



U.S. Army Research, Development and Engineering Command

*Technology Transition: The  
Dynamic Role of the US Army  
Research Laboratory  
Coatings and Corrosion Offices.*

**ARL**

***TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.***

ASETSDefense 2012

August 28<sup>th</sup>, 2012

Fred Lafferman & John A. Escarsega

[fred.lafferman@mail.mil](mailto:fred.lafferman@mail.mil)

[john.a.escarsega@mail.mil](mailto:john.a.escarsega@mail.mil)

## Report Documentation Page

*Form Approved*  
*OMB No. 0704-0188*

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE <b>28 AUG 2012</b>	2. REPORT TYPE	3. DATES COVERED <b>00-00-2012 to 00-00-2012</b>			
4. TITLE AND SUBTITLE <b>Technology Transition: The Dynamic Role of the US Army Research Laboratory Coatings and Corrosion Offices.</b>		5a. CONTRACT NUMBER			
		5b. GRANT NUMBER			
		5c. PROGRAM ELEMENT NUMBER			
6. AUTHOR(S)		5d. PROJECT NUMBER			
		5e. TASK NUMBER			
		5f. WORK UNIT NUMBER			
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>U. S. Army Research Laboratory, Aberdeen Proving Ground, MD, 21005</b>		8. PERFORMING ORGANIZATION REPORT NUMBER			
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)			
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)			
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES <b>ASETSDefense 2012: Sustainable Surface Engineering for Aerospace and Defense Workshop, August 27-30, 2012, San Diego, CA. Sponsored by SERDP/ESTCP.</b>					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>12</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			



