U.S. Army Research, Development and Engineering Command

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

RDECOM Corrosion Prevention and Control (CPC) Research, Development, Test and Evaluation Strategy

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Unclassified

RDECOM Corrosion and Environmental Programs

RDECOM Environmental Acquisition & Logistics Sustainment Program (EALSP)

Environmental Program

- Mature, robust
- Coordination through AMC/ASA(ALT) Environmental Support Office
- Managed via enduring RDTE BA6 supplied by ASA(I&E) and ACSIM
- Efforts executed at RDECs via:
  - EQBR (BA1)
  - EQT (BA2-BA3)
  - SERDP (BA2-BA3)
  - ESTCP (BA3-BA4)
  - NDCEE (BA4)
  - RN08 MDEP Direct Funding (BA4)
  - VEQT MDEP Direct Funding (BA4, BA6)
  - Congressional and Customer Funding

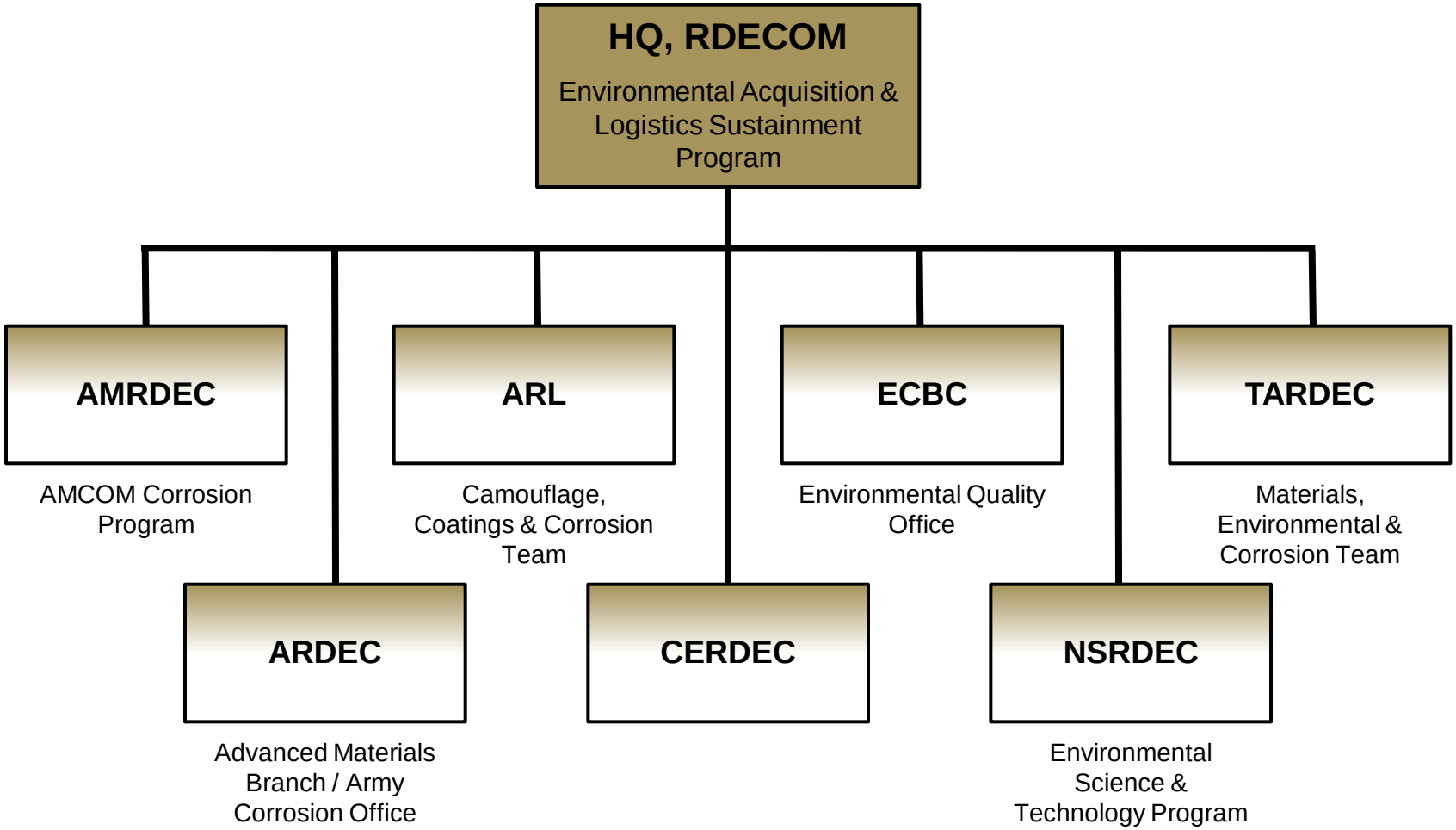
Corrosion Program

- Less mature, largely unfunded
- Coordination through AMC G-4/7/9 and DASA(AP&L)
- Currently managed via unprogrammed OSD and Supplemental funding
- Efforts currently executed via:
  - Limited OSD funding (BA4, O&M)
  - Congressional and Customer Funding
- Need for more robust RDTE program

