<table>
<thead>
<tr>
<th><strong>1. REPORT DATE</strong></th>
<th>FEB 2010</th>
<th><strong>2. REPORT TYPE</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3. DATES COVERED</strong></td>
<td>00-00-2010 to 00-00-2010</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4. TITLE AND SUBTITLE</strong></td>
<td>Dynamic Strategies for Corrosion Prevention &amp; Control</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5a. CONTRACT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5b. GRANT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5c. PROGRAM ELEMENT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5d. PROJECT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5e. TASK NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5f. WORK UNIT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>6. AUTHOR(S)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</strong></td>
<td>U.S. Army Research Development and Engineering Comd, AMSRD-AMR-PS-AM, Redstone Arsenal, AL, 35898</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8. PERFORMING ORGANIZATION REPORT NUMBER</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10. SPONSOR/MONITOR’S ACRONYM(S)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>11. SPONSOR/MONITOR’S REPORT NUMBER(S)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>12. DISTRIBUTION/AVAILABILITY STATEMENT</strong></td>
<td>Approved for public release; distribution unlimited</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>13. SUPPLEMENTARY NOTES</strong></td>
<td>2010 U.S. Army Corrosion Summit, Huntsville, AL, 9-11 Feb</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>14. ABSTRACT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>15. SUBJECT TERMS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>16. SECURITY CLASSIFICATION OF:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>a. REPORT</strong></td>
<td>unclassified</td>
<td><strong>b. ABSTRACT</strong></td>
<td>unclassified</td>
</tr>
</tbody>
</table>

**Standard Form 298 (Rev. 8-98)**
Proscribed by ANSI Std Z39-18
Overview of Strategies

- Take positive **action to prevent and control** corrosion
- Establish and implement effective corrosion **management**
- Pursue comprehensive corrosion **education and training**
- Perform ground-breaking corrosion **research and development**
- Develop a nation-wide **anti-corrosion culture**
Positive Actions

- Prevent corrosion from happening
  - High percent of corrosion expense is downstream maintenance
  - Select corrosion-resistant materials
  - Design products to prevent or resist corrosion
  - Use production methods that don’t induce corrosion

- Predict if and when corrosion will occur
  - Sense the onset and growth rate of corrosion
  - Forecast impact of impending corrosion
  - Develop and apply early mitigation strategies

- Detect and treat actual corrosion
  - Implement effective processes to detect corrosion
  - Select effective, long-lasting coatings and other treatments
  - Tailor corrosion repair or replacement to conditions & expectations
Effective Corrosion Management

- Increase management recognition of impact of corrosion on performance, safety & readiness

Acquisition managers need to know
- Vulnerability of systems to corrosion
- Effects of corrosion on performance, readiness and safety
- Trade-offs to reduce/eliminate vulnerability
- Life cycle costs of alternatives
- Criteria for effective decision-making

Operational managers need to know
- All the above
- How to establish corrosion requirements
- How to select corrosion resistant systems
DoD Corrosion Organization

USD
Acquisition, Technology, and Logistics

- DUSD, Logistics and Materiel Readiness
- Director, Defense Research and Engineering DUSD, Science and Technology
- DUSD, Acquisition and Technology
- DUSD, Installations and Environment

Director, Corrosion Policy and Oversight

- Army Corrosion Executive
- AF Corrosion Executive
- Navy Corrosion Executive

WIPTs

DoD Corrosion Prevention and Control IPT

- Policy and Requirements
- Outreach and Communications
- Metrics, Impact and Sustainment
- Facilities
- Training and Certification
- Specifications/Standards and Product Qualification

IPT member representatives:
- OSD
- Joint Staff/J-4
- Army
- Navy
- Air Force
- Marine Corps
- Army Corps of Engineers
- Joint Council for Aging Aircraft
- National Aeronautics and Space Administration
- US Coast Guard
- Defense Logistics Agency
- General Services Administration
Corrosion Education and Training

- National Academies study
  - Assessed undergraduate corrosion education in engineering programs
  - Corrosion engineers only educated at the graduate level
  - Varied curricula and concentrations

- Corrosion engineering education
  - Critical mass of true corrosion engineers and scientists needed
  - Corrosion Engineering Degree at University of Akron

- Corrosion training expanded
  - NACE, SSPC and other technical societies are vital training resources
  - New corrosion training videos in use or development
  - Defense Acquisition University training managers and acquisition officials
New, ground-breaking technology solutions are needed
- Fundamental aspects of corrosion science and engineering not fully understood
- Hard to reliably predict susceptibility and course of corrosion in materials
- Advances are needed in fundamental research and basic understanding of corrosion

Six universities collaborating in pilot program to address an array of basic and applied research needs such as
- Environmental effects on coating formulations
- Inhibitor-binder synergy
- Corrosion resistance characteristics of Mg-rich primer
- Environmental effects on corrosion
- Accelerated lab test data relation to field data

International university collaborations also underway
Corrosion not accepted as inevitable
- Recognized as insidious and pervasive
- Can be prevented or treated
- Can be detected
- Can be predicted
- Can be managed

Integrated state and national programs
- Preserve and maintain infrastructure
- Support corrosion research and development
- Broad education and training
- Design for corrosion prevention

Significant outreach programs underway
- Technical societies
- Videos, games and podcasts
Results to Date

- DoD Corrosion Program has been autocatalytic
  - Produces self-reproducing emergent results
  - Depends on sound, new, dynamic strategies
  - Success achieved through prior implemented strategies

- Recognition by GAO and Congress for
  - Institutionalized and documented modern corrosion management policies and methods
  - Validating the extremely high annual DoD cost of corrosion of over $22 billion
  - Certifying savings of over $6.37 billion on 169 R&D projects during six years, with a 50 to 1 ROI
  - Army projects show $2.7 billion savings on 72 projects, by investing $32 M with DoD’s $29 M for a 48 to 1 ROI
Conclusion - What We Want to Accomplish

- Emphasize **corrosion prevention**
- Increase DoD management **recognition of impact of corrosion** on performance, safety & readiness
  - **Focus on high-cost causes** of corrosion
  - **Slash** the DoD **cost of corrosion** by increasing investment in high-payoff, high impact projects
- Create a **critical mass of true corrosion engineers** and scientists
- Generate **new, effective technological solutions**
- Develop a **national anti-corrosion culture**
  - Implement expanded outreach programs
  - Facilitate added **cooperative** inter-service, inter-agency and international corrosion programs