THE UNDER SECRETARY OF DEFENSE
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ACQUISITION,
TECHNOLOGY
AND LOGISTICS

JUL - 8 2010

MEMORANDUM FOR SECRETARIES OF THE MILITARY DEPARTMENTS
CHAIRMAN OF THE JOINT CHIEFS OF STAFF
UNDER SECRETARIES OF DEFENSE
DEPUTY CHIEF MANAGEMENT OFFICER
COMMANDERS OF THE COMBATANT COMMANDS
ASSISTANT SECRETARIES OF DEFENSE
GENERAL COUNSEL OF THE DEPARTMENT OF DEFENSE
DIRECTOR, OPERATIONAL TEST AND EVALUATION
DIRECTOR, COST ASSESSMENT AND PROGRAM EVALUATION
INSPECTOR GENERAL OF THE DEPARTMENT OF DEFENSE
ASSISTANTS TO THE SECRETARY OF DEFENSE
DIRECTOR, ADMINISTRATION AND MANAGEMENT
DIRECTOR, NET ASSESSMENT
DIRECTORS OF THE DEFENSE AGENCIES
DIRECTORS OF THE DOD FIELD ACTIVITIES

SUBJECT: Managing Chemicals, Materials, and Impacts to Readiness from REACH: A Strategic Plan

The Strategic Plan at Attachment A outlines actions for the Department to manage the potential impacts to readiness from REACH. REACH, which stands for the "Registration, Evaluation, Authorization and Restriction of Chemical Substances," is a European Union (EU) regulation that will result in the ban of some chemicals and the restriction of others within the EU. Because of the global nature of supply chains, the regulation will affect the Department. In fact, the consequences of REACH extend beyond the EU and include changes in chemical availability and cost as well as the formulation of commercial-off-the-shelf products purchased by the Department. Our plan is designed to protect military readiness by minimizing negative potential impacts and unintended consequences of this regulation.

The plan is designed to: (1) protect the availability of REACH-regulated substances with significance to the DoD mission; (2) ensure the performance of substitute products that are adopted because of REACH; and (3) guard against REACH-related disruptions to defense supply chains. A summary of the plan's objectives, along with lead proponents, is at Attachment B.

DoD program managers must attend to shifts in material availability and product formulations to avoid harm to defense capabilities and defense alliance interoperability. Please distribute the Strategic Plan to offices under your cognizance, and use it to take appropriate actions. Keep my office informed of developments relating to REACH that have the potential to adversely impact readiness and training.

Thank you in advance for your assistance in this important matter. My point of contact is Dr. Carole LeBlanc at 703-604-1934 or carole.leblanc@osd.mil.

Ashton B. Carter PDUSD(ATL)

Attachments:
As stated

cc:
Assistant Secretary of Defense (Acquisition)
Director, Defense Research & Engineering

OVERVIEW OF DOD 'REACH' STRATEGIC PLAN MANAGEMENT

GOALS	SUMMARY OF OBJECTIVES	LEAD PROPONENTS
1. Protect the availability of chemicals with significance to the mission.	Determine the changes required to the Business Enterprise Architecture to capture and consolidate data; enhance DoD's current 'scan/watch/action' process to identify chemical/ material risks, locations, usages, and suppliers.	OUSD(AT&L)/I&E/BEI
		OUSD(AT&L)/I&E/CMRM
		DoD Acquisition & Logistics Subject Matter Experts (SMEs)
		OUSD(AT&L)/A/IP
2. Ensure the performance of substitute chemicals with significance to the mission.	Establish where/how substitutes are used, and the characterization of their risks; incentivize, adopt, and communicate information on qualified alternatives; develop inspection methodology for quality control, prior to shipping products to Components; research additional alternative materials and processes.	DCMA and DLA
		OUSD(AT&L)/L&MR
		DoD Program Managers
		DoD Acquisition & Logistics SMEs
		OUSD(AT&L)
		DoD Green Procurement Program Work Group
		OUSD(AT&L)/DDR&E/SERDP/ESTCP
3. Guard against disruptions to the defense supply chain.	Promulgate back-up plans for when certain materials become unavailable; determine alternative transportation methods as needed; notify ManTech of any unresolved manufacturing/supply problems.	OUSD(AT&L)/A/IP
		OUSD(AT&L)/DDR&E
		European Command
4. Facilitate defense exemptions as necessary.	Strategize for an inter-agency effort, including the EU Member States' Ministries of Defense, and the countries in the Area of Responsibility, to support any proposed defense exemptions on a case-by-case basis.	European Command (other Federal agencies' engagement, for example, the Department of State, is also expected)
5. Minimize negative impacts to Foreign Military Sales (FMS).	Continue to accommodate customer-funded requests for REACH-compliant products, while meeting U.S. commitments under FMS agreements.	DSCA
6. Assure that defense acquisition strategies meet today's and tomorrow's warfighter needs.	Consider KPP, KSAs in JCIDS; direct appropriate changes to MilSpecs, Standards, DFARS, and contract language; assess impacts to ILS; develop criteria to assess future chemical risks; deliberate chemical management in S&T programs; preclude the use of certain toxics in acquisition policy.	OUSD(AT&L)/I&E/CMRM
		JCIDS Service or COCOM Sponsors
		OUSD(AT&L)/DDR&E
		OUSD(AT&L)/DDR&E/DSPO and OUSD(AT&L)/DPAP
7. Capitalize on Environment, Safety, and Health (ESH) opportunities.	Strengthen existing ESH policies; improve the guidance for the assessment of human health and environmental risks; apply the principles of green chemistry for the protection of DoD assets wherever feasible; participate in industry forums to devise a mutually-prioritized research roadmap; integrate policies consistently across DoD.	DoD Component SMEs
		OUSD(AT&L)/I&E/CMRM
		OUSD(AT&L)/DDR&E/SERDP/ESTCP
8. Capitalize on chemical management opportunities.	Establish the DoD REACH Strategic Plan governance structure through a DoD IPT for global chemicals; draft a DoDD/I for sustainable chemical/material management; develop training for the use and dissemination of best management practices for chemicals.	OUSD(AT&L)
		OUSD(AT&L)/I&E/CMRM
		DAU
9. Plan for future regulations impacting chemical use, safety and availability.	Continuously improve this Plan, and the monitoring of proposed U.S. and foreign chemical and material management systems, to judiciously prepare DoD for future impacts of global regulatory initiatives, and their potential impacts to military readiness.	OUSD(AT&L)
		OUSD(AT&L)/I&E/CMRM

July 7, 2010

Department of Defense

Managing Chemicals, Materials, and Impacts to Readiness from REACH: A Strategic Plan

The European Union's Registration, Evaluation, Authorisation and Restriction of Chemical Substances

Limitations

This document is a strategic plan; it does not provide authority to take specific actions. Such authorization must be obtained through normal delegations found in other Department of Defense issuances and policy memoranda. All international agreements must comply with Department of Defense Directive (DoDD) 5530.03, International Agreements, and any other applicable issuance.

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EXECUTIVE SUMMARY

To promote military readiness, this Strategic Plan proposes nine Department of Defense (DoD) goals to manage the potential impacts of the European Union's (EU) Registration, Evaluation, Authorisation and Restriction of Chemical Substances (REACH)[1]. REACH puts the onus on manufacturers and importers of chemicals and products to prove their safety and restricts uses of especially toxic materials. This relatively new and complex EU law is fundamentally changing the way in which chemicals are regulated and products are formulated on a global scale.

REACH's potential impacts to military readiness require urgent action by DoD. Chief among the Plan's goals are:

- Protecting the availability of substances in the supply chain that have no viable substitutes and whose elimination would cause an adverse impact on the mission;
- Ensuring the adequate performance of substitutes that are adopted in mission-significant applications; and
- Guarding against disruptions to the supply chain, as a result of REACH.

DoD has experienced adverse impacts of a similar, but less sweeping EU law, the Restriction of Hazardous Substances (RoHS). Because of RoHS, electronic parts containing lead quickly became virtually unavailable worldwide, and commercial off-the-shelf (COTS), lead-free electronic parts were supplied to DoD Components without DoD's full understanding or control of the mission impacts. RoHS affected only six substances; REACH will affect more than 30,000.

Other goals include minimizing REACH's possible impacts on Foreign Military Sales (FMS) and monitoring the establishment and implementation of country-specific defense exemptions within the EU to ensure interoperability for the North Atlantic Treaty Organization (NATO) and other defense alliances. Additionally, DoD's acquisition strategies will need to be adjusted as the use of more chemicals and chemical-containing substances becomes further regulated, potentially decreasing material availability and increasing costs.

Collectively, the Strategic Plan's goals and associated objectives strive to:

- Identify strategies and solutions to promote potential positive, and minimize potential negative, impacts of REACH;
- Provide a roadmap to unify, coordinate and communicate those activities across the DoD; and
- Reduce the use of toxic and hazardous chemicals wherever feasible.

This last point demonstrates that some aspects of REACH correspond to existing DoD policy. In preparing for REACH, DoD should take advantage of this opportunity by reducing toxic and hazardous chemical exposure to its workforce and its surroundings. Positive outcomes include likely improvements to the environment and reductions in injuries and illnesses due to harmful occupational exposures. Achieving these reductions supports compliance with existing mandates, e.g., Executive Order (EO) 13423, "Strengthening Federal Environmental, Transportation and Energy Management," and other efforts towards sustainability already underway within DoD. Furthermore, the enterprise-wide management of the selection, acquisition, distribution, use, and disposal of chemicals will better prepare DoD for potential future regulatory initiatives. This lifecycle approach of anticipating developments at the international, national and state levels will inform the chemical-usage decisions made by the DoD today, and promote readiness tomorrow.

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[1]Definitions of other acronyms can be found in Appendix H.

The Strategic Plan also identifies key DoD stakeholders in executing these goals to preserve and enhance military readiness. Notwithstanding, the Plan's contributors unanimously agree that *the most significant goals and objectives will be unattainable if resources needed to effectively execute the Plan are not identified by DoD's leadership in a timely manner.*

Finally, REACH is in the early stages of implementation and its interpretation and enforcement processes will continue to evolve over many years. For instance, the impact of REACH on counterfeit product proliferation is yet to be determined, and REACH will eventually require changes to Safety Data Sheets for products containing nanomaterials. Consequently, this Strategic Plan will require both semi-annual reviews, at minimum, to monitor progress on the implementation of the Plan's existing goals, and annual updates as necessary to ensure the Plan's objectives and metrics are developed to protect DoD's future interests.

Summary of the Plan's nine goals to preserve and enhance military readiness:

- *Protect the availability of REACH-regulated chemicals and materials identified by DoD as having significant mission impact;*
- *Ensure the performance of substitute chemicals and materials;*
- *Guard against disruptions to the supply chain;*
- *Facilitate and resolve defense-exemption issues in Europe related to REACH;*
- *Minimize negative impacts to foreign military sales;*
- *Assure acquisition strategies for DoD systems adequately address the management of risks associated with REACH;*
- *Capitalize on environment, safety, and health opportunities;*
- *Capitalize on chemical management opportunities; and*
- *Plan for future regulations.*

WHAT IS REACH

REACH is a relatively new and complex EU law that fundamentally changes the way in which chemicals are regulated. The law applies to all manufacturers and importers in all EU member states (MS) and some non-member countries. REACH contains no blanket exemption for military products or activities. For purposes of REACH, DoD does not import equipment or supplies into the EU when it is providing such items in direct support to its forces stationed in the EU nor when transporting such items through the EU on military transportation. However, REACH will still have potentially significant consequences for DoD and our allies – due to expected shifts in product formulations and the global nature of defense supply chains – that require DoD's immediate attention and action.

The primary aim of REACH is to ensure a high level of protection of human health and the environment from the risks posed by chemicals. To accomplish this, REACH establishes a new paradigm; it shifts the burden of proof from requiring governments to prove chemicals are unsafe, to requiring industry to prove their safety. Without this information, products cannot be sold on the EU market. REACH makes industry responsible for assessing and managing chemical risks, and for providing appropriate safety information to their users. REACH is the first law to regulate not only chemicals, but products containing chemicals. REACH requires (1) public disclosure of chemical substances in, or released by, products and disclosure of toxicological information; and (2) greater visibility and accountability of chemical substances across the supply chain from original equipment manufacturers to the makers of individual parts. REACH also restricts use of highly dangerous substances. Consequently, REACH can be expected to restrict many chemicals important to the manufacturing, maintenance, and operation of weapon and support systems.

Full implementation of REACH will take years, and the full extent of its effects is impossible to predict. A new EU agency, the European Chemical Agency (ECHA), was created to oversee its implementation. The first phase of implementation involved the pre-registration of all chemicals imported to, or produced in, the EU in excess of one metric ton/year by December 1, 2008. Pre-registration allowed companies to keep their products on the EU market until formal evaluation and registration occurred. Using information gathered from the pre-registered chemicals, ECHA has organized industries using the same chemical for similar purposes into consortia to share the cost of developing toxicological data. Since REACH went into effect in 2007, ECHA has focused on high-volume chemicals and the prioritization of Substances of Very High Concern (SVHCs), which ECHA defines as toxic to reproduction, carcinogenic, mutagenic, persistent, bioaccumulative and toxic (PBT) and very persistent and very bioaccumulative (vPvB), with an eye toward reducing consumer exposures. In 2009, ECHA identified 15 SVHCs. These substances pose risks to human health or the environment that the EU deems unacceptable. ECHA has established controls on manufacture, use, or placement of SVHCs on the EU market. Each year, ECHA is expected to propose a similar number of new chemicals that may be subject to authorization before placement on the EU market; however, non-governmental environmental and consumer protection groups have pressed for more aggressive action.

Industry concerns stemming from enhanced consumer awareness over chemicals in products, as well as the cost of supplying sufficient toxicological information to prove their safety, is already changing product formulations with the discontinuance of certain chemicals. Over the next decade, 30,000 substances are expected to be registered under REACH. ECHA will determine if the registration dossier is REACH-compliant and will verify whether or not adequate information is provided. ECHA can also select substances for a broader evaluation. Therefore, the regulatory fate of some chemicals and the possible effects of DoD will be unknown for many

years. Perhaps most significant to DoD is that REACH requires a system to ensure that SVHCs are properly controlled, and progressively replaced by suitable alternative substances or technologies where economically and technically viable. Where this is not possible, the use of substances may only be authorized where there is an overall benefit for society, that is, where the risk of using the substance is warranted.

As a consumer protection law, REACH was not developed with the military in mind. The MS authorities are responsible for enforcing REACH through inspections, and assessing penalties in cases of non-compliance. Defense exemptions are possible, but must be sought by individual MS ministries of defence (MODs) and are required to be narrowly focused on unique military products and applications. Defense exemptions only apply to DoD activities in the EU in cases where DoD purchases an item that needs to be imported into the EU for delivery by the seller. The seller would then have to secure any necessary defense exemptions if the item contained chemicals or materials regulated by REACH. To date, few EU nations have developed processes for such exemptions, and obtaining them appears labor intensive. DoD is aware of some discussions by EU allies to explore the creation of consistent processes for the submission and review of defense exemptions, but additional work is needed. For more information on REACH, refer to Appendix A.

WHY PLAN FOR REACH

The intent of REACH is to reduce the use of toxic and hazardous chemicals in the EU, for an unspecified number of chemicals identified over time. With its roots in consumer protection, a major goal of REACH is to expand the transparency of exposure information to consumers. Because of the nature of the global marketplace, such restrictive laws are likely to drive changes in chemical and material practices – sometimes in unforeseen ways.

A similar but less sweeping law provides an illustration. Adopted in February 2003, the Restriction of Hazardous Substances Directive (RoHS) became effective on July 1, 2006, in all of the EU member states. RoHS restricts the use of six hazardous materials in the manufacture of electronic and electrical equipment: lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, and polybrominated diphenyl ethers. Though European in origin, RoHS had ramifications for the electronics industry worldwide. Virtually overnight, manufacturers of electronic devices such as computers switched from leaded to un-leaded components. For most commercial applications such as personal computers and peripherals, this did not represent an insurmountable technical challenge in terms of performance criteria, as many of these products are routinely replaced by consumers within as few as 18 months. Not so for military hardware, which oftentimes must operate for years, even decades, and under extreme conditions.

