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Exhibit R-2, RDT&E Budget Item Justification: PB 2016 Office of the Secretary Of Defense **Date:** February 2015

Appropriation/Budget Activity 0400: <i>Research, Development, Test & Evaluation, Defense-Wide I BA 4: Advanced Component Development & Prototypes (ACD&P)</i>	R-1 Program Element (Number/Name) PE 0604016D8Z / <i>Department of Defense Corrosion Program</i>
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COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
Total Program Element	64.470	19.637	12.907	1.518	-	1.518	4.010	3.897	3.561	3.610	Continuing	Continuing
P015: <i>Corrosion Protection Projects</i>	64.470	19.637	12.907	1.518	-	1.518	4.010	3.897	3.561	3.610	Continuing	Continuing

Note

The FY 2016 funding request was reduced by \$1.521 million to account for the availability of prior year execution balances.

A. Mission Description and Budget Item Justification

The purpose of this program is to develop a comprehensive capability to prevent and mitigate corrosion and its effects on Department of Defense (DoD) weapon systems and infrastructure. Corrosion severely impacts system and facility reliability, readiness and safety, and consumes a disproportionate amount of material and labor hours for repair and treatment of corrosion damaged systems and facilities. The cost of corrosion across the DoD has been estimated at over 23 billion each year. The impact and cost of corrosion are so pervasive that Congress enacted Public Law 107-314 Sec: 1067 [portions codified in 10 U.S.C. 2228]: Prevention and mitigation of corrosion of military infrastructure and equipment. This legislation requires that DoD develop a long-term corrosion strategy to include establishment of a coordinated R&D program with transition plans. The legislation also requires that DoD designate a responsible official or organization to oversee a corrosion prevention and mitigation program. The responsibilities of the Director, Corrosion Policy and Oversight and the Military Department Corrosion Prevention and Control Executives were further delineated in DODI 5000.67 "Prevention and Mitigation of Corrosion on Military Equipment and Infrastructure" of 01 February 2010.

The Deputy Secretary of Defense designated the Principal Deputy Under Secretary of Defense (Acquisition, Technology, and Logistics) (PDUSD(AT&L)) as the DoD Corrosion Executive in May 2003. The DoD Corrosion Executive subsequently established a Corrosion Control and Oversight office to implement the program. Subsequently, in accordance with Section 371 of the 2008 National Defense Authorization Act, the Under Secretary of Defense (USD(AT&L)) designated a Director, Corrosion Policy and Oversight to perform the duties of the DoD Corrosion Executive with responsibilities as described in the 2008 NDAA legislation. A major responsibility of the Director, Corrosion Policy and Oversight is to select high payoff research and development projects that promise to prevent or mitigate corrosion and significantly reduce the total cost of corrosion along with the adverse impact of corrosion effects on weapon system and infrastructure operational capability. This office chartered a Corrosion Prevention and Control Integrated Product Team (CPCIPT) that has selected and funded Operation and Maintenance projects for each Fiscal Year (FY) commencing in FY 2005. However, the DoD CPCIPT has determined that the biggest payoff in corrosion prevention and mitigation will come from investing in up-front prevention technologies, materials, and processes to leverage downstream cost avoidance in corrosion maintenance and repair. Likewise, development of improved predictive and prognostic techniques can eliminate unseen failure and reduce unnecessary maintenance and repair costs. Thus, technology development, demonstration, and transition projects have been selected and funded since FY 2006. In addition, the University Corrosion Collaboration (now the Technical Corrosion Collaboration (TCC)) was formed as a collaboration between universities, academies and research laboratories, focused on corrosion technology research and development to provide solutions to long-term, complex corrosion prevention and control problems, including metallic-non-metallic interactions, advanced surface coatings and treatments for non-traditional use of materials. This advanced corrosion research has been funded since FY 2008 and performed by teams from TCC participating organizations.