Leveraging/Integration

Paints Coatings
Plating Pre-treatments
Alloys Composites

Technology Program Development Team



Capability Gap Identification Panel

Weapons Systems Experts

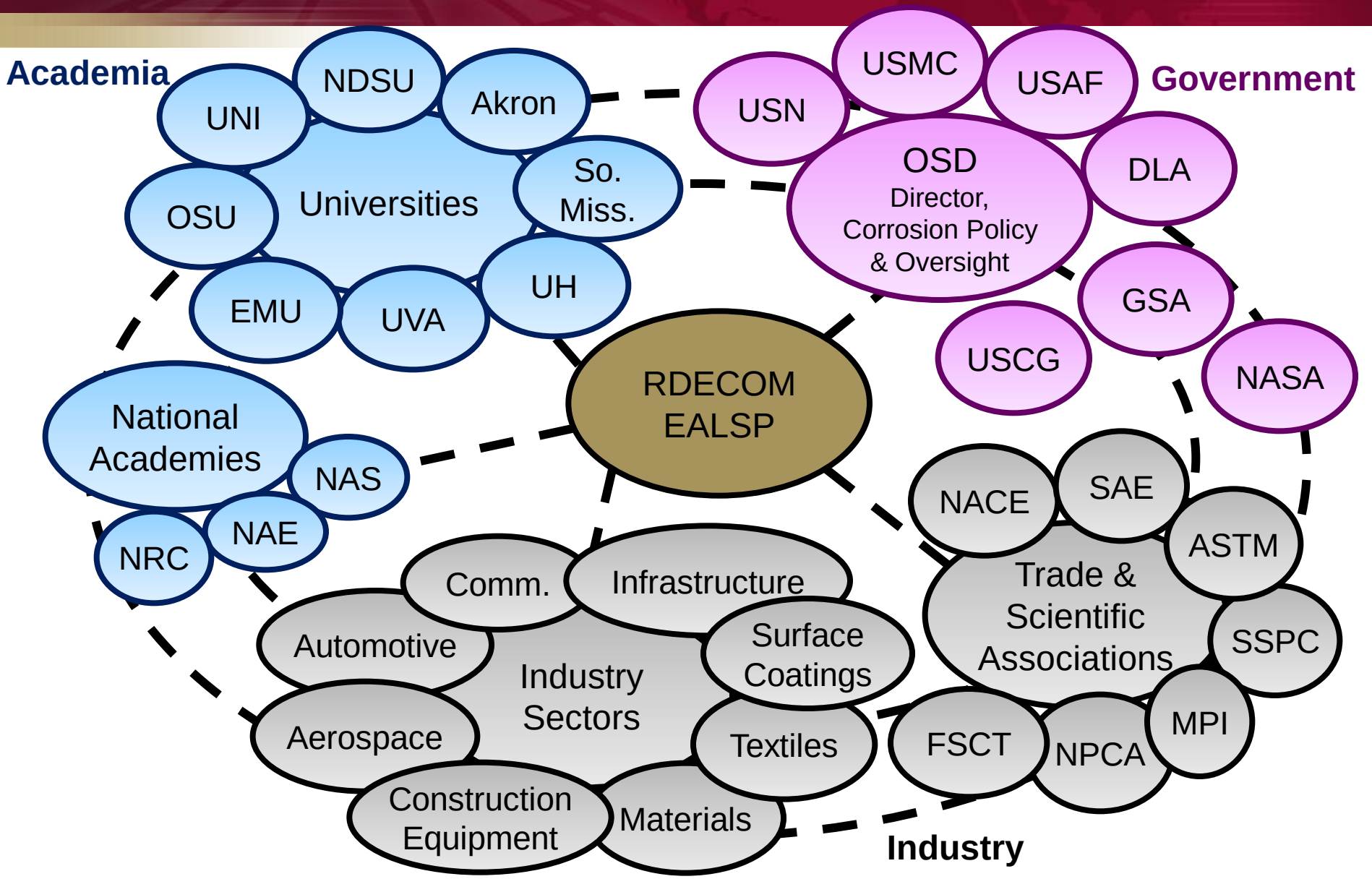
- PEO Ammunition
- PEO Aviation
- *PEO Command, Control and Communications-Tactical**
- PEO Combat Support and Combat Service Support
- PEO Ground Combat Systems
- PEO Missiles and Space
- PEO Soldier
- *JPEO Chemical and Biological Defense**
- PM Future Combat Systems
- Joint Munitions and Lethality LCMC
- Communications-Electronics Command LCMC