As defense and aerospace applications constitute less than 1% of the world's electronics usage, space- and military-related electronics are effectively niche markets, unable to appreciably influence electronics manufacturing. Soon after RoHS' implementation, military specifications and standards notwithstanding, electronic devices inventoried by the Defense Logistics Agency (DLA) for the DoD Components as COTS contained un-leaded versions of products formerly assumed to contain lead. The replacements for leaded solder, in particular, are associated with the formation of 'tin whiskers'[2] and unpredictable component malfunction, with potentially catastrophic and expensive weapons systems' platform failures. This apparent quality control failure is illustrated in Figure 1. .

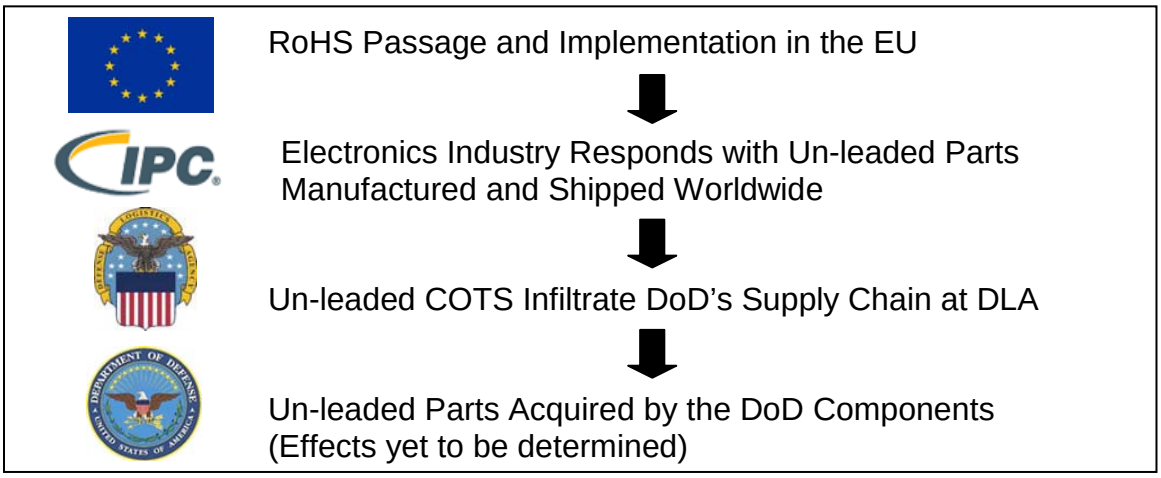


Figure 1. UNINTENDED CONSEQUENCES OF RoHS ON DoD

This illustration underscores the need to have an overall leader within DoD to ensure that sufficient resources, including funding, are allocated to respond to REACH in a timely fashion.

[2] For more information on tin whiskers, see "A History of Tin Whisker Theory: 1946 to 2004", George Galyon, IBM, http://thor.inemi.org/webdownload/newsroom/Presentations/SMTAI-04_tin_whiskers.pdf , July 23, 2004 and "Metal Whiskers: Failure Modes and Mitigation Strategies Jay Brusse / Perot Systems", Dr. Henning Leidecker, NASA Goddard et al, http://nepp.nasa.gov/whisker/reference/tech_papers/2007-brusse-metal-whiskers.pdf, Dec. 5, 2007.

Like RoHS, REACH initially concentrates on increasing the regulation of SVHCs, with the aim of eventually restricting the use of some SVHCs such as PBTs and vPvBs for certain, if not all, applications.

REACH is far more sweeping than RoHS because it applies to many more chemicals. Rather than an out-right chemicals ban, REACH will require the registration of approximately 30,000 chemicals over the next 10 years. REACH will require information not only on chemicals but, for the first time, the products that contain them known as 'articles.' Examples of possible articles include fire extinguishers and printer cartridges, since they contain chemicals of concern that are intentionally released.[3] Consequently, some estimates place industrial compliance with REACH as 12-times the cost of RoHS.[4] According to one recent survey, many company professionals expected to bear the brunt of REACH reporting are less than optimally prepared.[5]

The EU established ECHA to manage the chemical information compiled for REACH. Some of this information will have previously been considered proprietary; other information will be unknown, and testing will be required.

Voluntary Substance Information Exchange Forums (SIEFs) have been created within industry to help gather and disseminate this information in the form of dossiers for each substance. Non-governmental organizations (NGOs) and the public may request these dossiers, which creates the potential for the release of sensitive/classified information if the proper procedures are not in place and enforced.

While DoD has neither standing nor need to participate in SIEFs, defense original equipment manufacturer (OEM) participation is expected. ***The cost of SIEF participation will be passed on to customers, including DoD.***

Many DoD suppliers may not be fully aware of REACH's registration requirements merely to continue doing business in the EU. For these reasons, the DoD's supply chain may be at risk. Furthermore, REACH's applicability to military applications was not considered by the European Commission; ECHA personnel do not currently have security clearances, and websites that may be used for electronic reporting purposes may not be sufficiently secure for militarily-important information. Finally, there is no blanket defense exemption under REACH. Expected commercial outcomes of REACH and consequential potential impacts to DoD are summarized in Table 1.

EXPECTED OUTCOMES ON COMMERCE	POTENTIAL IMPACTS TO DoD
Limiting/eliminating some chemical availability	Negative effects on U.S. military operations and maintenance in the EU and elsewhere
Decreased material availability and increased costs for certain chemicals/articles	Disruption to defense supply chains outside the EU due to the global nature of supply
Undisclosed substitution of chemicals in COTS	Failure or marginal performance of weapon systems or components of weapon systems
Increased equipment costs passed on to foreign customers when substitute materials are available to satisfy individual country requirements	Increased equipment costs *eventually* passed on to DoD
Different interpretations of REACH by each of the EU / participating states (30)	Disruption of U.S. and NATO interoperability (e.g., FMS)
Accidental release of proprietary information	Accidental disclosure of classified or controlled unclassified information (e.g., ITAR[6])
Accelerated need to test and evaluate substitute materials	Increased DoD research, development, testing, and evaluation (RDT&E)

Table 1. EXPECTED OUTCOMES AND POTENTIAL IMPACTS OF REACH ON DoD

[3] The Automotive Industry Guideline (AIG) on REACH, Version 2 (January 23, 2008) states that while the global Automotive Industry has identified fire extinguisher systems as articles once assembled onto a vehicle, "these same articles, if imported on their own…would be considered containers with preparations" instead.

[4] "Department of Defense Briefing on Impacts of the EU REACH Legislation," Tony Hilvers, Vice President and Sahar Osman-Sypher, Project Manager, IPC: The Association Connecting Electronics Industries, July 16, 2008.

[5] "Results of IPC Survey on REACH Preparedness in the North American and European Electronic Interconnect Industry," July 2008.

[6] International Traffic in Arms Regulation under the auspices of the Department of State (DOS).

While most of the points in Table 1 apply to weapon systems in current use, the final point illustrates that over time, the performance, cost, and schedule of the acquisition of new weapon systems will also be impacted by REACH-driven chemical and material commercial availability. DoD cannot readily manage the consequences of REACH without a Strategic Plan. There are already conflicting opinions from official bodies within the EU on the status of key military items such as munitions and torpedoes.

The gravity of the known potential impacts of REACH, coupled with the unknown risks associated with this regulation or, for that matter, new versions of RoHS by other nations such as China and Korea, emphasize the need for DoD to take strategic steps *now* to understand and mitigate these risks. Doing so will have the added major benefit of preparing DoD for domestic legislative drivers that could have similar repercussions on DoD's supply chains, including (1) versions of REACH-like, green chemistry initiatives under consideration by some states (e.g., California); (2) proposed amendments to the Toxic Substances Control Act of 1976 (TSCA) based on the following principles of the U.S. Environmental Protection Agency (EPA) (for more information, visit www.epa.gov/oppt/existingchemicals/pubs/principles.html):

- Safety standards should be based on sound science and protective of health and environment;
- Manufacturers should provide the information needed to conclude that chemicals are safe;
- Risk management should take into account sensitive populations, cost and availability issues;
- Manufacturers and EPA should act in a timely manner on priority chemicals; and
- Green chemistry, transparency, and public access to information should be strengthened.

Finally, preparing to meet REACH's communication requirements will help DoD plan for other potential changes. For example, the current Occupational Safety and Health Administration (OSHA) Hazard Communication Standard may be modified to align more closely to the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). See, www.osha.gov/dsg/hazcom/ghoshacomparison.html#footnote2.

Important Considerations

*An **article** is defined by the EU to mean "any object that has been given a specific shape, surface or design which determines its function to a greater degree than does its chemical composition." Examples of articles include manufactured goods or products ranging from textiles and toys to electronic chips and furniture. While only substances* (not preparations or articles) must be registered under REACH, **a chemical in an article must be registered if the substance is released from that article as part of its function by design, for example, a printer cartridge. A chemical in an article may also be REACH-regulated if it is an SVHC, whether or not its release from the article is intentional, that is, by design.***

**Helpful Analogies (food stuffs are not regulated under REACH)*
Substances = Flour, Sugar, Water
Preparation = Dough
Article = Cake

DoD will not attempt to define words, e.g., product, beyond the legal scope of REACH.

STRATEGIC PLAN VISION

As an EU regulation, REACH is not a compliance issue for the DoD, although it does have significant implications for DoD's supply chain, its industrial base and, consequently, the performance of DoD's mission. **Ultimately, the goal of this Strategic Plan is to protect national security by promoting military readiness, not only during this early stage of REACH's implementation, but as it evolves and is enforced in the future.** To do so, this Plan will need to be revisited periodically as REACH is implemented and its scope of influence becomes clearer.

STRATEGIC PLAN PURPOSE

The purpose of DoD's Strategic Plan for REACH is **to promote military readiness** by:

- Identifying the strategies and solutions that must be executed to promote potentially positive and minimize potentially significant negative impacts from the REACH regulation of chemicals and materials;
- Apportioning these responsibilities to the appropriate DoD offices and personnel;
- Providing a roadmap to unify, coordinate, and communicate these activities across the DoD;
- Reducing the use of toxic and hazardous chemicals wherever feasible; and
- Outlining the resources needed to achieve these actions.

TOP STRATEGIC GOALS AND OBJECTIVES

The quality control failure described in Figure 1 maximized the risks to readiness, to RoHS. In contrast, the proposed path forward in response to REACH is illustrated in Figure 2. This recommendation is predicated on a policy framework, originating with the creation of the Emerging Contaminants Directorate in 2006 by the Deputy Under Secretary of Defense for Installations and Environment (DUSD(I&E)), now incorporated into the Chemical and Material Risk Management Directorate (CMRMD). This framework stresses the management and communication of risks associated with the use of a chemical by DoD following a lifecycle assessment, from its selection to its disposal.

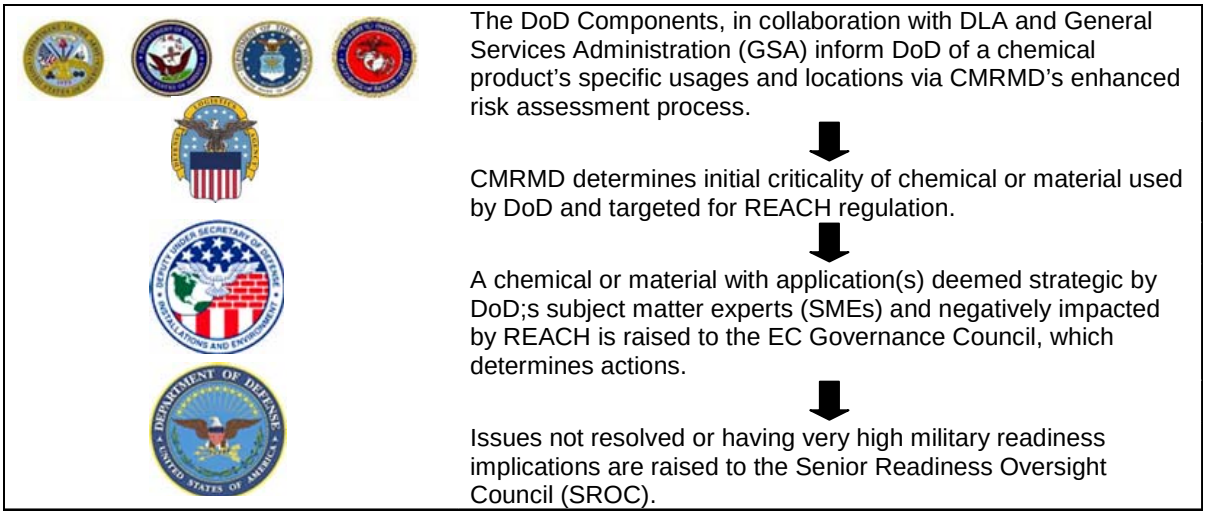


Figure 2. ANTICIPATING CONSEQUENCES OF REACH ON DoD

The following nine goals and their associated objectives were developed to inform this decision-making process and key decision-makers[7]. Some goals have overlapping objectives; others have multiple benefits and beneficiaries. While goals 1-8 are mostly near-term and necessary, benefiting U.S. military readiness and the national security interests of our allies, some of these goals' have research-oriented objectives to meet DoD's future needs. Work on these objectives must be initiated now, to ensure that needs are met. Goal 9 is more long-term, and aimed at adapting to expected further chemical and material restrictions.

Specialty chemicals used for high-tech purposes (for instance, stealth coatings) are not the only materials under consideration for REACH. Of great concern are the presence of chemicals and materials of hidden significance to the mission; those whose discontinuance as a consequence of REACH could have very real, and very negative impacts. An example could involve the use of a common chemical degreaser used for engine cleaning. Alternatively, the continued use of a toxic or hazardous chemical when there are viable alternatives does not help DoD personnel, the environment, or DoD's public image, especially if DoD is the sole remaining user.

Where possible, proponents have devised metrics to gauge the success or failure in meeting a particular objective. Future versions of the Plan will require identification of additional metrics to improve the due diligence of the chemical selection process. All of the goals should be viewed as trying to promote military readiness by cultivating an organization that is nimble, agile, and successful in facing an ever-changing world.

[7] Unless otherwise described, the term 'Program Manager' used throughout this document is meant to encompass those offices with management responsibility (for example, the cognizant engineering authority) for fielded items, including rapidly fielded items for urgent warfighter needs.

GOAL #1: PROTECT THE AVAILABILITY OF REACH-REGULATED CHEMICALS AND MATERIALS IDENTIFIED BY DOD AS HAVING SIGNIFICANT MISSION IMPACT.

DoD must ensure its access to those chemicals and materials required to accomplish its mission. To achieve this, DoD needs current, accurate information about what chemicals and materials it uses and where. DoD must also track restrictions and changes in product formulation to rapidly identify potential mission-impact risks to DoD. DoD will also need greater understanding of chemical and material market trends to secure their supply.

Objective 1.1: Determine what changes are required to the Business Enterprise Architecture (BEA) to address the capture and consolidation of data for chemicals and materials identified as having significant mission impacts, and modify business systems.

Proponents	
Lead:	Business Enterprise Integration (BEI)
Support:	DoD Component Process Owners, DLA, ER&S, CMRMD, COCOMS
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☒	Requires significant additional resources – Program Objective Memorandum (POM) issue
☐	Funding requirements not estimated
Deliverable:	Determination of the changes required to BEA to capture and consolidate data
Metric:	Delivery of BEI study document
Other Partners (if any):	

Explanation: The BEA provides a blueprint for DoD business transformation, helping to ensure the right capabilities, resources, and materiel are rapidly delivered to our warfighters. Expanding the DoD BEA to guide the capture and consolidation of data on the use and location of the chemicals and materials identified as priorities by the DoD Components is a necessary first step in helping to alleviate the lack of visibility into DoD's key questions about its use of chemicals and materials: *what, where, why, and how much.* Case in point: during the development of chemical reduction plans in 2008 pursuant to EO 13423, each of the Services described varying degrees of difficulty in establishing mandated toxic and hazardous chemical reduction goals due to a lack of current chemical usage baselines. Consequently, an enterprise-wide solution is needed to support and improve DoD's management of mission-sensitive chemicals and materials. The BEA guides and constrains the implementation of interoperable defense business systems in accordance with 10 U.S.C. § 2222.