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In FY 2009, the Military Departments assigned corrosion executives and began submitting reports to Congress on inserting corrosion planning into the acquisition process. The FY 2011 NDAA added a requirement for the DoD to report the amount of funds requested in the preceding year budget for each planned project or activity, as compared to the funding required for each project or activity. These funds provide a portion of the funds used to implement associated corrosion control projects and activities.

These projects address critical corrosion issues in both Department of Defense infrastructure as well as warfighting systems. A number of low-risk, high-payoff technologies promise to vastly improve the service life and significantly reduce the maintenance costs of storage tanks and other mission support facilities essential to maintain support for the warfighter. Each of the services has identified important projects that vastly increase operational readiness and reduce operations and maintenance costs. All services are studying corrosion inhibitors that improve reliability and life of electrical and avionics equipment. Likewise, an array of highly effective, rapid cure coatings that are easy to apply and can forestall corrosion for many years on aircraft and ships are being developed. Other vital projects being considered include sealants, wash down systems, sensors and prognostic technologies that have joint service applications and potential to prevent and mitigate corrosion and its effects over a wide range of systems.

B. Program Change Summary (\$ in Millions)	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total
Previous President's Budget	20.312	2.907	3.055	-	3.055
Current President's Budget	19.637	12.907	1.518	-	1.518
Total Adjustments	-0.675	10.000	-1.537	-	-1.537
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	10.000			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-0.675	-			
• Other Internal Baseline Adjustments	-	-	-1.537	-	-1.537

Congressional Add Details (\$ in Millions, and Includes General Reductions)

Project: P015: *Corrosion Protection Projects*

Congressional Add: *Corrosion Control, Prevention and Prediction through Coatings, Materials and Maintenance R&D*

Congressional Add Subtotals for Project: P015

Congressional Add Totals for all Projects

	FY 2014	FY 2015
Congressional Add: <i>Corrosion Control, Prevention and Prediction through Coatings, Materials and Maintenance R&D</i>	16.325	-
Congressional Add Subtotals for Project: P015	16.325	-
Congressional Add Totals for all Projects	16.325	-

Change Summary Explanation

Baseline adjustment reflects funding for internal AT&L priorities and requirements.

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NOTE: The FY 2016 funding request was reduced by \$1.521 million to account for the availability of prior year execution balances.

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Exhibit R-2A, RDT&E Project Justification: PB 2016 Office of the Secretary Of Defense										Date: February 2015		
Appropriation/Budget Activity 0400 / 4					R-1 Program Element (Number/Name) PE 0604016D8Z / Department of Defense Corrosion Program				Project (Number/Name) P015 / Corrosion Protection Projects			
COST (\$ in Millions)	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	FY 2017	FY 2018	FY 2019	FY 2020	Cost To Complete	Total Cost
P015: Corrosion Protection Projects	64.470	19.637	12.907	1.518	-	1.518	4.010	3.897	3.561	3.610	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

The purpose of this program is to develop a comprehensive capability to prevent and mitigate corrosion and its effects on Department of Defense (DoD) weapon systems and infrastructure. Corrosion severely impacts system and facility reliability, readiness and safety, and consumes a disproportionate amount of material and labor hours for repair and treatment of corrosion damaged systems and facilities. The cost of corrosion across the DoD has been estimated at over 23 billion each year. The impact and cost of corrosion are so pervasive that Congress enacted Public Law 107-314 Sec: 1067 [portions codified in 10 U.S.C. 2228]: Prevention and mitigation of corrosion of military infrastructure and equipment. This legislation requires that DoD develop a long-term corrosion strategy to include establishment of a coordinated R&D program with transition plans. The legislation also requires that DoD designate a responsible official or organization to oversee a corrosion prevention and mitigation program. The responsibilities of the Director, Corrosion Policy and Oversight and the Military Department Corrosion Prevention and Control Executives were further delineated in DODI 5000.67 "Prevention and Mitigation of Corrosion on Military Equipment and Infrastructure" of 01 February 2010.

