforts.**
- ❖ **Mitigation efforts can include RDT&E, material substitution, process changes, protective equipment, new handling procedures, etc**
- ❖ **We need your help.**



Current Processes Inadequate

- ❖ **Data on material purchase and use scattered across DoD and its suppliers**
- ❖ **Databases do not communicate with each other**
 - ◆ Formats differ
 - ◆ Information collected is not consistent
 - ◆ Single point access not possible
- ❖ **Manual data calls notoriously inaccurate and incomplete**



Making it Better: EC Industrial Base Working Group

❖ Potential Membership

- ◆ DoD industrial policy
- ◆ Service acquisition commands
 - » Systems Engineering
 - » ESOH specialists
- ◆ DoD industrial facilities
- ◆ Defense Logistics Agency
- ◆ Other DoD material database resources
- ◆ Cognizant military authorities
- ◆ OEMs
- ◆ Providers of material management services

❖ Task

- ◆ Collect and synthesize comprehensive information about material uses and alternatives to support informed decision making



Differences - Watch & Action List

Watch List

- May impact DoD
- Limited analysis of impact – more qualitative
- Monitor external actions
- Updated regularly
- Short info sheets developed
- Minimal resources expended

Action List

- Likely to impact DoD
- Detailed analysis of impact – more quantitative
- Take RM actions
- Executive info sheets developed
- Significant resources may be expended
- “Material champion” assigned



Integrated Risk Management Plan

❖ **Engaging with regulators**

- ◆ Agreement on uncertainty factors, toxicity and levels
- ◆ Understanding on efforts needed to achieve mitigation

❖ **Mitigation Options**

- ◆ Identifying measures available to comply
- ◆ Identifying research needed to develop new materials, processes or handling procedures
- ◆ Estimating time and resources needed to comply

❖ **Communications**

- ◆ Clear consistent message from DoD
- ◆ May be the same as other users, may differ

❖ **Decision – best path forward**

- ◆ Invest in science to reduce uncertainty?
- ◆ Invest in mitigation?
- ◆ Combination of the two?



EC Watch List

- **Tungsten & alloys**
- **Tetrachloroethylene**
- **Dioxin**
- **N-nitrosodimethylamine (NDMA)**
- **1,4-dioxane**
- **1,2,3-trichloropropane (TCP)**
- **Nanomaterials**
- **Dichlorobenzenes**
- **Beryllium**
- **Polybrominated biphenyl ethers (PBDEs) and polybrominated biphenyls (PBBs)**
- **Di-nitrotoluenes (DNT)**
- **PFOS/PFOAs**
- **Lead**



EC Action List

- ❖ **Perchlorate**
- ❖ **Royal Demolition eXplosive (RDX)**
 - ◆ Cyclotrimethylenetrinitramine
- ❖ **Trichloroethylene (TCE)**
- ❖ **Chromium VI**
- ❖ **Naphthalene**



Imagine: Hexavalent Chromium

- ❖ **OSHA PEL reduced by factor of 10 -- At Navy facilities alone, affects 3200 workers**
 - ◆ Medical surveillance, Hazard communication, Recordkeeping
 - ◆ Protective work clothing and equipment. Respiratory protection
 - ◆ Separate hygiene areas and practices
- ❖ **If EC Directorate had been in place five years ago:**
 - ◆ Earlier engagement with regulators to reconcile dispute over proposed exposure limits
 - ◆ Earlier and more accurate assessment of impacts of proposed rule
 - ◆ Earlier and better funded R&D projects to improve knowledge of health risks to workers
 - ◆ Earlier and better funded R&D on alternative materials and processes



Imagine: Nickel-Cadmium

- ❖ **Used by military to plate jet engine compressor propeller blades**
 - ◆ Cd leached into wash water during standard maintenance
 - ◆ Wash water allowed to flow onto tarmac
 - ◆ Once environmental impact realized, wash water captured
 - ◆ Long-term solution: replace all coated blades with Al blades over 10 years

- ❖ **If EC Directorate had been in place when engine was first designed:**
 - ◆ Earlier understanding of Ni-Cd coating issues
 - ◆ Earlier and better funded R&D on alternatives to Ni-Cd
 - ◆ Environmental implications and costly retrofits could have been avoided



Imagine a future where...

- **Information is shared**
- **Perspectives exchanged**
- **Common definitions and processes exist**
- **Science priorities agreed upon and coordinated research conducted**
- **Environmental and public health liabilities are avoided**



Summary

- **EC management requires new thinking**

- ◆ Proactive vice reactive
- ◆ Investments before regulatory action

- **Potential large payback**

- ◆ Protects people, mission and assets
- ◆ Sustainable

**DoD Emerging
Contaminant Website!**

www.DODMeritinfo.net

www.DENIX.osd.mil