In this process, existing and new information technology (IT) systems, including the multiple databases currently employed by CMRMD, will be compared to a set of agreed upon DoD business data and process requirements, such that the functional needs of the communities of interest are developed and used to identify optional courses of action. The role of Combatant Commands (COCOMs) would be to ensure that the focus remains on chemicals and materials of significance to the mission. The European Command (EUCOM) is expected to rely heavily on DLA for information and assistance.

Once the identification and tracking of REACH-regulated items is included in the BEA, and implemented in all logistics systems supporting our European forces, e.g., Single Standard Army

Logistics Enterprise, Navy's Enterprise Resource Planning (ERP) Program, and DLA's Enterprise Business System. DoD Component process owners can populate the information, including the uses of each chemical/material and its geographic locations within DoD, the geographic locations of suppliers, and eventually include information on alternatives. This information capability will ensure the necessary access to supplier and location data, and to alternative chemicals and materials.

Some newer tools are available, such as the Weapon System Impact Tool which could be utilized to gauge the impact that changes to specifications will have on future weapon systems readiness. Other IT solutions may involve accelerating synchronized ERP, capabilities that incorporate both logistics and Environment, Safety, and Health (ESH) requirements, and provide better visibility into chemical and material usages.

Any IT solution must include analyses of both the business and operational security requirements, and comply with DoD Instruction (DoDI) 8500.02 and all other DoD information assurance policies. In addition, all IT system investments must be approved by their respective Investment Review Boards. Otherwise, the system may not meet the user communities' needs.

Objective 1.2: Expand the current CMRMD chemical 'scanning' process to include the identification of potential targets of REACH regulation that are of interest to DoD.

Proponents	
Lead:	CMRMD
Support:	DoD Component Environment, Safety, and Health (ESH) Organizations
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Monthly scanning of REACH-regulated chemicals and initial investigation into current usages by DoD
Other Partners (if any):	

Explanation: By modifying existing CMRMD processes (Appendix B) that include defense hazardous material management systems, DoD can effectively determine the importance of the DoD's continued use of a chemical or a material and its regulation under REACH. These improvements will have the additional benefit of helping to satisfy existing mandates under EO 13423 and EO 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," to reduce toxic and hazardous chemical usage.

Objective 1.3: Establish the extent and significance of the specific uses of the chemicals and materials identified in Objective 1.2, including geographic locations, as part of the ongoing CMRMD chemical 'watch' process.

Proponents	
Lead:	DoD Component Acquisition and Logisitics Leads
Support:	DLA, CMRMD, ER&S, Program Managers (PMs)
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Completion of assessment of Component-specific impacts of REACH-regulated chemicals as currently used
Other Partners (if any):	GSA

Explanation: DLA has already taken steps to meet this objective by providing the DoD Components with information about products that DLA suspects might be REACH-regulated in Europe. Continuing this objective will enable the Assistant Secretary of the Army for Acquisition, Logistics, and Technology, the Assistant Secretary of the Navy for Research, Development, and Acquisition, and the Assistant Secretary of the Air Force for Acquisition to focus their efforts on those military applications that are apt to be impacted by REACH, in particular, legacy systems, and provide an early warning indicator of the need for a possible defense exemption. See (1) Appendix C for a list of the first SVHCs identified for REACH and an overview of their major uses, including military applications, and (2) scroll down the page at http://echa.europa.eu/consultations/authorisation/svhc/svhc_cons_en.asp for a list of chemicals as presently proposed for regulation under REACH.

This assessment must necessarily address the impact REACH may have on configuration management, as is the case with RoHS. RoHS will have a significant impact on configuration management since the tin compounds used in place of lead in the manufacture of original equipment manufacturer (OEM) products may differ from the composition of, e.g., piece parts, components, and solders used by the OEM during repair and the DoD during maintenance. In other words, the original material composition needs to be known to complete a repair that meets reliability requirements, especially on aircraft.

Relatively minor investments lead to more sustainable decisions, based on more accurate chemical and material estimates for future availability and costs. Beneficiaries of this objective include: (1) research communities (Director, Defense Research and Engineering (DDR&E), particularly the Strategic Environmental Research and Development Program and the Environmental Security Technology Certification Program (SERDP/ESTCP)); (2) acquisition communities; and Logistics and Materiel Readiness (L&MR)); and (3) EUCOM and Environmental Readiness and Safety (ER&S) in supporting a defense exemption by an EU Ministry of Defense (MOD), as necessary, for U.S. mission requirements in Europe.

Many 'greener' products available today are in ample supply, since this market is newer. As this market matures, and REACH is further implemented, these products may be subject to increased demand. Consequently, this goal may need to expand to ensure the availability to DoD of substitute chemicals and materials with significance to the mission adopted as a consequence of REACH, and not just the toxic and hazardous chemicals and materials that are restricted by REACH.

Objective 1.4: Characterize the risks associated with the use of the chemicals and materials so identified to determine if action is necessary.

Proponents	
Lead:	CMRMD
Support:	OSD, DoD Component SMEs, EUCOM, ER&S
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Completion of 3 Phase II REACH-related chemical assessments, based on the EU's previous and expected implementation rate for REACH
Other Partners (if any):	

Explanation: Objectives 1.2, 1.3 and 1.4 work together to focus the DoD on the chemicals and materials of highest concern to the Department. The CMRMD will then apply a modification of the existing phased impact assessment that characterizes the relative risks (i.e., likelihood and severity) of those priority chemicals or materials to five distinct mission functional areas (Appendix B).

Objective 1.5: Identify suppliers of chemicals and materials with significant mission impact to (a) gauge their continued availability and (b) understand the market trends that influence their availability, to secure their supply.

Proponents	
Lead:	DLA/IP
Support:	L&MR, DCMA, IAC, DoD Components, Program Offices/Managers
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Market report(s) identifying the likelihood of key suppliers continuing to provide products containing REACH-regulated chemicals for mission significant applications
Other Partners (if any):	GSA, Contractors

Explanation: The organizations identified as proponent leads are the primary support agencies for this objective under the following scenario. Because DoD policy encourages the use of COTS products, DoD must be prepared for the influx of substitute ingredients in commercial products that can be expected as a consequence of REACH. Following the identification of those products containing REACH-regulated chemicals that are both significant to the mission *and* whose use is restricted by REACH, DoD needs to be vigilant, assessing the significance to the DoD of shifts on the potential increasing cost and decreasing availability of 'pre-REACH' formulations. This objective will ensure that DoD avoids the costs associated with being the sole remaining user for all but the most significant mission impact chemicals and materials. Successful implementation of this multi-part objective will require leadership of more than one defense support organization, specifically:

- To gauge the continued availability of chemicals/materials (part a), DoD Components, Program Offices/Managers, and contractors are best suited to identify the manufacturers of the chemicals and materials of new weapon systems, and to assess the likelihood of continued availability of these substances. The support for chemicals and materials used in existing systems falls to DLA or GSA.
- To assess the effects of market trends on chemical/material supplies (part b), DLA and the Defense National Stockpile (DNS), which is part of DLA, are best suited to understand market trends and their consequences to product availability. Nevertheless, a gap may exist in the current state-of-the-art for market research at DoD that needs to be addressed in future versions of the Plan. Specifically, the term, 'materials' is defined in the legislation guiding the operation of the Stockpile to mean minerals and metals, as opposed to chemicals. Moreover, issues of chemical shelf-life make it difficult for DoD to prepare for REACH by stockpiling. As a result, securing 'chemicals' and 'materials' as defined under REACH may not be completely supportable by DNS.

Industrial Policy (IP) becomes involved in cases affecting availability for multiple programs.

Examples include the shortage of a chemical used in solid rocket propellant, or a serious challenge in getting enough thin, armor steel for Mine Resistant Ambush Protected (MRAP) vehicles. IP would act in an advisory role, with support from others such as the Defense Contract Management Agency (DCMA) / Industrial Analysis Center (IAC) as necessary.

GOAL #2: ENSURE THE PERFORMANCE OF SUBSTITUTE CHEMICALS AND MATERIALS IN SIGNIFICANT MISSION IMPACT APPLICATIONS THROUGHOUT DOD'S SUPPLY CHAIN THAT ARE ADOPTED AS A CONSEQUENCE OF REACH.

After RoHS banned lead, DoD experienced unpredictable component malfunction as manufacturers substituted other materials despite DoD specifications. REACH is expected to result in significantly more substitutions and formulation changes; already industries are reformulating and redesigning products. To continue to trust in the performance of its equipment, DoD must ensure that substitute products meet defense-unique requirements, and that unqualified substitute chemicals or materials are not introduced into the supply chain. DoD must also evaluate the performance of proposed substitutes, and determine where their adoption is both feasible and advantageous in terms of lifecycle costs. Awareness of industry efforts to identify commercial substitutes or process improvements will help DoD identify potentially significant impacts and safeguard the mission.

Objective 2.1: Establish where and how these substitute chemicals and materials are, or may be, used.

Proponents	
Lead:	DCMA & DLA
Support:	DoD Component Contract Managers, EUCOM, ER&S
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Determination of treatment of unauthorized substitutions in new DoDI for counterfeit material under development (est. completion, May 2010)
Other Partners (if any):	GSA

Explanation: There are two actions to this objective. First, steps need to be taken to avoid the unacceptable situation in which an unknown and unqualified substitute chemical or material is used in a significant mission impact application, especially with regard to COTS. DoD must remain in a position to know the constituents of these products, in order to continue to trust the performance of its equipment. While DLA's strength lies in the Agency's ability to collaborate with customers, DLA is responsible for issues pertaining to non-conforming parts only for those contracts that it manages. DCMA reports to the Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)). DCMA was formerly known as the Defense Contract Management Command (DCMC) and reported to the DLA. In contrast to the DCMC focus on inspection of actual parts for quality control, DCMA's present activities focus on the quality of contract documentation. Given the increase in counterfeit products infiltrating DoD systems (see section on 'Imminent Concerns'), *this Plan recommends that the Office of the Secretary of Defense (OSD) oversight for product quality control (QC) needs to be re-instituted as a consequence of REACH, in addition to existing contract management protocols.*

Second, DoD should consider modifying certain performance criteria to prohibit the use of certain chemicals, chemical families, or those that exhibit unwanted characteristics. Product performance specifications presently place few limitations on chemical formulations. The formulation of a degreaser for DoD, for example, is typically dictated only by its performance as a cleaner. Any ingredient, even one that is a carcinogen, a flammable agent, or a high volatile organic compound , may be used. The failure to prohibit these kinds of chemicals in these kinds

of products has resulted in a wide range of chemical compositions being supplied under one National Stock Number/specification, some of which may contain ingredients that are not desirable and may not even be required for acceptable performance. The intent of this action, however, is not to constrain the DoD Components' selection of those chemicals and materials they deem as having significant impact to the mission for which there are no suitable alternatives.

Objective 2.2: Assess the impacts from the use of these substitute chemicals and materials to determine if actions are necessary.

Proponents
Lead: L&MR (issue-specific policy promulgation), DLA (execution of those policies)
Support: DoD Component Item Managers
Funding
☐ Can be accomplished with existing staff / resources
☒ Can be accomplished with funding adjustments / reprioritization
☐ Requires some additional resources by cognizant fiscal management office
☐ Requires significant additional resources – POM issue
☐ Funding requirements not estimated
Metric: <Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):

Explanation: Impacts of introducing new chemicals can be significant and expensive. For example, substitute chemicals may meet performance requirements but degrade more rapidly. Compensating for the degradation of substitute chemicals, such as lubricants, may require increased preventative maintenance cycles, including increases in system repairs due to increased wear. Also, substitute chemicals often require process changes for their use; a substitute chemical may require a multi-step process to do what was previously done in one step (e.g., adhesives) as well as additional procedures (tooling, etc.). Accordingly, substitute products, such as in cleaners and lubricants, should be tested for long-term impacts, such as moisture retention/intrusion and surface pitting and corrosion, to ensure these products do not introduce new failure modes. Otherwise, the potential exists for increased maintenance hours, revisions to maintenance procedures, new maintenance equipment, manpower, training, and potential reliability degradation.

Objective 2.2 is intended to cover those items that have been fielded for a number of years, are no longer managed by a program office, or are serviced by DoD maintenance facilities on a regular basis. It addresses reliability issues from switching to new chemicals used in the *maintenance* of a system. Conversely, Objective 6.2 addresses reliability issues from new chemicals used in the *development* of a system under the jurisdiction of the PM.

Objective 2.3: Characterize the risks associated with the use of these substitute chemicals and materials to determine if actions are necessary.

Proponents
Lead: PMs
Support: CMRMD
Funding
☐ Can be accomplished with existing staff / resources
☒ Can be accomplished with funding adjustments / reprioritization
☐ Requires some additional resources by cognizant fiscal management office
☐ Requires significant additional resources – POM issue
☐ Funding requirements not estimated
Metric: <Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):

Explanation: In support of PMs, CMRMD will apply a modification of existing phased impact assessments to characterize relative (i.e., likelihood and severity) risks of identified potential substitute chemicals and materials to five distinct mission functional areas, as explained in Objective 1.4.

Objective 2.4: Develop incentives in order to evaluate and implement chemical and material substitutes.

Proponents	
Lead:	DoD Component Acquisition and Logistics Leads
Support:	PMs
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: While there are a multitude of individual efforts and potential substitute materials, there is neither incentive nor requirement for a PM to implement them.

Systems in the pre-Milestone B (Figure 3) acquisition category may be less problematic for material changes than those in production, but affected PMs and OEMs will still require some incentives to approve material substitutions. OEMs are required to provide warranty/guaranty for the delivered system components, without field experience with many of these substitutes, OEMs are often reluctant to implement them. PMs normally follow OEM recommendations.

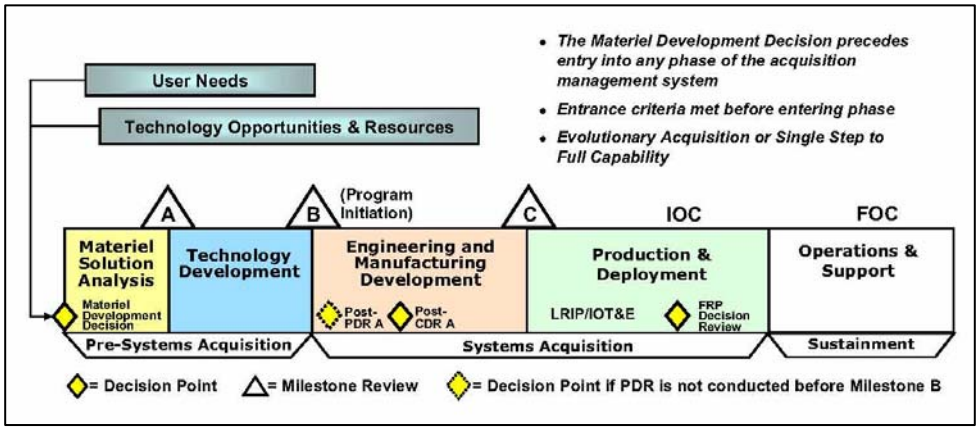


Figure 3. MILESTONES IN DEFENSE ACQUISITION[8]

Aside from the potential financial, natural resource, and energy benefits resulting from greener alternatives, a 'carrot-and-stick' program that combines rewards and penalties is needed to encourage the adoption of material substitutes. A recent DoD contract illustrates this approach, whereby the contractor "will earn additional fees if it meets certain performance metrics, or penalized if it does not."[9] This reward system must conform with acquisition guidance for which the PM is held accountable.

[8] DoDI 5000.02 (enclosure 2), December 8, 2008.
[9] "DoD Awards Unisys Multimillion Dollar RFID Contract," *RFID Update*, June 14, 2007, www.rfidupdate.com/articles/index.php?id=1381.