The Deputy Secretary of Defense designated the Principal Deputy Under Secretary of Defense (Acquisition, Technology, and Logistics) (PDUSD(AT&L)) as the DoD Corrosion Executive in May 2003. The DoD Corrosion Executive subsequently established a Corrosion Control and Oversight office to implement the program. Subsequently, in accordance with Section 371 of the 2008 National Defense Authorization Act, the Under Secretary of Defense (USD(AT&L)) designated a Director, Corrosion Policy and Oversight to perform the duties of the DoD Corrosion Executive with responsibilities as described in the 2008 NDAA legislation. A major responsibility of the Director, Corrosion Policy and Oversight is to select high payoff research and development projects that promise to prevent or mitigate corrosion and significantly reduce the total cost of corrosion along with the adverse impact of corrosion effects on weapon system and infrastructure operational capability. This office chartered a Corrosion Prevention and Control Integrated Product Team (CPCIPT) that has selected and funded Operation and Maintenance projects for each Fiscal Year (FY) commencing in FY 2005. However, the DoD CPCIPT has determined that the biggest payoff in corrosion prevention and mitigation will come from investing in up-front prevention technologies, materials, and processes to leverage downstream cost avoidance in corrosion maintenance and repair. Likewise, development of improved predictive and prognostic techniques can eliminate unseen failure and reduce unnecessary maintenance and repair costs. Thus, technology development, demonstration, and transition projects have been selected and funded since FY 2006. In FY 2009, the Military Departments assigned corrosion executives and began submitting reports to Congress on inserting corrosion planning into the acquisition process. The FY 2011 NDAA added a requirement for the DoD to report the amount of funds requested in the preceding year budget for each planned project or activity, as compared to the funding required for each project or activity. These funds provide a portion of the funds used to implement associated corrosion control projects and activities.

These projects address critical corrosion issues in both Department of Defense infrastructure as well as warfighting systems. A number of low-risk, high-payoff technologies promise to vastly improve the service life and significantly reduce the maintenance costs of storage tanks and other mission support facilities essential to maintain support for the warfighter. Each of the services has identified important projects that vastly increase operational readiness and reduce operations and maintenance costs. All services are studying corrosion inhibitors that improve reliability and life of electrical and avionics equipment. Likewise, an array of highly

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effective, rapid cure coatings that are easy to apply and can forestall corrosion for many years on aircraft and ships are being developed. Other vital projects being considered include sealants, wash down systems, sensors and prognostic technologies that have joint service applications and potential to prevent and mitigate corrosion and its effects over a wide range of systems.

B. Accomplishments/Planned Programs (\$ in Millions)

	FY 2014	FY 2015	FY 2016
<p>Title: Corrosion Prevention and Control Projects and Activities</p> <p>FY 2014 Accomplishments: Initiated the development and transition of mature corrosion control technologies for use by the Services (i.e., Army, Navy, Air Force) Published Weapon Systems and Equipment Corrosion Prevention and Control Guidebook Provided oversight of corrosion planning for ACAT I systems Completed impact of corrosion studies for Navy and USMC aviation and Air Force aircraft and missiles Reinstated MIL-STD-1568 Completed work on four (4) web-based training modules. Posted training on www.corrconnect.org Posted corrosion prevention and control guidance for facilities and infrastructure on Whole Building Design Guide website</p> <p>FY 2015 Plans: Continue to work with the Services to develop and transition mature technologies Refine and improve acquisition policies related to corrosion control Continue to provide oversight of corrosion planning for ACAT I systems Complete impact of corrosion studies on additional defense segments; develop predictive capabilities Issue MIL-HDBK-1250 as non-governmental standards Develop non-governmental standard on "Corrosion Planning" for equipment and infrastructure Re-issue DoDI 5000.67 "Prevention and Mitigation of Corrosion on DoD Military Equipment and Infrastructure" Deploy major upgrade to Product Introduction Tool</p> <p>FY 2016 Plans: Continue to work with the Services to develop and transition mature technologies Refine and improve acquisition policies related to corrosion control Continue to provide oversight of corrosion planning for ACAT I systems Complete impact of corrosion studies on additional defense segments; develop predictive capabilities Issue joint SSPC/NACE standard on Corrosion Planning</p>	3.312	12.907	1.518
Accomplishments/Planned Programs Subtotals	3.312	12.907	1.518