**Invited*

Corrosion Experts

- Non-RDECOM Army civilians
- Other service RDT&E laboratories
- Support contractors

Coordination Outside the Army



Proposed Program Requirements

Corrosion RDT&E Capability Gaps

1. Prevention of corrosion through product improvements for fielded systems
2. Assessment and correction of corrosion through field-level maintenance
3. Prevention of corrosion through design for new acquisition
4. Prevention of corrosion during operation and operational storage
5. Prevention of corrosion during long term storage or warehousing
6. Prevention of corrosion during transportation or temporary storage
7. Fulfillment of data gaps to accelerate mature technology qualification

Funding Needs, in Then-Year Dollars (thousands $)

	FY12	FY13	FY14	FY15	FY16	FY17
Total	5,824	12,941	20,859	21,235	21,617	22,007

Gap 1

Capability Gap 1: Prevention of corrosion through product improvements for fielded systems	
Item No.	**Supporting Capability**
1.1	Improved corrosion preventive products such as paints, sealants, lubricants, etc.
1.2	Guidance for optimal application of corrosion preventive products for different systems and environments
1.3	Techniques for depot-level repair of new materials and processes introduced during new production
1.4	Passive methods for preventing corrosive contaminants from adhering to equipment surfaces

Gap 2

Capability Gap 2: Assessment and correction of corrosion through field-level maintenance	
Item No.	**Supporting Capability**
2.1	Techniques for identifying under-paint corrosion of substrates
2.2	Techniques for monitoring corrosion of hidden/inaccessible components or compartments
2.3	Techniques for field-level repair and retouch of new materials and processes introduced during RESET
2.4	Field expedient removal of water from engine oil

Gap 3

Capability Gap 3: Prevention of corrosion through design for new acquisition	
Item No.	**Supporting Capability**
3.1	Accelerated corrosion test methods for full systems, assemblies and components
3.2	Accelerated corrosion test methods for test panels
3.3	Guidance and tools for assessing corrosion prevention during prototype design reviews
3.4	Guidance and tools for assuring adherence of production items to prototype CPC plans
3.5	Guidance for corrosion prevention best practices on all known substrates
3.6	Guidance for corrosion prevention best practices developed in conjunction with new material development
3.7	Demonstration of the quantitative benefits of addressing corrosion through design vice corrective action
3.8	Analysis of how to establish and measure corrosion metrics in system requirements documents
3.9	Analysis of corrosion effects on conductivity of electrical connectors

Gap 4

Capability Gap 4: Prevention of corrosion during operation and operational storage	
Item No.	**Supporting Capability**
4.1	Field expedient methods for keeping equipment clean and dry
4.2	Guidance for optimal washing/drying procedures for different systems and environments
4.3	Analysis of corrosion impacts caused by different basing strategies/locations

Gap 5

Capability Gap 5: Prevention of corrosion during long term storage or warehousing	
Item No.	**Supporting Capability**
5.1	Guidance for optimal long term storage for different systems and environments
5.2	Alternative dehumidification techniques not based on air conditioning
5.3	Alternative preservation techniques not based on dehumidification

Gap 6

Capability Gap 6: Prevention of corrosion during transportation or temporary storage	
Item No.	**Supporting Capability**
6.1	Improved packaging materials and techniques
6.2	Guidance for optimal packaging materials and techniques for different systems and environments
6.3	Secondary protection techniques after removal of items from primary packaging

Gap 7

Capability Gap 7: Fulfillment of data gaps to accelerate mature technology qualification	
Item No.	**Supporting Capability**
7.1	Compilation of lessons learned during upgrades to fielded systems
7.2	Toolbox of available technologies and techniques for original equipment manufacturers
7.3	Identification of actual corrosion performance requirements for hexavalent chromium and cadmium alternatives in common applications
7.4	Data to support implementation decisions for mature hexavalent chromium and cadmium alternatives
7.5	Non-corrosive methods for individual unit identification marking

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