Objective 2.5: Ensure the adoption of substitute chemicals and materials having already met acquisition performance criteria.

Proponents	
Lead:	OUSD(AT&L)
Support:	PEOs, DDR&E, CMRMD, JS3 Working Group, JG-PP, DLA
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Establish a lead to identify those substitute chemicals and materials for adoption
Other Partners (if any):	GSA

Explanation: The adoption of substitute materials requires three discrete steps: identifying the chemicals, approving their use for a certain purpose, and their procurement. This objective applies to all acquisitions, including major systems acquisitions. Only the PM can make the final determination whether to use, or not to use, a chemical or material in a weapon system under the PM's authority, based on the program's performance, cost, and schedule requirements. At a point in the development of a weapon system that enables the insertion of the best available technology, the PM needs to consider the lifecycle costs of the chemicals and materials, including maintenance, used throughout the lifespan of the platform. Since these weapon systems often endure for many decades, achieving this objective will have the added benefit of protecting the available supply of REACH-regulated chemicals and materials for those applications for which no substitute meets defense-unique performance criteria. Not all items are managed and procured by the PM or the Program Executive Office (PEO), however, and those other command and agency authorities need to be likewise engaged. Also, this goal will require the proponents to advocate for the development and implementation of a streamlined process for testing substitute chemicals to meet military specifications in order to encourage adoption of the alternatives.

SERDP/ESTCP's efforts to promote adoption of innovative, environmentally friendlier chemicals and materials at DoD are augmented by chemical and testing information disseminated by Advanced Surface Engineering Technologies for a Sustainable Defense, or Asets Defense (www.asetsdefense.org). Other defense groups involved in related efforts include:

- The Joint Service Solvent Substitution (JS3) Working Group was established to facilitate open communication, encourage collaboration, and promote a coordinated response to solvent issues. This group derived a methodology for establishing the Acceptance Criteria (which includes Materials Compatibility; Environment, Safety, and Occupational Health (ESOH); Chemical Properties; and Performance Characteristics) needed for approval and successful implementation of alternative cleaners. As such, JS3 should have an important role in preparing the DoD for REACH.
- The Joint Group on Pollution Prevention (JG-PP) is a partnership between the Military Services, the National Aeronautics and Space Administration (NASA), and DLA. JG-PP's mission is to reduce or eliminate hazardous materials or processes within acquisition and sustainment communities.
    - The EnviroData Search (EDS) Portal is one of JG-PP's active projects. Its purpose is to "help government web researchers effectively collect and evaluate

emerging global environmental technologies, issues and regulatory information [by identifying key] business decision making trends, issues and facts needed for prudent allocation of scarce funds."[10] Unlike most search engines, EDS improves access to relevant portions of restricted access web resources. Such a tool could also play an important role in defense preparedness for REACH.

Objective 2.6: Enhance communication with industry to identify commercial substitutes or process improvements for significant mission impact chemicals and materials.

Proponents	
Lead:	CMRMD and DPAP through the DoD GPP Working Group
Support:	SERDP/ESTCP
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Estimation of the number of times communication with commercial industry has led to commercial substitutes or process improvements for significant mission impact chemicals and materials
Other Partners (if any):	NAEM, NDIA

Explanation: While DoD has done an excellent job researching substitute products and processes, unless the rate of adoption of qualified alternatives by the DoD Components improves, DoD will not derive full benefit from its large investments in Research and Development (R&D). Many of these alternatives function and fail in ways entirely different from their traditional counterparts, and the DoD Components are understandably skeptical of test and pilot results, especially in significant mission impact applications. Improving the communication of the efficacy of qualified substitute chemicals and processes from industry will enhance their implementation. Likewise, earlier input by the DoD Components via improved statements of need, now known as the Capability Development Documents, will inform and facilitate more coordinated R&D efforts within industry to better meet the DoD's needs.

The DoD Green Procurement Program (GPP) Working Group is co-chaired by CMRMD and Defense Procurement and Acquisition Policy (DPAP). DPAP's role is a consultative one: to help ensure that specific actions proposed under this objective are consistent with fair treatment of all suppliers and do not inadvertently work to the advantage of some suppliers over others.

Industry forums could include venues such as the NAEM (formerly known as the National Association for Environmental Management) Conference, Defense Manufacturing Conference, National Defense Industry Association (NDIA) events, and meetings of professional engineers' societies.

Objective 2.7: Promote and conduct RDT&E to identify substitute chemicals and materials used in significant mission impact applications.

[10] "EnviroData Search Taps the Web's Hidden Sources: New Search Portal Improves Research Speed, Efficiency", *Currents: The Navy's Environmental Magazine,* Spring 2009, www.enviro-navair.navy.mil.

Proponents	
Lead:	SERDP/ESTCP
Support:	CMRMD, DoD Component Laboratories
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Sharing of successes in identifying substitute chemicals and materials used in significant mission impact applications
Other Partners (if any):	NATO, ASIC, ABCANZ

Explanation: In some cases, substitute chemicals and materials used in significant mission impact applications are already available that meet DoD performance requirements. In cases where adequate substitutes are not available, RDT&E work must be done to develop them. This objective would have the added benefit of assisting the DoD Components in the execution of DoD Military Standard 882D, Standard Practice for System Safety.

While this Strategic Plan is not the vehicle to impose requirements, agreements to test and evaluate new substitute products with a shared cost and benefit with commercial industry should be encouraged. These issues are not particular to the DoD and its fuel community. NATO, Air and Space Interoperability Council, ABCANZ (America/Britain/Canada/Australia/New Zealand), and other international organizations should be engaged to reduce cost for any one nation, eliminate duplication of effort, and ensure interoperability of any and all alternative solutions.

More than one replacement for each chemical and material regulated under REACH is expected, depending on the application. DoD will need to make a determination where to concentrate efforts. A great amount of uncertainty, e.g., lack of technical information and exposure/environmental data, is expected to accompany these newly developed chemicals and materials. Not completing this assessment could lead to the adoption of substitutes by DoD that are actually less green than the chemicals and materials currently used by the DoD. Risk assessment for substitute/alternative chemicals should also include Total Ownership Cost required for lifecycle management of new products relative to current products.

GOAL #3: GUARD AGAINST INTERRUPTIONS/DISRUPTIONS IN DOD'S SUPPLY CHAIN FOR CHEMICALS AND MATERIALS OF SIGNIFICANT MISSION IMPACT AS A RESULT OF REACH.

An efficient, effective supply chain is critical to mission success. DoD must develop strategies to ensure the continuity of DoD's supply chain despite implementation of REACH. It is likely that some suppliers will stop producing some chemicals and products important to the mission. Some supplies may not be available at all, due to limitations on manufacturing or transport. Lack of product availability in the EU may be an issue for DoD operations in and around the EU.

Objective 3.1: Develop a plan to address and manage risks for the possibility of chemicals and materials identified as having significant mission impact becoming unavailable.

Proponents	
Lead:	IP
Support:	Defense National Stockpile Center (DNSC), DLA, DoD Component SMEs
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Follow-up to report generated for Objective 1.5
Other Partners (if any):	GSA

Explanation: A back-up plan is needed, in the event that a chemical or material with significant mission impact to the DoD suddenly becomes unavailable due to unforeseen consequences of REACH. The methodology to meet this objective is prescribed by DoD Handbook 5000.60-H, "Assessing Defense Industrial Capabilities," April 1996. DoD 5000.60-H describes the process by which the risks and impacts associated with the loss of a capability are assessed and discusses approaches and actions that could be taken to resolve the problem.

Objective 3.2: Engage the Manufacturing Technology Program when private sector investments and the free-enterprise system response to REACH are not sufficient for the *economical* as well as *timely* delivery of specific materiels required by DoD.

Proponents	
Lead:	DDR&E
Support:	JDMTP
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: Under the direction of the DDR&E, DoDD 4200.15, "Manufacturing Technology (ManTech) Program" established ManTech (September 19, 2002) with the Joint Defense

Manufacturing Technology Panel (JDMTP) comprised of the Services, DLA, and the Missile Defense Agency (MDA), to implement DoD ManTech policy. With a program vision to "realize a responsive, world-class manufacturing capability to affordably meet Warfighters' needs throughout the defense system life cycle" and a program goal to "improve the affordability of DoD systems by transitioning new and improved manufacturing processes for application across the weapon system life cycle," JDMTP's core strategies are well aligned for achieving this objective. Refer to http://www.dodmantech.com for more information.

Objective 3.3: Develop alternative methods of transportation or agreements to ensure the delivery of chemicals and materials having significant mission impacts.

Proponents	
Lead:	EUCOM
Support:	DLA, ER&S, TRANSCOM, DoD Component SMEs for Packaging, Handling, Storage and Transportation (PHS&T)
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: DoD must be able to obtain certain restricted chemicals/materials from non-EU sources and transport them into/through the EU as well as use and dispose of them. Consequently, DoD must establish awareness of the requirement to plan movements in advance of execution. Failure to do so could result in movement delays.

While this is a potential task for EUCOM Deployment & Distribution Operations Center, end-to-end distribution would be reliant on U.S. Transportation Command (TRANSCOM) for coordination. Consequently, the role of TRANSCOM to ensure "timely, customer-focused global mobility in peace and war with efficient, effective and integrated transportation from origin to destination" needs further coordination. Impacts to transportation tenders need to be identified and amended as necessary to ensure transportation services are REACH-compliant and in accordance with DoDI 4715.05-G, "Overseas Environmental Baseline Guidance Document," May 1, 2007.

GOAL #4: FACILITATE AND RESOLVE DEFENSE-EXEMPTION ISSUES IN EUROPE RELATED TO REACH.

REACH implementation will evolve over many years and will require careful monitoring to ensure adequate awareness of potential impacts to DoD and NATO. To date, few EU nations have developed processes for defense exemptions, and obtaining them appears labor intensive. DoD is aware of some discussions by EU allies to explore the creation of consistent processes for the submission and review of defense exemptions, but additional work is needed.

Objective 4.1: Engage EU MS MODs to reinforce requirements for chemicals and materials needed for critical defense mission applications and assure uninterrupted supply chain capability for chemicals and materials that qualify for defense exemptions.

Proponents	
Lead:	EUCOM
Support:	Theater Components, DLA, ER&S, USNATO, USEU
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	GSA, EU Missions (DOS)

Explanation: The position of the DoD is that, for purposes of REACH, it does not import into the EU equipment or supplies when it is providing such items in direct support to its forces stationed in the EU nor when transporting such items through the EU on military transportation. To the extent REACH would apply to DoD activities in the EU, it would only be when DoD purchases an item which needs to be imported into the EU for delivery by the seller. The seller would then have to secure any necessary defense exemption if the item contained chemicals or materials that were regulated by REACH. Because there is no blanket defense exemption under REACH, defense issues are delegated to individual MS. Clarification/ communication of MS interpretation of REACH is needed, and pursuit by EU MS MOD of defense exemptions, as necessary, should be supported.

The efforts, proposals, and events underway in the EU and in individual EU MS with regard to REACH implementation must be tracked. To do so will involve (1) engaging EU MS MODs, (2) supporting EU MS defense exemptions for U.S. Forces mission requirements in Europe, (3) sharing information with the Defence Environmental Network (DEFNET), U.S. Mission to NATO (USNATO), and U.S. Mission to the EU (USEU), (4) seeking agreement with the DoD position from our allies, and (5) monitoring developments in implementation and enforcement.

Following the passage of EU's RoHS, electronic component manufacturers stopped making leaded components. While lead is certainly not a rare commodity, a defense exemption for leaded components would not have had the desired result for DoD, given the worldwide lack of leaded COTS.

Even if a chemical or material is covered by a defense exemption, it could still become unavailable for DoD, as a consequence of REACH.

DoD must be aware that defense exemptions have limited timeframes and do not ensure that the chemical or material will remain available in the global marketplace. Passage of additional regulations could affect REACH's future interpretation and implementation.

GOAL #5: MINIMIZE REACH-DRIVEN NEGATIVE IMPACTS ON FOREIGN MILITARY SALES (FMS) AND SUPPORT OF EQUIPMENT DELIVERED UNDER FMS CONTRACTS.

Under the FMS program, the U.S. government procures defense articles and services on behalf of the foreign customer, such as an EU MS. MS participating in the FMS program must address REACH compliance issues, with regard to their importation of U.S. defense articles in the EU. Since the FMS program helps reduce the per unit cost of U.S. acquisitions, DoD has a vested interest in reducing any potentially negative impacts from REACH on FMS.

Objective 5.1: Seek to accommodate foreign customer requests for REACH-compliant defense articles on a customer-funded basis.

Proponents	
Lead:	Defense Security Cooperation Agency (DSCA)
Support:	Military Departments, DLA
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	DOS

Explanation: FMS customers identifying a requirement for REACH-compliant defense articles may fund analysis of whether the requested articles are compliant and, when they are not, whether compliant alternatives are available and at what cost.

DLA is the secondary support agency to the Military Departments (MILDEPs) for most FMS case support. In this role, FMS support cases are written by the MILDEPs and DLA responds to requisitions that are submitted by the countries through the MILDEP International Logistics Control Offices. The exception to this role involves requests for Excess Defense Articles (EDA). DLA's Defense Reutilization and Marketing Service (DRMS) writes and manages FMS cases for EDA items that are submitted to DRMS by the MILDEPs.

Objective 5.2: Continue to review potential FMS sales with regard to ways in which they might be impacted by REACH.

Proponents	
Lead:	DSCA
Support:	Military Departments, DLA
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: DSCA will review potential FMS sales for possible REACH impacts, e.g., instances in which FMS customers might choose non-U.S. weapons systems because the U.S. systems are not REACH compliant, or in which FMS customers begin to make REACH-compliance a condition of sale. Where necessary, DSCA will amend FMS-related policies and regulations. DLA (DRMS) will assist DSCA in their review of DRMS-managed EDA cases for possible REACH impact.

GOAL #6: ENSURE THAT ACQUISITION STRATEGIES FOR DOD SYSTEMS ADEQUATELY ADDRESS THE MANAGEMENT OF RISKS ASSOCIATED WITH REACH.

REACH will affect the *future* cost and availability of chemicals and materials. DoD PMs must therefore consider early, and systematically, the effects of REACH (both positive and negative) on lifecycle costs. Curtailing system sustainment costs will be particularly difficult; long lead times for major acquisitions, coupled with the evolving nature of REACH will make it harder to accurately predict risks. Criteria to evaluate risks associated with the use of chemicals materials would assist PMs with this task. Risks can be lessened and even avoided with the use of more inherently benign technologies, materials or chemicals in place of known SVHCs. A number of improvements in the acquisition and procurement process would facilitate better risk management.

Objective 6.1: Develop criteria for evaluating the risks associated with the future use of chemicals and materials, including availability and cost changes.

Proponents	
Lead:	CMRMD
Support:	AT&L, DoD Component Acquisition Leads
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Guidance development on what level of uncertainty (i.e., amount of critical information) is acceptable for comparative analysis of chemical risks
Other Partners (if any):	

Explanation: Objectives 1.4 and 2.3 characterize the risks associated with (1) the continued use of a REACH-regulated chemical and (2) the adoption a substitute chemical because of REACH, respectively. This objective seeks to forecast and compare the ramifications of selecting a REACH-regulated or substitute chemical. Developing criteria should ensure faster, easier and yet more accurate results, keeping acquisition costs down.

Standardized and quantifiable criteria, based on an integrated risk management process, are needed to accomplish this objective. The process could be piloted within communities of interest such as the Office of Corrosion Policy and Oversight, in keeping with the Office's mission (www.corrdefense.org), to determine, for example, the feasibility of chrome and non-chrome treatments in certain defense applications.

A similar standardized approach for the assessment of human health and environmental risks associated with candidate chemicals can be found in Objective 7.2.

"A strategy that cannot be implemented or resourced is not a strategy, but rather a critical failure in leadership and management. It is nothing more than a statement of hopes and good intentions without credibility."