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		FY 2014	FY 2015
<p>Congressional Add: Corrosion Control, Prevention and Prediction through Coatings, Materials and Maintenance R&D</p> <p>FY 2014 Accomplishments: Funded additional corrosion prevention and control (CPC) technology insertion projects:</p> <ul style="list-style-type: none"> a) Polyurethane gaskets for topside ship applications b) Geopolymer Nano-Ceramic Liner System c) Qualification of DiEthylene Glycol Mono-Methyl Ether (DiEGME) d) Advanced Corrosion Evaluation System (ACES) Validation and Testing on Family of Medium Tactical Vehicles (FMTV) e) Cleaning Mechanisms for Up Armored Vehicles f) Engineered Coatings for Fasteners g) Specification of Industrial Human Augmentation System for Corrosion Control h) Robotic Portable Dimensional Corrosion Repair for Aircraft i) Transition of Novel and Automated Nonskid Spray Equipment to the Regional Maintenance Centers j) Calcium Sulfonate Coating for Crevice Corrosion k) Chip Resistant Polyurethane High Build Coatings l) Rust and Mill Scale Remover m) Fuel Safe Insertable Stalk Inspection System (ISIS) Industrialization n) Polymer Concrete Pipe o) Zirconium Oxide Pretreatment p) Institutionalization of High Heat Resistant Coatings q) Durable Concrete Repairs <p>Continued execution of the Technology Corrosion Collaboration focusing on technologies to reduce the impact of corrosion on DoD equipment and infrastructure.</p> <ul style="list-style-type: none"> a) Expanded role of Services' subject matter experts in focusing research on DoD corrosion challenges b) Funded corrosion-related research and curriculum development at each of the Service Academies c) Held open call for research proposals and received 54 submissions; added Arizona State University and Southwest Research Institute for FY 2014 d) 72 graduate students supported – future core of the DoD corrosion community e) 56 scientific journal articles or technical reports published 		16.325	-
Congressional Adds Subtotals		16.325	-

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C. Other Program Funding Summary (\$ in Millions) N/A		
Remarks		
D. Acquisition Strategy Acquisitions are accomplished in three categories including projects, research opportunities, and activities as described in the DoD Corrosion Prevention and Mitigation Strategic Plan. Projects are funded jointly by CPO and the Military Departments and are led by subject matter experts at the Military Department laboratories. CPO issues a call for proposed project plans in April and projects are submitted in June. The project plan format is contained in the DoD Corrosion Prevention and Mitigation Strategic Plan. The Corrosion Prevention and Control Integrated Project Team (CPCIPT) receives project plans and engages an evaluation panel to review proposed projects and make recommendations regarding project selection. Projects are also evaluated using Data Envelopment Analysis (DEA) to rank projects by relative efficiency. DEA factors include project performance period, ratio of OSD funding to Service funding, return-on-investment (ROI), degree to which the proposed technology addresses high-cost corrosion problems, potential benefits, joint service applicability, and probability of transition. Upon acceptance and approval of the projects, funding is distributed to the Military Departments by Military Interdepartmental Purchase Request (MIPR) based on funding priorities associated with the evaluation process results. Project execution is monitored through submission of quarterly quad charts and by conducting an annual review. Research opportunities are funded through the Technical Corrosion Collaboration (TCC). A call for white paper proposals is issued by CPO through an existing U.S. Air Force Academy (USAFA) Broad Agency Announcement (BAA). Submissions are evaluated by a technical panel chaired by the Deputy Director, CPO. Evaluation factors include quality of proposed research, potential impact on DoD corrosion problems, level of student involvement, and proposed collaboration between the research institutions and DoD laboratories. Projects are ranked by the selection panel and funded based on merit and available funds. Research institutions receive funds for the TCC through the establishment of cooperative agreements with USAFA. Research execution is monitored through submission of quarterly quad charts and by conducting an annual review. Activities are those work efforts associated with the Working Integrated Product Teams (WIPT) under the CPCIPT and include policy, training, specifications and standards, metrics, science and technology, facilities, and communication and outreach. WIPT Leads submit funding requirements associated with their annual tactical plan submission to CPO. The proposed activities are prioritized by CPO and funded based on merit and available funds. Activities are accomplished by both government and contractor personnel. Funds are transferred to government personnel through the MIPR process. Funds are transferred to contractor personnel through competitively awarded contracts including the multiple-award Blanket Purchase Agreement held by CPO. Progress on activities is reviewed tri-annually at meetings of the CPCIPT.		
E. Performance Metrics Not applicable.		