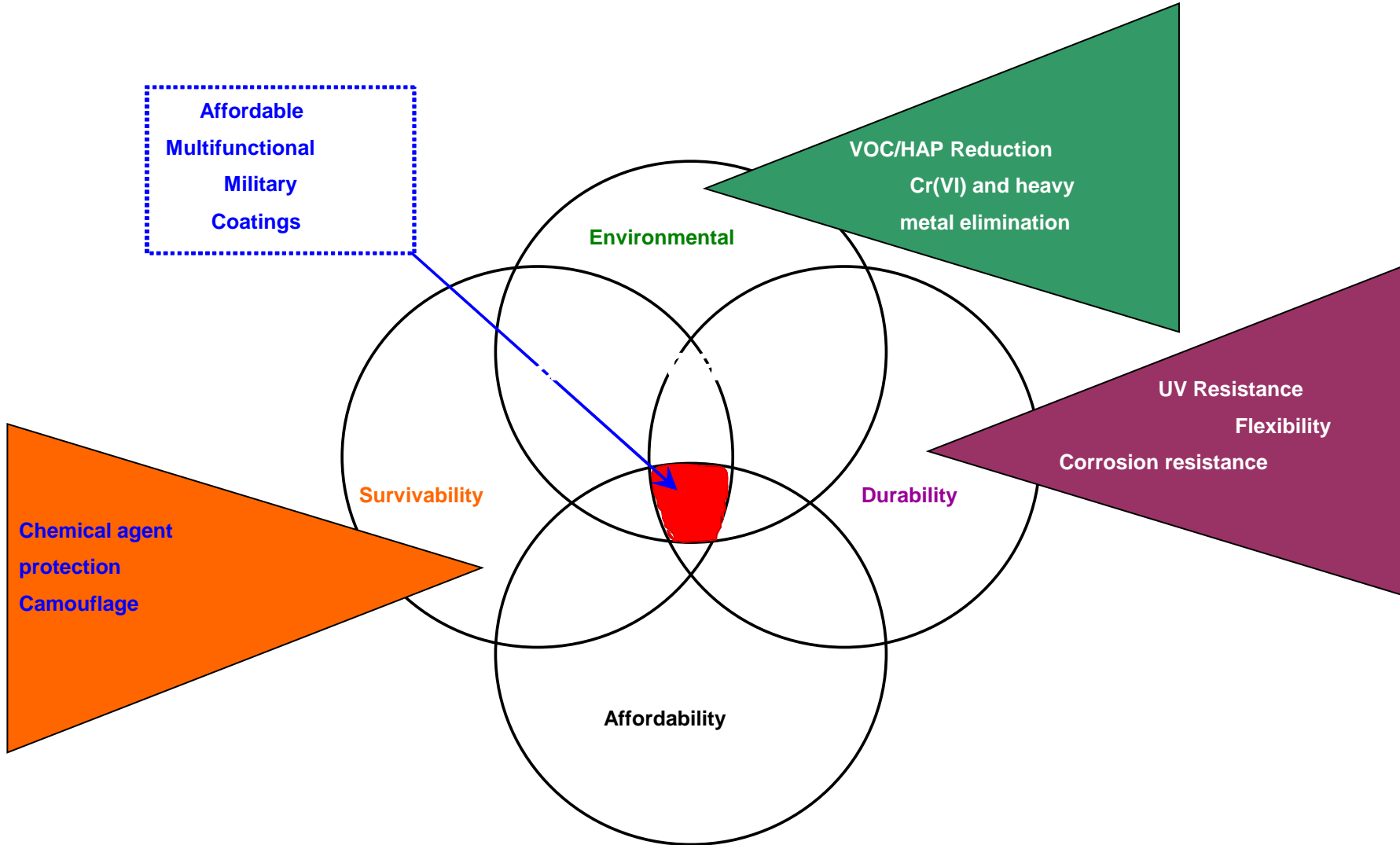
Courtesy of U.S. Army

- ***Technology Transition***
- ***Key Drivers to Support New Technology***
- ***Major Gaps in Pretreatments***
- ***Coatings and Corrosion Updates***
- ***Transition of New Pretreatment Technology***



Courtesy of U.S. DoD





- Transitioning New and Enhanced Technology
  - ❖ Reduction of Hazardous Air Pollutants
  - ❖ Elimination of Heavy Toxic Metals
  - ❖ Reduction of Volatile Organic Compounds
  - ❖ Enhanced Performance-Corrosion and Weathering

- Specifications
  - ❖ Powder Coating-MIL-PRF-32348
  - ❖ E-Coat-MIL-DTL-53084
  - ❖ Enhanced Corrosion-MIL-DTL-53022/MIL-DTL-53030
  - ❖ HAP-free Solvent-Memorandum and NSN's, future MIL-T-81772 type
  - ❖ Crystalline Silica Elimination-CARC Topcoats

- Pretreatment for Ferrous Substrates-TT-C-490 CHEMICAL CONVERSION COATINGS AND PRETREATMENTS FOR FERROUS SURFACES (BASE FOR ORGANIC COATINGS)
  - ❖ Type I-Zinc Phosphate
  - ❖ Type III-Wash Primer conforming to DoD-P-15328
    - Contains hexavalent chromium-7% Zinc Chromate
    - Contains HAPS
    - Contains high levels of VOC-6.7 lbs/gal
    - Only pretreatment for spray application not requiring contained and regulated spray booth
    - Only pretreatment for multi-metal application

- Defense Federal Acquisition Regulation Supplement; Minimizing Use of Hexavalent Chromium (DFARS Case 2009-D004).
- Proposed-52.211-4017 (TACOM) PREPARATION, APPLICATION, AND QUALITY ASSURANCE OF CARC PAINT SYSTEMS
- TACOM- Products containing hexavalent chromium shall not be used
- No available replacement for wash primer for spray application in existing spray booths.
- Direct to metal is not recommended or approved.
- ***Planned action to resolve this gap in technology is revision to TT-C-490.***



- Evaluation and demonstration of Zr pretreatments as alternatives to both Zinc phosphate and chromate conversion coatings- SERDP and ESTCP
- Evaluation of Mg-Rich and Mg-Oxide primers for application to Army aircraft- ESTCP/NAVAIR&AMCOM
- ARL pursuing non-isocyanate topcoat technologies- SERDP

- Cadmium elimination on fasteners-ESTCP
- Evaluation and demonstration of spray in place hexavalent chromium free pretreatments to replace wash primer for multi-metal application-TMR and OSD
- Development of rapid cure CARC Coatings-OSD
- Non-chromate ZVOC pretreatments-ESTCP/Kelley\*

- Major Questions to be Asked:
  - What is the transition method to implement new pretreatment technologies.
  - Transition to Chemical Agent Resistant Coating System.
- ***Planned action to resolve this gap in technology is revision to TT-C-490.***

- Revision to TT-C-490-CHEMICAL CONVERSION COATINGS AND PRETREATMENTS FOR METALLIC SUBSTRATES (BASE FOR ORGANIC COATINGS)
  - ❖ Multi-metal application
  - ❖ Immersion and spray technologies
  - ❖ Organic and inorganic pretreatments
    - ❖ Silanes
    - ❖ Nano-Technology
    - ❖ Zirconium Technology
  - ❖ Qualification of new technologies, cancellation of DoD-P-15328
  - ❖ Legacy systems, as zinc phosphate, will not be affected
  - ❖ Legacy systems-**Does Not Require Qualification**
  - ❖ Referenced in MIL-DTL-53072, CARC application specification

# QUESTIONS?