H. U. Kaeser
"Abandon Ships: The Costly Illusion of Unaffordable Transformation,"
Center for Strategic and International Studies
August 2008

Objective 6.2: Determine REACH's applicability and effect when developing Key Performance Parameter (KPP) of Reliability, Availability, Maintainability, and Supportability (RAMS).

Proponents	
Lead:	JCIDS Sponsors
Support:	DoD Component Requirements Oversight Councils, L&MR, I&E
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Modification of Materiel KPP and creation of new KSA
Other Partners (if any):	

Explanation: The bulk of the lifecycle costs (> 60%) of a weapon system platform is associated with the sustainment of its design in the operations and support phase. For electronic components, fully 95% of these costs can be locked-in by the completion of the design phase. Figure 4 illustrates such an example[11] in approximation against milestones in defense acquisition. Investments in Reliability, Availability, and Maintainability (RAM) are essential in correcting high suitability failure rates, where "no amount of testing will compensate for deficiencies in RAM program formulation."[12] If a system currently under consideration is expected to use chemicals or materials that are probable targets for REACH regulation, then those lifecycle costs and consequences need to be addressed as early as possible in the design phase to determine whether or not their use is warranted, or if design modifications should be considered instead (e.g., using cadmium-free parts in place of cadmium parts). In other words, assess the impacts (e.g., significance and expense) to Integrated Logistics Support (ILS) chain.

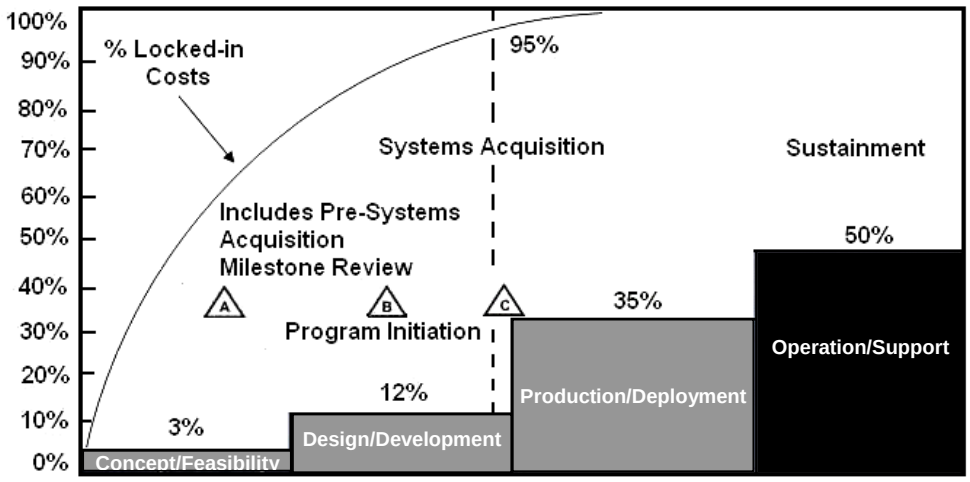


Figure 4. PERCENT OF LIFECYCLE COSTS LOCKED-IN BY PHASES[13] (see also, Figure 3)

[11] *Reliability & Maintainability of Electronic Systems*, J. A. Roberts, J. E. Arsenault, Pitman Publishing, 1980
[12] Defense Science Board Task Force on Director, Operational Test and Evaluation, April 2008
[13] Phase graphics: Robert Cramwell, Sandia National Laboratories, "Ground Vehicle Reliability," DoD Maintenance Symposium, November 13-16, 2007.

In May 2007, Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01F, "Joint Capabilities Integration and Development System," established the materiel availability KPP and Key System Attributes (KSAs) for materiel reliability and ownership costs, also known as the Sustainment KPP, as mandatory Joint Chiefs of Staff metrics. In March of that same year, ASD(L&MR) added 'mean down time,' that is, the average length of time that an asset will not be available due to any reason, as a DoD lifecycle metric. CJCSI3170.01F has since been replaced by CJCSI3170.01G, March 1, 2009.

The Joint Requirements Oversight Council (JROC) supports the acquisition review process by identifying and assessing the priority of joint military requirements to meet the national military strategy, as well as considering alternatives to any acquisition program. Three actions are recommended to the JROC:

- To meet the DoD's most urgent chemical needs that may be impacted by REACH as identified by Objectives 1.4 and 2.3: modify the materiel KPP or create a new KSA that requires impact analysis on new systems for REACH, and present the draft to the JCS for review and issuance
- To prepare the DoD as more chemicals become subject to REACH: incorporate a review and certification check point into the formal Joint Capabilities Integration Development System (JCIDS) process that ensures the item(s) being acquired are done so in strict compliance with established policies and statutes, since some KPPs and KSAs are generated by the Program Sponsor and will vary with each program.
- To emphasize 100% compliance (or a duly justified exception waiver request that is approved by the JROC and the ESOH representative): change contract language such that penalties for non-compliance are enforced, and vendors that are repeat offenders are suspended or barred from doing any further business with DoD.

These actions are in keeping with the current Defense Safety Oversight Council, and the Acquisition and Technology Programs Task Force initiative, to include ESOH offices in the JCIDS document development process, thereby helping to preserve combat capability. An AT&L memorandum to the DoD Components and the Joint Staff to implement the process is in draft.

Objective 6.3: Ensure adequate chemical and material management in the development of Science and Technology (S&T) programs.

Proponents	
Lead:	DDR&E
Support:	CMRMD, AT&L, DoD Component R&D PMs
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: Individual programs develop and prioritize budget plans to obligate RDT&E and identify technology requirements. A review of these programs in total may reveal areas for improvements with regard to overall chemical management and acquisition strategies.

Objective 6.4: Ensure that DoD acquisition policy precludes the use of certain toxic and hazardous chemicals and materials for which there are suitable alternatives.

Proponents	
Lead:	DSPO and DPAP
Support:	CMRMD
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: This objective requires two actions: the first, involving changes to military specifications and standards; and the second, concerning the development of a Defense Federal Acquisition Regulation Supplement (DFARS) clause.

The Defense Standardization Program Office (DSPO) should issue policy to require that all new and revised specifications/standards include a paragraph prohibiting the use of certain chemicals (see Objective 2.1 for further explanation). Many products and services purchased by the DoD, however, are not governed by specifications or standards. Consequently, the development by DPAP of a mandatory DFARS clause for inclusion in all contracts would also be necessary.

Objective 6.5: Determine the need for and, if needed, develop standardized requirements related to DoD contracts for chemicals and materials used in the EU.

Proponents	
Lead:	DPAP
Support:	Contracting Officers, DoD Component Acquisition and Logistics Leads
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: The need for standardized requirements may largely depend on the uniformity of REACH's implementation throughout Europe for military applications. The requirements community needs to monitor REACH-driven additions or changes to statements of work and specifications for DoD contracts, for the purpose of identifying any requirements that become standard or common. If such requirements are identified, DPAP's role would be to assist in developing any standard contract language or guidance for contracting officers.

GOAL #7: CAPITALIZE ON ENVIRONMENT, SAFETY, AND HEALTH (ESH) IMPROVEMENTS IDENTIFIED AS A RESULT OF REACH IMPLEMENTATION.

The aim of REACH is to reduce the use of toxic, bioaccumulative, persistent, and carcinogenic chemicals. Minimizing exposure to hazardous chemicals and materials benefits Service personnel, the civilian population providing military support, and the communities surrounding DoD installations. Numerous examples exist where DoD's adoption of greener, more sustainable materials and products has reduced the costs of compliance to environmental and occupational health laws. DoD can leverage REACH-driven green product substitutions to improve health and safety.

Objective 7.1: Strengthen compliance with existing ESH policies by developing more effective performance metrics and reporting mechanisms.

Proponents	
Lead:	DoD Component ESH SMEs
Support:	SERDP/ESTCP, DoD GPP Working Group (co-chaired by CMRMD and DPAP)
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Identification of policies that require revisions to improve ESH performance, in keeping with the new DoDD/DoDI in Objective 8.3
Other Partners (if any):	

Explanation: The gap analysis conducted under EO 13423 revealed that (1) DoD has many ESH-related chemical policies and programs in place (Appendix D) and (2) issues pertaining to leadership continuity and personnel accountability must be addressed. More effective performance metrics and annual reporting will improve policy compliance and better position DoD for REACH's potential impacts on military readiness.

Accomplishing this objective will have the benefit of further minimizing the exposure of more hazardous chemicals and materials on Soldiers, Sailors, Airmen, Marines, the environment, the civilian population providing military support, and the communities surrounding installations.

Objective 7.2: Develop guidance to ensure that all chemicals and materials considered for use by DoD are assessed for human health and environmental risks.

Proponents	
Lead:	CMRMD
Support:	BEI, DDR&E, DoD Component ESH Organizations
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Development of an entire suite of toxicological criteria
Other Partners (if any):	

Explanation: This objective seeks to minimize unintended consequences in the search for safer and greener alternative chemicals and materials. Additional resources are required for studies to assess human health and environmental impacts, particularly for nanochemicals. Tri-service toxicology labs would be an appropriate ESH organization to support this objective.

The CMRMD is already involved in determining physical, chemical, and toxicity data needs. The CMRMD will research and identify those needs in BEI's Product Hazmat Data (PHD) for assessing risks of chemicals and materials under consideration in DoD acquisition programs.

Prior to permitting vendor products to be included in Authorized Use Lists and Qualified Product Lists for military specifications and other process specifications, proper authorities need to be identified in future versions of this Strategic Plan to ensure and communicate that each Safety Data Sheet (SDS), formerly known as the Material Safety Data Sheet (MSDS), is evaluated for suitability and completeness (especially hazard description and recommended controls).

This objective will also require dialogue with communities of interest (e.g., researchers in nanomaterials) to determine ESH research needs, especially with regard to determining the interval needed to provide *timely* environmental impacts and health effects data on newly developed materials – or an estimation of how long this should take. For chronic disease impacts, it may take years to generate reliable and validated data, although other acute exposure data may be more forthcoming if an ESH research strategy is planned.

Objective 7.3: Continue and expand DoD's use of green chemistry principles in future technologies and alternatives research.

Proponents	
Lead:	SERDP/ESTCP
Support:	CMRMD
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	

Explanation: REACH could substantially contribute to creating a culture of innovation, similar to that observed following the passage of the Montreal Protocol, an international treaty designed to protect the ozone layer by phasing out the production and use of ozone depleting substances (ODSs). Under the Clean Air Act (CAA) and the U.S. EPA's Significant New Alternatives Policy (SNAP) Program in the 1990's, many application-specific alternatives to ODSs were developed and implemented.

CAA and SNAP policies actually contributed to the growth of new and existing U.S. businesses, and many of these companies' products performed better and at lower cost to the military. Conducting outreach to familiarize DoD Component researchers and other communities of interest of the latest developments in green chemistry (e.g., catalysis and solvent-free matrices) would contribute to this culture change.

Objective 7.4: Participate in existing forums to understand original equipment and parts manufacturers concerns and activities about REACH and to communicate DoD interest in continuity and sustainability.

Proponents	
Lead:	CMRMD
Support:	DDR&E (i.e., DoD ManTech Program), ER&S
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Identification of industrial supply chain forums to improve the robustness of DoD's response to REACH
Other Partners (if any):	AIA, ASD

Explanation: Many of this Plan's tasks require close-ties with industry. Aerospace Industries Association of America (AIA) and AeroSpace and Defence Association of Europe (ASD) have already begun collaborating on REACH. Their industrial members have the most to gain (or to lose) as their commercial products become subject to REACH, since this will affect their ability to market their products in Europe. CMRMD should compare its list of suspect target chemicals for REACH with similar efforts underway at AIA and ASD.

Objective 7.5: Develop a prioritized research roadmap with industry to coordinate research efforts and appropriate studies for qualified substitute chemicals and materials.

Proponents	
Lead:	SERDP/ESTCP
Support:	CMRMD
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	<Left blank until meaningful Metric can be identified by Proponents>
Other Partners (if any):	AIA

Explanation: While the communication-related improvements under Goal 2 refer to more traditional research initiatives, this objective emphasizes the unique considerations that REACH-driven research could have on the supply chain.

The recently established Pb- (Lead)-Free Electronics Risk Management (PERM) Program sponsored by AIA's Engineering Management Committee is a continuation of activities formerly conducted by the DoD Executive Lead Free Integrated Process Team (ELF IPT) and the Lead-Free Electronics in Aerospace Project Working Group (LEAP WG). PERM's major advantage over ELF IPT and LEAP WG is its ability to coordinate more focused efforts concerning the DoD's increasing dependence on commercial electronic parts that are lead-free, where doing nothing maximizes the risks to performance. A Task Force has been created to more rapidly address these research needs, with an initial funding commitment by the Navy.

The PERM model could be used to cooperatively address a number of other chemical-specific research needs between industry and DoD.

Objective 7.6: Review current DoD policies to determine if changes or clarifications are needed for more consistent interpretation of, and response to, REACH.

Proponents	
Lead:	CMRMD
Support:	DLA, BEI
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Identification of policies that require revisions to improve the DoD's response to REACH, in keeping with the new DoDI in Objective 8.3
Other Partners (if any):	

Explanation: The explosion of chemical information and discovery in the modern era, along with the complexities and the interdisciplinary nature of the newer chemical sciences has recently led to organizational changes at another Federal agency routinely dealing with these issues. The National Science Foundation is undergoing a re-alignment of its Division of Chemistry Programs.

DoD may be well served to conduct much the same re-appraisal of its chemical management processes for ESH integration at the organizational level. This may lead to fewer, more efficient chemical management strategies and improved ESH results.

GOAL #8: CAPITALIZE ON CHEMICAL MANAGEMENT OPPORTUNITIES IDENTIFIED AS A RESULT OF REACH IMPLEMENTATION.

Reducing the use of toxic and hazardous chemicals and materials requires far improved chemical management practices across the entire supply chain. The implementation of REACH adds urgency to the need for improved governance structures, policies and training to clearly establish expectations and responsibilities, and to coordinate the numerous parties concerned with material selection, use, management, and disposal. DoD can leverage REACH-driven chemical management processes to derive environmental, safety, and health benefits in addition to mission benefits.

Objective 8.1: Evaluate and determine governance to efficiently and effectively oversee implementation of the REACH Strategic Plan.

Proponents	
Lead:	OUSD(AT&L)
Support:	DUSD(I&E), DLA
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Annual oversight of Plan implementation
Other Partners (if any):	GSA

Explanation: No Plan will be successful unless individual programs and their leadership are held accountable for their responsibilities within it. A process needs to be institutionalized to inform appropriate DoD executives of urgent and as yet unmet needs. In October 2009, after this Strategic Plan was drafted, the Emerging Contaminants Governance Council (ECGC) endorsed a CMRMD recommendation to include in the Council's scope the oversight of REACH activities. This Council will be used to track implementation and revision of this Plan.

Objective 8.2: Establish and manage an Integrated Process/Product Team (IPT) for global chemical regulations and management that reports to this governance structure.

Proponents	
Lead:	OUSD(AT&L)
Support:	DUSD(I&E), Director(IP), ASD(L&MR), ASD(A), DDR&E
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Designation of lead
Other Partners (if any):	GSA, United States Trade Representative

Explanation: DoD's IPT structure is successful in the management and communication of ESOH issues to the acquisition community. By using the IPT format as a template, DoD can successfully manage and communicate issues pertaining to REACH.

Execution of this objective will not be possible with leadership solely from the ESOH community. To be successful, this initiative will need to be 'owned' by others at DoD as well.

Objective 8.3: Develop a DoDD or a DoDI for Sustainable Chemical and Material Management.

Proponents	
Lead:	CMRMD
Support:	DoD Component SMEs, BEI, DLA
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Issuance of DoDD/DoDI (first draft, September 2010)
Other Partners (if any):	GSA, NASA

Explanation: Chemical management on a case-by-case basis is both time- and labor-consuming. It would be more efficient and more accurate to manage DoD's chemicals on an enterprise-wide basis. DoD memoranda implementing toxic and hazardous chemical reduction under EO 13423 have already referenced such a need, and the agency-level toxic and hazardous chemical reduction plan submitted to the Office of the Federal Environmental Executive in January 2008 forms the basis for lifecycle assessment throughout the acquisition process.