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Exhibit R-3, RDT&E Project Cost Analysis: PB 2016 Office of the Secretary Of Defense **Date:** February 2015

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Product Development (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Corrosion Policy and Oversight	MIPR	Various (Army, Navy, Air Force) : Various	63.242	16.634	Oct 2013	10.000		-		-		-	-	89.876	-
Subtotal			63.242	16.634		10.000		-		-		-	-	89.876	-

Management Services (\$ in Millions)				FY 2014		FY 2015		FY 2016 Base		FY 2016 OCO		FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost	Award Date	Cost			
Corrosion Policy and Oversight	MIPR	Logistics Management Institute : McLean, VA	1.228	1.729	Oct 2013	1.790	Oct 2014	-	Oct 2015	-		-	Continuing	Continuing	Continuing
Corrosion Policy and Oversight	MIPR	Decisive Analytics Corporation : Arlington, VA	0.000	1.274	Oct 2013	1.117	Oct 2014	1.518	Oct 2015	-		1.518	Continuing	Continuing	Continuing
Subtotal			1.228	3.003		2.907		1.518		-		1.518	-	-	-

	Prior Years	FY 2014	FY 2015	FY 2016 Base	FY 2016 OCO	FY 2016 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	64.470	19.637	12.907	1.518	-	1.518	-	-	-

Remarks

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Office of the Secretary Of Defense		Date: February 2015
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Schedule Details

Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
<i>Corrosion Policy and Oversight</i>				
DoD 5000-Series Review	1	2014	4	2014
Integration of CPC and CPC-Related Policy	1	2014	1	2015
DAG Review	1	2014	4	2014
Corrosion Board of Directors	1	2014	4	2014
DoD Corrosion Prevention and Mitigation Strategic Plan	1	2014	1	2015
USC Engagement	1	2014	4	2014
GAO Engagement	1	2014	4	2014
Corrosion Technology Implementation Projects Support	1	2014	4	2014
Training Gap Analysis	1	2014	1	2015
Corrosion Website Sustainment	1	2014	1	2015
Product Introduction and Qualification Tool	1	2014	1	2015
Facilitate/Support Corrosion Events	1	2014	1	2015
International Corrosion Partnerships and Engagements	1	2014	4	2014
Programmatic Support	1	2014	4	2014
Technical Corrosion Collaboration	1	2014	4	2014
<i>Corrosion Technology Support</i>				
Corrosion Prevention and Control Review	1	2014	4	2014
DFARS Support	1	2014	4	2014
Funding Reviews	1	2014	4	2014
Weapon Systems and Infrastructure Oversight Support	1	2014	1	2015
Military Department Corrosion Program Review	1	2014	1	2015

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Exhibit R-4A, RDT&E Schedule Details: PB 2016 Office of the Secretary Of Defense **Date:** February 2015

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Events by Sub Project	Start		End	
	Quarter	Year	Quarter	Year
Corrosion Technology Implementation Project Reviews	1	2014	1	2015
Corrosion Subject Matter Experts	1	2014	4	2014