To accomplish integrated enterprise-wide chemical and material management, overcome institutional stovepipes, and reduce duplication, ESOH considerations must be more routinely included earlier in the acquisition process, i.e., pre-milestone B in Figure 4. This will position the DoD on a more sustainable path towards better informed decisions and continuous improvement with regard to the chemical selection process.

Existing DoD organizations that share the responsibility of chemical management are 'stovepiped' into supply chain, environment, safety, and occupational health, for example. This is not optimal for effective chemical management.

Goal 8 advances the integration of best management practices and the dissemination of new technology by elevating policies, procedures, and resource management to OSD.

In June 2009, the DoD Sustainable Chemical and Material Management Workshop laid the foundation for development of this DoDD/DoDI and improvements to existing policy. The Workshop was well received, with over 50 SMEs in attendance from across the Army, Marines Corps, Navy, Air Force, DLA, and MDA. Attendees offered DoD Component-specific comments and suggestions for this new DoDD/DoDI.

Objective 8.4: Provide training, especially in the development and use of enhanced IT systems for chemical selection and chemical management.

Proponents	
Lead:	DAU
Support:	BEI, CMRMD
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Enrollment tracking and surveying of attendees' needs being met upon completion of course(s)
Other Partners (if any):	NASA, NIH/SIS/NLM, AIAA

Explanation: The Chemical Management Enterprise Information Integration effort underway in BEI already provides support to this objective for the upgrading of existing infrastructures, including HazMat communications such as MSDSs for defense ESOH professionals. The course in green chemistry best practices being developed by CMRMD, in cooperation with the Defense Acquisition University (DAU) and the Services, also supports this initiative for the professional development of DoD's engineering and acquisition personnel, as does the existing DAU course in GPP. Other tools either in use or being considered by DoD for which training should be provided include: (1) NASA's Materials and Processes Technical Information System (http://maptis.nasa.gov/index.asp) for weapon systems designers, and (2) the Division of Specialized Information Services (SIS), National Library of Medicine's (NLM) information resources at the National Institutes of Health (NIH) for equipment maintainers, in particular, the Toxicology Data Network known as TOXNET (http://toxnet.nlm.nih.gov). The American Institute of Aeronautics and Astronautics (http://www.aiaa.org) is likely to be an excellent partner for developing training, as well as a good source of educational and course materials.

GOAL #9: PREPARE DOD TO RESPOND TO THE DEVELOPMENT OF OTHER INTERNATIONAL, NATIONAL, AND STATE REGULATORY SYSTEMS THAT MAY ALSO AFFECT CHEMICALS AND MATERIALS WITH SIGNIFICANT MISSION IMPACT.

REACH was conceived and adopted because of growing public concern over public health and the environment. Biomonitoring has revealed the widespread presence of persistent chemicals in the environment and in humans. Although the EU is the first to implement such sweeping legislation, increased scrutiny of hazardous chemicals and materials is to be expected elsewhere. For example, in the United States, California's Green Chemistry Initiative may be considered a derivative of REACH. DoD needs to track REACH and other laws with the potential to change chemical formulations, product availability, costs, access, and use.

Objective 9.1: Sustain this Strategic Plan as a living document by periodically reviewing current related policies, and updating goals and objectives as necessary.

Proponents	
Lead:	OUSD(AT&L)
Support:	CMRMD, EUCOM JS/J-4
Funding	
☐	Can be accomplished with existing staff / resources
☒	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Revisit Plan's implementation to ascertain if goals and objectives are being met to protect DoD's chemical and material interests
Other Partners (if any):	

Explanation: Given the current economic crisis and the down-sizing of the chemical industry worldwide, including Europe, it is difficult to predict which chemicals the EU will focus on regulating first. CMRMD will subscribe to ECHA's mailing list for newsletters, and monitor ChemicalWatch, a news organization focused on compliance with REACH and other chemicals legislation. As with any new field (e.g., nanotechnology), quarterly meetings may be the most efficient and economical way to keep DoD communities of interest informed and to update the Plan. To that end, in October 2009, the ECGC agreed that the ad hoc EU REACH WG should report to the ECGC as a standing WG.

Currently, EUCOM is not aware of a coordinated EUCOM effort to address REACH and associated issues. EUCOM recommends a cross-staff effort to address, in particular, the items specifically assigned to EUCOM. Additional resources will be required to properly handle these responsibilities, so a coordinated effort will be needed to address these resource requirements as well as staff roles and responsibilities.

Objective 9.2: Continue to monitor U.S. chemical management systems, including changes to OSHA Permissible Exposure Limits, Threshold Limit Values, proposed TSCA and OSHA Hazard Communication reforms, and state initiatives.

Proponents	
Lead:	CMRMD
Support:	DoD Component SMEs, RECs
Funding	
☒	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☐	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Recommendations to improve REC communications
Other Partners (if any):	

Explanation: Enhancing the CMRMD 'scan/watch/action' process (Objectives 1.2, 1.3, and 1.4) as previously described, and using existing mechanisms to solicit DoD Component input as these programs and laws evolve, will help to inform DoD to respond to these changes.

DoD established Regional Environmental Coordinators (RECs) for each of the 10 U.S. EPA Regions in 1994. Each Service designates component RECs for each of the 10 regions. Because RECs' responsibilities include addressing new regional and state environmental regulations, RECs should be kept informed about REACH due to (1) REACH-like initiatives developing within the states and (2) the global nature of the supply chain's potential impacts on defense domestic activities, including training capabilities. Future versions of the Plan should identify a specific parallel conduit for monitoring occupational health issues (as opposed to environmental issues) in keeping with other OSHA-related objectives previously mentioned.

Objective 9.3: Monitor other foreign chemical management and regulatory systems (for instance, the Chinese and Korean versions of RoHS).

Proponents	
Lead:	CMRMD
Support:	DoD Component ESH Organizations
Funding	
☐	Can be accomplished with existing staff / resources
☐	Can be accomplished with funding adjustments / reprioritization
☒	Requires some additional resources by cognizant fiscal management office
☐	Requires significant additional resources – POM issue
☐	Funding requirements not estimated
Metric:	Data mining of pertinent resources to obtain and share the latest information
Other Partners (if any):	

Explanation: This objective seeks to provide global oversight of other areas such as Korea and China that might restrict access to critical chemicals and materials. CMRMD will share relevant information to prepare DoD Components likely to be impacted.

DoD has a number of efforts currently underway addressing related issues, e.g., the Army Environmental Policy Institute, and the Navy's monthly newsletters that the CMRMD can monitor.

A summary of DoD's Strategic Plan for REACH can be found in Table 2.

GOALS	PROPOSED DELIVERABLES	PROPONENTS[1]	EST. COSTS	TIME-SCALE[2]
1. Protect the availability of mission-significant chemicals	Determination of the changes required to BEA to capture and consolidate data; enhanced 'scan/watch/action' process to identify chemical/material risks, locations, usages, and suppliers	BEI	*3.0M	Immediate need
		CMRMD	0.9M	
		Acq & Log[3] Leads		
		IP		
2. Ensure the performance of substitutes	Establishment of where/how substitutes are used and the characterization of their risks; incentivization, adoption, and communication of qualified alternatives; QC product inspections prior to shipment to DoD Components; research into additional alternative materials and processes	DCMA & DLA		Immediate need
		L&MR		
		PMs		
		Acq & Log Leads		
		OUSD(AT&L)		
		DoD GPP WG		
		SERDP/ESTCP		
3. Guard against disruptions to the supply chain	Back-up plan for when certain materials may become unavailable; alternative transportation methods; the means to notify ManTech of unresolved problems	IP		Immediate need
		DDR&E		
		EUCOM		
4. Facilitate defense exemptions	Strategy for an interagency effort, including the European Union's MS Ministries of Defense and the countries in the Area of Responsibility to support any proposed defense exemptions on a case-by-case basis	EUCOM		Mid-term need
5. Minimize negative impacts to Foreign Military Sales (FMS)	Continual accommodation of customer-funded requests for REACH-compliant products, while meeting U.S. commitments under FMS agreements	DSCA		Mid-term need
6. Assure acquisition strategies	Consideration of KPP, KSAs in JCIDS; changes to mil specs, standards, DFARS, and contract language; impact assessment to ILS; development of criteria to assess future chemical risks; deliberation of chemical management in S&T programs; precluding certain toxics in acq policy	CMRMD		Immediate need
		JCIDS Sponsors		
		DDR&E		
		DSPO & DPAP		
7. Capitalize on Environment, Safety, and Health (ESH) opportunities	Strengthening of existing ESH policies; guidance for assessing human health and environmental risks; application of green chemistry principles; industry forum participation for a mutually-prioritized research roadmap; consistency of policy integration	Component SMEs		Mid-term need
		CMRMD	0.06M	
		SERDP/ESTCP		
8. Capitalize on chemical management opportunities	Establishment of REACH governance structure through DoD IPT for global chemicals; development of a DoDD/I for sustainable chemical and material management training in the development and use of IT systems for chemical management	OUSD(AT&L)		Immediate need
		CMRMD		
		DAU		
9. Plan for future regulations	Continuous improvement of this Strategic Plan and the monitoring of proposed U.S. and foreign chemical and material management systems	OUSD(AT&L)		Long-range need
		CMRMD	0.03M	
.**CURRENT TOTAL:**			**3.99M**	

[1]Lead DoD offices only. [2]Timescale based on a comparison of nearest-term objectives among goals. [3]Acquisition and Logistics. *DoD Components will incur costs as well.

Table 2. SUMMARY OF DOD STRATEGIC PLAN FOR REACH (Refer to Appendix F for responsibilities by organization)

ISSUES OF EVOLVING CONCERN FOR REACH

Two issues will require additional attention from DoD with regard to the consequences of REACH's future regulatory scope, and potential impacts to DoD's product development and supply chains. These are nanomaterials and counterfeit products.

REACH AND NANOMATERIALS

DoD invests more in the development of nanomaterials than any other Federal agency. This is because of the unique properties that these materials exhibit for both warfighter protection and armament. In 2006, DoD established the Nanomaterials ESOH Work Group, co-chaired by CMRMD and DDR&E leadership, as the coordinating body for nanomaterials-related ESOH technical, policy and legal information. The Work Group helps promote risk management measures to ensure well-reasoned, evidence-based DoD initiatives and positions. The WG was instrumental in issuing memoranda for the safe handling of nanomaterials, and is well-suited to address upcoming issues concerning REACH and DoD's research and use of nanomaterials worldwide.

To date, the ESH risks to nanomaterials are not very well understood, so it is not surprising that the EU intends to regulate these products under REACH. The EU has expressed the view that REACH requirements apply to nanomaterials, even though there are no specific provisions for nanomaterials and that the application of REACH to nanomaterials as described in the document is without prejudice to any future amendments to REACH.

The scope of nanomaterials under REACH includes both agglomerates and aggregates below and at the micron size, since safety has to be ensured for the substance in whatever size and form and for manufacturing and all identified uses. A REACH registrant has to include all relevant information on the nanomaterial, such as specific properties of nanomaterials not addressed in the REACH Annexes, in order to demonstrate that risks are controlled. This may include different classification and labeling of the nanoform (as compared to the bulk form) and additional risk management measures. These risk management measures and operational conditions (i.e., exposure scenarios) will have to be communicated to the supply chain. This will likely require changes to SDSs, the European equivalent of MSDSs, such that either a separate SDS will be required for a nanomaterial, or, if a nanomaterial also exists in bulk form, the existing SDS must include information on the nanoform's (1) composition and properties, (2) handling and storage, and (3) exposure controls. Visit http://ec.europa.eu/environment/chemicals/reach/pdf/nanomaterials.pdf for further details.

REACH AND COUNTERFEIT PRODUCTS

While ongoing efforts by DoD dealing with counterfeit products were previously mentioned (Objective 2.1), the extent of this problem may be exacerbated as the REACH paradigm becomes more imbedded in European culture. That is, just as occurred after the passage of the Montreal Protocol banning ODSs internationally, the growth of black markets is a distinct possibility for chemicals and materials restricted under REACH.

Counterfeits that may be expected to occur expressly because of REACH include:

- Products falsely labeled as REACH-compliant; and
- Products falsely labeled as original formula.

This is in addition to the high vulnerability of electronic supplies to counterfeiting that already exists, which, if undetected, can cause the malfunction and failure of defense systems.

In July 2008, Naval Air Systems Command (NAVAIR) requested the Department of Commerce (DOC) Bureau of Industry and Security (BIS) to assess the scope and impact of counterfeit electronics on U.S. supply chain integrity, defense readiness, and industrial capabilities.[14] The first such comprehensive study of its kind, BIS found *7,383 electronics counterfeit incidents in 2008, up from 5,747 incidents reported in 2007*. Preliminary analysis concluded that the preponderance of electronic counterfeits found in avionic systems originated from China and other Asian nations. The majority of counterfeits were discovered only after they were returned as defective.[15] Types of counterfeits identified thus far include:

- Low-grade fakes (not made for high temperature or extreme conditions);
- Previously used microcircuits that were re-marked as being higher grade;
- Used microcircuits that were being sold as new;
- Fake, non-working original component products; and
- Working copies of original designs.

[14] Under the Defense Production Act of 1950, and EO 12656, DOC BIS is authorized to survey and assess the financial health and economic competitiveness of U.S. industries that support defense capabilities and requirements.
[15] www.bis.doc.gov/news/2008/bis_press07082008.htm.

COOPERATION, PARTICIPATION, AND ACKNOWLEDGEMENTS

DoD participants in the development of this Strategic Plan are listed below and are expected to expand over time. Their specific roles and responsibilities can be found in Appendices E and F.

Departmental Cooperation

Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L))
- Director, Defense Procurement and Acquisition Policy (DPAP)
- Assistant Secretary of Defense for Acquisition (ASD(A))
  - Director, Industrial Policy (IP)
- Director, Defense Research and Engineering (DDR&E)
  - Strategic Environmental Research and Development Program (SERDP)
  - Defense Standardization Program Office (DSPO)
- Assistant Secretary of Defense for Logistics & Materiel Readiness (ASD(L&MR))
  - Assistant Deputy Under Secretary of Defense, Supply Chain Integration (ADUSD(SCI))
  - Director, Defense Logistics Agency (DLA)
- Deputy Under Secretary of Defense for Installations and Environment (DUSD(I&E))
  - Business Enterprise Integration (BEI)
  - Chemical and Material Risk Management Directorate (CMRMD)
  - Environmental Readiness and Safety (ER&S)
  - Environmental Security Technology Certification Program (ESTCP)

Under Secretary of Defense for Policy (USD(P))
- Director, Defense Security Cooperation Agency (DSCA)

Office of the General Counsel (OGC)

Military Services
- Army, Marine Corps, Navy, and Air Force

Combatant Command
- European Command (EUCOM)

The following Federal organizations' and industrial partners' roles with REACH may have an impact in the implementation of any DoD Strategic Plan for REACH. Communication of this Plan's elements to these organizations should be sought soon after approval by DoD.

Interdepartmental Stakeholders
- Department of Commerce (DOC)
- Department of State (DOS)
- General Services Administration (GSA)
- National Aeronautics and Space Administration (NASA)
- National Institute for Occupational Safety and Health (NIOSH)
- National Institutes of Health, Division of Specialized Information Services, National Library of Medicine (NIH/SIS/NLM)
- Occupational Health and Safety Administration (OSHA)
- United States Trade Representative (USTR)

Industrial Partners
- Aerospace and Defence Industries Association of Europe (ASD)
- Aerospace Industries Association of America (AIA)

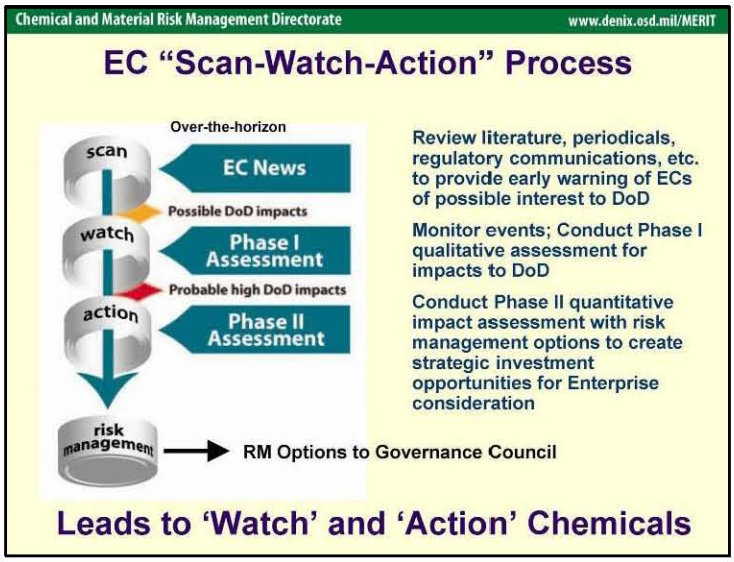
Other stakeholder agencies and industrial partners may be identified in future versions of the Plan. The CMRMD would like to thank the many contributors to this Strategic Plan. For additional copies, please contact Dr. Carole LeBlanc, (703) 604-1934 or Carole.LeBlanc@osd.mil.

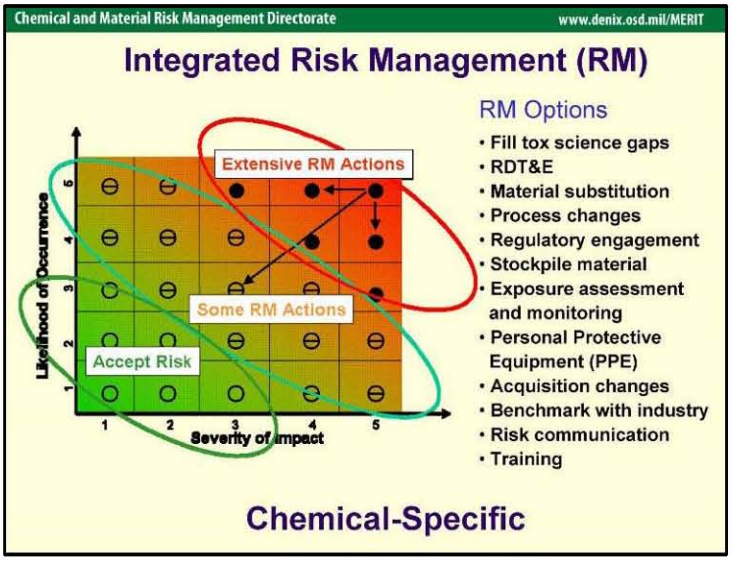
APPENDICES

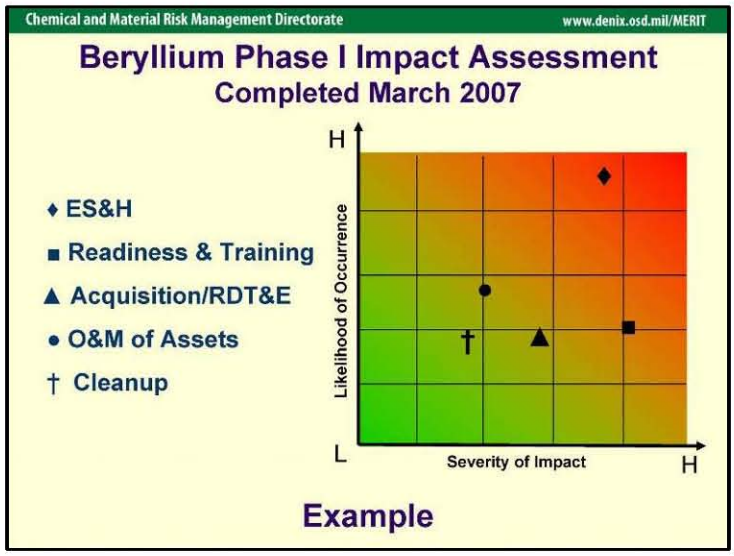
APPENDIX A. REACH RESOURCES

Homepage	http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm
Legislation	http://ec.europa.eu/environment/chemicals/reach/legislation_en.htm Annex XVII, as amended, contains the list of chemicals restricted under REACH
Directive	http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:136:0281:0282:EN:PDF
DEFNET	www.eudefnet.com
UK DEFRA	United Kingdom Department for Environment, Food and Rural Affairs http://www.defra.gov.uk 37-page document, *"Consultation on the enforcement of REACH in the UK"*, June 2008
UK MOD	www.mod.uk/NR/rdonlyres/806A5B3E-8CE7-4C6B-90F6-8176A9EF38BA/0/REACHMODProcess.pdf 37-page report, *"MoD REACH Process Guidance Document"*, May 2008
Other Relevant Chemical Lists:	
SIN List	Substitute It Now List www.sinlist.org
Trade Union Priority List	www.etuc.org

APPENDIX B. CHEMICAL SCAN/WATCH/ACTION PROCESS AND THE IDENTIFICATION OF RISK MANAGEMENT OPTIONS







APPENDIX C. SNAPSHOT IN TIME (AUGUST 28, 2008): THE FIRST CHEMICALS IDENTIFIED AS SVHCS[1] FOR REACH

According to DLA's Hazardous Materials Information Resource System (HMIRS), several of these chemicals (shaded grey) are used by DoD. Revisions of REACH, including the list of SVHCs (Article XVII) are posted at http://ec.europa.eu/environment/chemicals/reach/legislation_en.htm.

Substance	CAS[2] Number	EC[3] Number	Type of Risk	Information Compiled by CMRMD Scanning Process
1. Anthracene	120-12-7	204-371-1	PBT[4]	Used in the manufacture of pyrotechnics and as a component of black smoke. May be of concern since it is used in dyes (flares and markers). **HMIRS[5] – 37 products; MIDAS[6] – 32 items**
2. 4,4'-Diaminodiphenylmethane	101-77-9	202-974-4	CMR[7]	Used as a hardener in epoxy resins and adhesives as well as in some construction coatings Could become a big issue as DoD uses many adhesives (chemistry to be identified) **HMIRS – 253 products, curing and hardening agents, adhesive film**
3. Dibutyl phthalate (DBP)	84-74-2	201-557-4	CMR	Largest general use of DBP is as a plasticizer in resins and polymers such as polyvinyl chloride and in some gun propellants. DBP is also used in printing inks, adhesives, sealants/grouting agents, nitrocellulose paints, film coatings, and glass fibers.
4. Cyclododecane	294-62-2	206-33-9	PBT	Used as an intermediate in a number of contexts, including: (i) as a flame retardant, (ii) in the production of chemicals which are used to make polyamides, polyesters, synthetic lubricating oils, nylon, and high-purity solvents, (iii) in perfume composition as perfume exalting, and (iv) in cleaning and washing agents. It is also used as a raw substance as a binding media for the temporary sealing, consolidation, and conservation of weak or friable materials in the field of excavation and transport of archeological objects. In this context, it has further applications as a facing adhesive, release agent, and consolidant for old paints, papers, and textiles. No items in MIDAS or HMIRS.
5. Cobalt dichloride	7646-79-9	231-589-4	CMR	Widespread uses include the production of gas masks, self indicating silica gels, flux for magnesium refining (notably when recycling scrap material), as a solid lubricant, a metal drier in air-drying coatings, a drying agent in paints, lacquers, varnishes, and printing inks, and in the production of non-ferrous metals and electroplating processes **HMIRS – 215 products; MIDAS – 113 items**
6. Diarsenic pentaoxide	1303-28-2	215-116-9	CMR	Used: (i) in the dying industry, (ii) in metallurgy (to harden copper, lead, or gold in alloys), and (iii) for manufacturing certain types of glass. **HMIRS – 27 products, all pressure treated wood**
7. Diarsenic trioxide	1327-53-3	215-481-4	CMR	Used: (i) as a decolorizing agent for glass and enamels, (ii) as a refining and oxidizing agent for manufacturing special glass and lead crystal formulations, (iii) as a hydrogen recombination poison for metallurgical studies, (iv) as a starting point for the preparation of elemental arsenic, arsenic alloys, and arsenide semiconductors, and (v) as a cytostatic in the treatment of the refractory promyelocytic (M3) subtype of acute myeloid leukemia. It is also used as a wood preservative (when imported from outside of the EU).
8. Sodium dichromate	7789-12-0		CMR	Large potential impact since it is used in many conversion coatings and primers for repaint of all DoD aircraft skins, although less than first suspected on F-16s; much will depend on which products have been qualified. May also be used in chromate washes prior to vehicle painting. In many formulations, zinc chromate, barium chromate, strontium chromate, or other chromates can be used instead. <**Sodium dichromate dihydrate** was screened in 2007 because it showed up on a National Toxicology Program list. There were **57 items in HMIRS;** most were reagent grade for lab use and a number of photo developer cleaning applications.>

Substance	CAS[1] Number	EC[2] Number	Type of Risk	Information Compiled by CMRMD Scanning Process
9. 5-tert-butyl-2,4,6-trinitro-m-xylene (musk xylene)	81-15-2	201-329-4	vPvB[8]	The imported crystalline solid (obtained from China) is used as an ingredient in fragrance compositions. Musk xylene is used in cosmetic products, detergents, fabric softeners, household cleaning products, and in other fragranced products. DoD: No items in MIDAS or HMIRS.
10. Bis (2-ethyl(hexyl)phthalate) (DEHP)	117-81-7	204-211-0	CMR	DEHP is widely used as a plasticizer in polymer products, mainly in PVC. Flexible PVC is used in many different articles (e.g., in toys), in building material such as flooring, cables, profiles, and roofs, and in medical products (including blood bags and dialysis equipment).
11. Hexabromocyclododecane (HBCDD)	25637-99-4	247-148-4	PBT	Widely used on its own or in conjunction with other flame retardants, mainly in polystyrene products but also in some textiles. **HMIRS – extruded polystyrene and styrofoam**
12. Alkanes, C10-13 (Short Chain Chlorinated Paraffins or SCCPs)	85535-84-8	287-476-5	PBT	SCCPs were widely used a decade ago as metal working lubricants and as a leather liquor. These two applications were restricted under EU legislation in 2002. Use in the EU has declined sharply and the main remaining applications are thought to be as flame retardants in textiles and rubber, and in paints, sealants, and adhesives. Only entry not screened; scanning process geared to single chemical rather than broad class of chemicals.
13. Bis(tributyltin)oxide	56-35-9	200-268-0	PBT	Main industrial use registered for TBTO in the last few years is the manufacture of transportation equipment, namely in the building and repairing of ships and pleasure and sporting boats. High amounts of TBTO have also been used in the past for manufacture of chemicals and chemical products.
15. Triethyl arsenate	15606-95-8	427-700-2	CMR	See the comments in relation to lead hydrogen arsenate, above. DoD: No items in MIDAS or HMIRS.
16. Benzyl butyl phthalate	85-68-7	201-622-7	CMR	Main current use of BBP is as a softener (i.e., a plasticizer) in PVC products, with flooring as the largest single-use category. BBP is also used with other polymers in, e.g., sealants, adhesives, paints, inks, and lacquers.
Other Substances of Immediate Global Regulatory Concern				
Cadmium (Cd)–containing products				EU restrictions on Cd use for vehicles come into effect **June 1, 2009** (aircraft exempted for now); includes fasteners and bolts. DoD may not be able to obtain Cd-plated components; major impacts to repair and overhaul can be expected for trucks, for example, since few qualified alternatives (ZnNi plate, Al coatings), especially for fasteners.
Asbestos				Used for some turbine engine washers, gaskets. Existing items can be used, but not replaced, with asbestos.

Known DoD Chemicals of Interest Determined Thus Far

[1]SVHC = Substance of Very High Concern.
[2]CAS = Chemical Abstracts Service.
[3]EC = Term replaces outmoded European Inventory of Existing Commercial Substances (EINECS) designation.
[4]CMR = Carcinogenic, Mutagenic or Reproductive Toxin.
[5]HMIRS = Hazardous Materials Information Resource System.
[6]MIDAS = Munitions Items Disposition Action System.
[7]PBT = Persistent Bioaccumulative and Toxic.
[8]vPvB = Very Persistent and Very Bioacccumulative.

APPENDIX D. GAP ANALYSIS FOR AGENCY-LEVEL CHEMICAL MANAGEMENT

DoD Chemical Management Policy Baseline

◆ Programs
▼ Potential Gaps

MS Element \ LC Phase	Acquisition	Operation & Sustainment	Disposal
Policy	◆P2	◆GPP ◆4140.1-R ◆Range Use ◆HAZCOM ◆Energy Mgmt -Fuels ◆Energy Mgmt - Facilities ◆IPM ◆EMS	◆P2 ◆DERP
Planning	▼Demil Strategy ◆EC ◆PESHE ◆LC Cost	◆P2 ◆Sustainable Design ◆Energy Mgmt - Facilities ◆Energy Mgmt -Fuels	
Training	◆DAU ▼GPP Training	◆HAZCOM ▼Log Training	
Operational Control	◆System Safety	◆Corrosion Control ◆DESC ◆P2 ◆Shelf Life ▼Dated TMs ◆IPM ◆DNSC	◆Chem Demil ◆P2 ◆OB/OD ◆DRMS ◆HW Disposal ◆HM Disposal ◆DERP
Metrics: Implmt/ Performance		◆HM Plans ◆Energy Mgmt - Facilities ◆Transport Score ◆Env Score ◆EMS Score ◆P2 Metrics ◆Energy Facilities Score	◆TRI
Audits (Internal/Ext)	◆DCMA	◆EMS Audits ◆ECAMP-TEAM	
Management Review	▼PM ESOH Evaluation	◆EC ◆Environmental Compliance ▼Log Accountability ▼4715.1 MR ◆EM/ER&S	

APPENDIX E. DOD DEPARTMENTAL DESCRIPTIONS AND RESPONSIBILITIES

Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L))

- **Director, Defense Procurement and Acquisition Policy (DPAP)**
  DPAP is responsible for acquisition and procurement policy matters in DoD. DPAP serves as the principal advisor to the USD(AT&L), ASD(A), and the Defense Acquisition Board on acquisition/procurement strategies for all major weapon systems programs, major automated information systems programs, and services acquisition.
- **Assistant Secretary of Defense for Acquisition (ASD(A))**
  - **Director**, **Industrial Policy (IP)**
    The mission of the Director, (IP) is to sustain an environment that ensures the industrial base on which DoD depends is reliable, cost-effective, and sufficient to meet DoD requirements. Specifically, the Director, (IP) is responsible to ensure that DoD policies, procedures, and actions: (1) stimulate and support vigorous competition and innovation in the industrial base supporting defense; and (2) establish and sustain cost-effective industrial and technological capabilities that assure military readiness and superiority.
  - **President, Defense Acquisition University (DAU)**
    DAU's mission is to provide a global learning environment to support a mission-ready Defense Acquisition Workforce that develops, delivers, and sustains effective and affordable warfighting capabilities. Impact acquisition excellence through: acquisition certification and leadership training; mission assistance to acquisition organizations and teams; online knowledge-sharing resources; continuous learning assets; and strategic workforce planning.
  - **Director, Defense Contract Management Agency (DCMA)**
    DCMA is the DoD component that works directly with Defense suppliers to help ensure that DoD, Federal, and allied government supplies and services are delivered on time, at projected cost, and meet all performance requirements. DCMA directly contributes to the military readiness of the U.S. and its allies, and helps preserve the nation's freedom.
- **Director, Defense Research and Engineering (DDR&E)**
  - **Strategic Environmental Research and Development Program (SERDP)**
    SERDP is the DoD's environmental science and technology program, planned and executed in full partnership with the Department of Energy (DoE) and the U.S. Environmental Protection Agency (EPA), with participation by numerous other federal and non-federal organizations. To address the highest priority issues confronting the DoD Components, SERDP focuses on cross-service requirements and pursues high-risk/high-payoff solutions to the Department's most intractable environmental problems. The development and application of innovative environmental technologies support the long-term sustainability of DoD's training and testing ranges as well as significantly reduce current and future environmental liabilities.
  - **Defense Standardization Program Office (DSPO)**
    DSPO champions standardization throughout DoD to reduce costs and improve operational effectiveness. The office identifies, influences, develops, manages, and provides access to standardization processes, products, and services for warfighters, the acquisition community, and the logistics community to promote interoperability, reduce total ownership costs, and sustain readiness.
- **Assistant Secretary of Defense for Logistics & Materiel Readiness (ASD(L&MR))**
  - **Assistant Deputy Under Secretary of Defense, Supply Chain Integration (ADUSD(SCI))**
    The mission of SCI is advancing the integration of the DoD supply chain through policy development and by facilitating DoD Component implementation of supply chain management practices; coordinating DoD Components' logistics strategies to provide a unified approach to supporting the DoD's logistics missions, goals and objectives; examining promising concepts for logistics management and assessing their applicability to the DoD; and strengthening the professional development of logisticians.

- **Director, Defense Logistics Agency (DLA)**
  The DLA supplies the DoD Components and several civilian agencies with the critical resources they need to accomplish their worldwide missions. DLA provides wide-ranging logistical support for peacetime and wartime operations, as well as emergency preparedness and humanitarian missions.

- **Deputy Under Secretary of Defense for Installations and Environment (DUSD(I&E))**
  - **Business Enterprise Integration (BEI)**
    The goals of BEI are to enable achievement of I&E strategic and tactical goals and objectives; provide better information for strategic and tactical resourcing decisions; reduce the cost of business operations; improve stewardship of I&E assets; and support integration of DoD enterprise business operations.
  - **Chemical and Material Risk Management Directorate (CMRMD)**
    CMRMD is responsible for identifying and characterizing the risks associated with the selection, procurement, acquisition, use, disposal and demilitarization (that is, throughout the lifecycle) of chemicals and materials of interest to DoD, in order to inform better decision-making.
  - **Environmental Readiness and Safety (ER&S)**
    ER&S is responsible for policy, oversight and advocacy of safety and health programs worldwide and environmental programs of US Forces outside the United States including encroachment and the long term sustainability of the mission.
  - **Environmental Security Technology Certification Program (ESTCP)**
    ESTCP is a DoD program that promotes innovative, cost-effective environmental technologies through demonstration and validation at DoD sites. ESTCP's goal is to demonstrate and validate promising, innovative technologies that target the most urgent environmental needs of DoD. These technologies provide a return on investment through cost savings and improved efficiency. The current cost of environmental remediation and regulatory compliance in the DoD is significant. Innovative technology offers the opportunity to reduce costs and environmental risks. ESTCP offers funding in the following four focus areas: Environmental Restoration, Munitions Management, Sustainable Infrastructure, and Weapons Systems and Platforms.

Under Secretary of Defense for Policy (USD(P))

- **Director, Defense Security Cooperation Agency (DSCA)**
  DSCA fosters security cooperation programs vital to U.S. national security to build trust and influence in peacetime, to have access to regions of the world during times of crisis, and to ensure interoperability with coalition partners during times of conflict. Security cooperation programs provide for financial and technical assistance; transfer of defense materiel, training and services to friends and allies; and promotion of military-to-military contacts.

Office of the General Counsel (OGC)

OGC is headed by the General Counsel of DoD. The General Counsel is by law the Chief Legal Officer of the DoD. The Office of General Counsel provides advice to the Secretary and Deputy Secretary of Defense regarding all legal matters and services performed within, or involving, DoD. It also provides legal advice to OSD organizations and, as appropriate, other DoD Components. OGC reviewed this document.

Military Services

- Army, Marine Corps, Navy, and Air Force

Combatant Command

- European Command (EUCOM)

APPENDIX F. ROLES & RESPONSIBILITIES FOR PLAN OBJECTIVES BY LEAD DEFENSE ORGANIZATIONS

BEI	1.1 Determine what changes are required to the BEA to address the capture and consolidation of data for chemicals and materials identified as having significant mission impacts, and modify business systems.
CMRMD	1.2 Expand the current CMRMD chemical 'scanning' process to include the identification of potential targets of REACH regulation that are of interest to DoD.
	1.4 Characterize the risks associated with the use of the chemicals and materials so identified to determine if action is necessary.
	6.1 Develop criteria for evaluating the risks associated with the future use of chemicals and materials, including availability and cost changes.
	7.2 Develop guidance to ensure that all chemicals and materials considered for use by DoD are assessed for human health and environmental risks.
	7.4 Participate in existing forums to understand original equipment and parts manufacturers concerns and activities about REACH and to communicate DoD interest in continuity and sustainability.
	7.6 Review current DoD policies to determine if changes or clarifications are needed for more consistent interpretation of, and response to, REACH.
	8.3 Develop a DoDD or a DoDI for Sustainable Chemical and Material Management.
	9.2 Continue to monitor U.S. chemical management systems, including changes to OSHA Permissible Exposure Limits, Threshold Limit Values, proposed TSCA and OSHA Hazard Communication reforms, and state initiatives.
	9.3 Monitor other foreign chemical management and regulatory systems (for instance, the Chinese and Korean versions of RoHS).
DAU	8.4 Provide training, especially in the development and use of enhanced IT systems for chemical selection and chemical management.
DCMA/DLA	2.1 Establish where and how these substitute chemicals and materials are, or may be, used.
DDR&E	3.2 Engage the Manufacturing Technology Program when private sector investments and the free-enterprise system response to REACH are not sufficient for the economical as well as timely delivery of specific materiels required by DoD.
	6.3 Ensure adequate chemical and material management in the development of S&T programs.
DLA/IP	1.5 Identify suppliers of chemicals and materials with significant mission impact to (a) gauge their continued availability and (b) understand the market trends that influence their availability, to secure their supply.
DLA/DCMA	2.1 Establish where and how these substitute chemicals and materials are, or may be, used.
DLA/LM&R	2.2 Assess the impacts from the use of these substitute chemicals and materials to determine if actions are necessary.
DPAP	6.5 Determine the need for and, if needed, develop standardized requirements related to DoD contracts for chemicals and materials used in the EU.
DPAP/DSPO	6.4 Ensure that DoD acquisition policy precludes the use of certain toxic and hazardous chemicals and materials for which there are suitable alternatives.
DSCA	5.1 Seek to accommodate foreign customer requests for REACH-compliant defense articles on a customer-funded basis.
	5.2 Continue to review potential FMS sales with regard to ways in which they might be impacted by REACH.
DSPO/DPAP	6.4 Ensure that DoD acquisition policy precludes the use of certain toxic and hazardous chemicals and materials for which there are suitable alternatives.
EUCOM	3.3 Develop alternative methods of transportation or agreements to ensure the delivery of chemicals and materials having significant mission impacts.
	4.1 Engage EU MS MODs to reinforce requirements for chemicals and materials needed for critical defense mission applications and assure uninterrupted supply chain capability for chemicals and materials that qualify for defense exemptions.
IP	3.1 Develop a plan to address and manage risks for the possibility of chemicals and materials identified as having significant mission impact becoming unavailable.
IP/DLA	1.5 Identify suppliers of chemicals and materials with significant mission impact to (a) gauge their continued availability and (b) understand the market trends that influence their availability, to secure their supply.
LM&R/DLA	2.2 Assess the impacts from the use of these substitute chemicals and materials to determine if actions are necessary.
OUSD(AT&L)	2.5 Ensure the adoption of substitute chemicals and materials having already met acquisition performance criteria.
	8.1 Evaluate and determine governance to efficiently and effectively oversee implementation of this Plan.
	8.2 Establish and manage an IPT for global chemical regulations and management that reports to this governance structure.
	9.1 Sustain this Strategic Plan as a living document by periodically reviewing current related policies, and updating goals and objectives as necessary.
SERDP / ESTCP	2.7 Promote and conduct RDT&E to identify substitute chemicals and materials used in significant mission impact applications.
	7.3 Continue and expand DoD's use of green chemistry principles in future technologies and alternatives research.
	7.5 Develop a prioritized research roadmap with industry to coordinate research efforts and appropriate studies for qualified substitute chemicals and materials.
Interdepartmental	
Acq & Log SMEs	2.4 Develop incentives in order to evaluate and implement chemical and material substitutes.
	1.3 Establish the extent and significance of the specific uses of the chemicals and materials identified in Objective 1.2, including geographic locations, as part of the ongoing CMRMD chemical 'watch' process.
ESH SMEs	7.1 Strengthen compliance with existing ESH policies by developing more effective performance metrics and reporting mechanisms.
GPP WG	2.6 Enhance communication with industry to identify commercial substitutes or process improvements for significant mission impact chemicals and materials.
$JCIDS_{Sponsors}$	6.2 Determine REACH's applicability and effect when developing KPP of RAMS.
PMs	2.3 Characterize the risks associated with the use of these substitute chemicals and materials to determine if actions are necessary.

APPENDIX G: ADDENDUM – COMMENTS FOR FURTHER CONSIDERATION

These four summarized comments, compiled during the coordination process, are presented for consideration as starting points from which DoD should continue planning for REACH.

FMS Transport Concerns

Transportation of FMS takes place in one of three ways:

- Most common is the purchasing country's freight forwarder takes delivery from the manufacturer and delivers the items to the purchaser. In this case, complying with any requirements associated with REACH implementation by countries through which the items transit is the responsibility of the freight forwarder.
- Defense Transportation Service (DTS) Commercial, in which the United States Government (USG) contracts a commercial vendor to deliver the items to the FMS purchaser. In this case, the USG contracting officer would require the shipper to find a route that complies with the REACH implementation requirements of the countries through which any items that fall under REACH restrictions may transit.
- In the least common situation, DTS delivers the items to the FMS purchaser on USG organic transportation assets – U.S. military vessels or aircraft. In these situations, the FMS items are shipped in the same manner as items to be used by the USG. If by air, the Air Mobility Command refers to the Foreign Clearance Guide, which is online and updated constantly based on information provided by U.S. and foreign embassies. Procedures may be established by the International Civil Aviation Authority (ICAO). This provides a consolidated, widely available compilation of all countries' requirements for transit or overflight of hazardous materials. A similar information guide may exist for surface shipments, which are handled by the Surface Deployment Distribution Command.

In summary, there is no dedicated FMS transit system; FMS transport is either commercially run, DoD-run or some combination of the two. In the future development of transportation plans, both commercial and USG shippers may need access to databases that contains current information regarding REACH, and any individual EU MS's policies for the implementation or REACH, as they apply to defense articles.

Industrial Capabilities Concerns

There are many vendor problems that arise in normal program and item management. Usually, these can be resolved employing routine procedures and authorities. DoD managers sometimes need a product or service that cannot be obtained utilizing routine authorities and thus require special action. In these cases, DoD Components conduct their own assessments when there is an indication that industrial or technological capabilities associated with an industrial sector, subsector, or commodity important to a single DoD Component is vulnerable and could be lost; or an assessment is necessary to provide industrial capabilities information to help make specific programmatic decisions.

When industrial capabilities affect more than one defense program or user, the DoD Components are expected to coordinate analyses and subsequent decisions within and across the Components. In the exceptional instance when an industrial capability that affects multiple programs or systems is unavailable or may be lost, a broader industrial capabilities analysis may be required to better understand the problem(s) and identify possible courses of action.

Concerns About Changes to the DSS

System changes to the Distribution Standard System (DSS) may be required as a result of REACH. Any associated resource requirements must be identified and captured in Version 2 of the DoD Strategic Plan for REACH.

SDS Development Concerns

Under Goal 7, a new Objective may be required to revise the process for the development of SDSs in the DoD Hazardous Materials Information Resource System (HMIRS), and enforce chemical manufacturer compliance with REACH requirements when submitting SDSs to DLA via the Service focal points. DoD may want to partner with NIOSH to purse this effort.

APPENDIX H. ACRONYMS

AIA	Aerospace Industries Association of America
ASD	Aerospace and Defence Industries Association of Europe
AT&L	Acquisition, Technology and Logistics
BEA	Business Enterprise Architecture
BEI	Business Enterprise Integration
BIS	Bureau of Industry and Security
CAA	Clean Air Act
CMRMD	Chemical and Material Risk Management Directorate
COCOMs	Combatant Commanders
COTS	Commercial-Off-the-Shelf
DAU	Defense Acquisition University
DCMA	Defense Contract Management Agency
DCMC	Defense Contract Management Command
DDR&E	Director, Defense Research and Engineering
DEFNET	EU Defence Environmental Network
DFARS	Defense Federal Acquisition Regulation Supplement
DLA	Defense Logistics Agency
DOC	Department of Commerce
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOS	Department of State
DNS	Defense National Stockpile
DPAP	Defense Procurement Acquisition Policy
DRMS	Defense Reutilization and Marketing Service
DSCA	Defense Security Cooperation Agency
DSPO	Defense Standardization Program Office
DTS	Defense Transportation Service
DUSD	Deputy Under Secretary of Defense
ECGC	Emerging Contaminants Governance Council
ECHA	European Chemicals Agency
EDA	Excess Defense Articles
EDS	EnviroData Search
ELF IPT	Executive Lead Free Integrated Process Team
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Enterprise Resource Planning
ER&S	Environmental Readiness and Safety
ESH	Environment, Safety, and Health
ESOH	Environment, Safety, and Occupational Health
ESTCP	Environmental Security Technology Certification Program
EU	European Union
EUCOM	European Command
FMS	Foreign Military Sales
GPP	Green Procurement Program
GSA	General Services Administration
HMIRS	Hazardous Materials Information Resource System
IAC	Industrial Analysis Center
I&E	Installations and Environment
ILS	Integrated Logistics Support
IP	Industrial Policy
IPT	Integrated Process/Product Team
IT	Information Technology
JCIDS	Joint Capabilities Integration Development System

JCS	Joint Chiefs of Staff
JDMTP	Joint Defense Manufacturing Technology Panel
JG-PP	Joint Group on Pollution Prevention
JROC	Joint Requirements Oversight Council
JS3	Joint Service Solvent Substitution
KPP	Key Performance Parameter
KSA	Key System Attribute
LEAP WG	Lead-Free Electronics in Aerospace Project Working Group
L&MR	Logistics and Materiel Readiness
ManTech	Manufacturing Technology Program
MDA	Missile Defense Agency
MILDEP	Military Department
MOD	Ministry of Defence
MS	Member States
MSDS	Material Safety Data Sheet
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air Systems Command
NDIA	National Defense Industry Association
NIH	National Institutes of Health
NIOSH	National Institute for Occupational Safety and Health
NLM	National Library of Medicine
ODS	Ozone Depleting Substance
OEM	Original Equipment Manufacturer
OGC	Office of the General Counsel
OSD	Office of the Secretary of Defense
OSHA	Occupational Safety and Health Administration
OUSD	Office of the Under Secretary of Defense
PEO	Program Executive Office
PERM	Pb- or Lead-Free Electronics Risk Management
PHS&T	Packaging, Handling, Storage and Transportation
PM	Program Manager
POM	Program Objective Memorandum
R&D	Research and Development
RAM	Reliability, Availability, and Maintainability
RAMS	Reliability, Availability, Maintainability, and Supportability
RDT&E	Research, Development, Test, and Evaluation
REACH	Registration, Evaluation, Authorisation and Restriction of Chemical Substances
RECs	Regional Environmental Coordinators
RoHS	Restriction of Hazardous Substances
S&T	Science and Technology
SCI	Supply Chain Integration
SDS	Safety Data Sheet (EU equivalent to MSDS)
SERDP	Strategic Environmental Research and Development Program
SIEF	Substance Information Exchange Forum
SIS	(NIH/NLM's) Specialized Information Services
SME	Subject Matter Expert
SNAP	(U.S. EPA's) Significant New Alternatives Policy
SROC	Senior Readiness Oversight Council
SVHC	Substance of Very High Concern
TRANSCOM	U.S. Transportation Command
TSCA	Toxic Substances Control Act
USD	Under Secretary of Defense
USEU	U.S. Mission to EU
USNATO	U.S. Mission to NATO
USG	United States Government