

**Statement of Qualifications
for
Professional Engineering Services**



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Introduction

Elzly Technology Corporation provides technical consulting services to customers needing specialized knowledge and experience in materials technology. We use our background and rigorous analyses to provide superior advice. Culturally, we recognize that our products have an impact beyond the immediate task at hand. Strategically, we attempt to consider all issues and bring the most effective solution to our customers.

Elzly staff possess strong analytical skills grounded in the intricacies of “real world” operations. Elzly personnel include professional engineers with over 20 year’s experience. We have worked for various DoD services, Federal/ State/ Local Government agencies, and the private sector. Our experience allows us to bring a broad perspective to our customers.

Elzly addresses material preservation and sustainable processes development in various industries. The services relate to corrosion control, material selection, and process-analytics for environmentally sustainable practices. Our experience includes the development of technical reports, research and development, field studies, and production analyses.

Typical Elzly services include:

- Engineering Studies
- Corrosion Surveys
- Design Review
- Program Management
- Literature Review
- Forensic Investigations
- Preliminary Design
- Feasibility Assessments
- Specification Development
- Research
- Policy Development
- Process Review
- Pollution Prevention
- Opportunity Assessments

Selected Elzly experience includes:

Corrosion Engineering – Elzly provides engineering services to address key aspects of the Navy’s shipboard corrosion control program. This includes the development of technical specifications / manuals for cathodic protection of ship hulls and equipment; corrosion evaluation of ship coating systems; and development of corrosion control training classes for Naval-ship designers.

Elzly personnel perform corrosion engineering services for a wide variety of structures. Our engineers were instrumental in developing corrosion control testing protocols for Army, Marine Corps, and commercial ground vehicle systems. Elzly personnel also have extensive experience with

fixed infrastructure such as highway bridges, offshore platforms, petrochemical facilities, and pipelines.

Elzly personnel have provided analyses of the barrier properties of protective coatings; development of mathematical and statistical models for coating failure; materials selection / design analysis; field investigations of ship corrosion problems; and paint formulation / qualification.

Environmentally-Sustainable Material Applications – Elzly supports the Army Materiel Command to investigate and implement environmentally-sustainable practices in weapon system design and procurement. These tasks use engineering and policy to minimize environmental-degradation caused by materials used / applied in weapon system fabrication, training, maintenance, and disposal. Key technical issues include the potential impact of emerging regulations on heavy metals on weapon system preservation technologies and the development of weapon-systems EMS systems.

Elzly personnel are working with the Navy and the Coast Guard to develop less toxic antifouling coating systems for ship hulls. In conjunction with the development of Uniform National Discharge Standards, various strategies for minimizing the potential environmental hazard of antifouling coating are being evaluated. Elzly is involved in the identification and field evaluation of these technologies.

Elzly personnel have worked with both the Army, Navy and commercial customers to evaluate and implement a wide range of pollution-prevention technologies associated with hazardous materials. This included testing of hexavalent chromium alternatives, cadmium substitutes, low-VOC/HAP coatings, and alternative materials.

Regulatory Impact Assessments - Elzly is supporting the Naval Facilities Command – HQ to resolve the impact of EPA-proposed regulations on protective coating operations. Concerns include solvents used in corrosion control for paints and surface cleaning. Elzly is studying the potential impact of regulations on paint selection, installation logistics, and preservation processes. The goal is to arrive at a regulation that is environmentally protective yet considerate of key military needs. This effort included reviewing datacalls to ascertain the levels of solvents within primary-use DoD coating systems and reviewing / mitigating the impact of the pending regulation on Navy installations.

Our broad experience base and dedication to customer service provides our customers with timely, insightful, and practical solutions to their materials engineering problems.

James A. Ellor, P.E.

Education/Qualifications

B.S., Chemical Engineering, University of California, Berkeley, CA, 1982
Registered Professional Engineer – Chemical: New Jersey, # GE 32393; Virginia, 0402 026379;
Maryland, 22211
NACE Certified Corrosion Specialist, 3291
NACE Certified Cathodic Protection Specialist, 3291

Experience Summary

Mr. Ellor has over twenty-three (23) years experience in the corrosion industry with an extensive focus on corrosion control with DoD material and weapon systems. Mr. Ellor is currently a senior engineer with Elzly Technology Corporation. Prior to his position with Elzly, Mr. Ellor served as vice president of Corrpro Companies Inc. with responsibility for Corrpro's DoD contracting business and technologies. Previous to his assignment with Corrpro, Mr. Ellor served as vice president of Ocean City Research Corporation in responsible charge of their laboratory RDT&E related to corrosion control and materials evaluation.

A summary of his key background includes:

- From 1982 through 2005, Mr. Ellor has worked with the Corrosion Control Division of the Naval Sea Systems Command. Over this period, Mr. Ellor has served as a project engineer and program manager on efforts encompassing most aspects of ship hull, mechanical, and electrical maintenance issues. Mr. Ellor had complete responsibility for corrosion engineering analyses in areas of materials selection, cathodic protection design, and coatings engineering. This included management and technical direction of laboratory RDT&E in support of the contract objectives. Key technical programs included an analysis of the use of electrical techniques for characterizing the barrier properties of protective coatings; development of mathematical models and statistical models for coating failure; specification development for immersion and atmospheric coatings; cathodic protection design; materials / design analysis of EMI-shielding properties of connectors and gaskets; field investigations of ship-system corrosion problems; interface with shipbuilders / depot maintenance activities; analysis of the life-cycle and repair costs of ship coating systems; studies of ultrahigh pressure water-jetting for surface preparation before painting; the effect of painting over surface rusting on coating life; paint formulation / qualification in response to EPA NESHAPs; evaluation of cadmium plating alternatives; qualification of single-coat painting schemes; control of the costs of underwater hull painting; and the qualification of decking materials.
- Over the 2002 – 2005 timeframe, Mr. Ellor established a strategy for providing Preservation Team Services (PTS) to the Navy. PTS are contractor-teams who conduct O-level maintenance painting in lieu of sailors. Within an era of reduced manning, the program intended to “free” sailors from routine tasks to allow them to concentrate on other training. Through the use of corrosion professionals, the program provided a higher quality coating systems. The PTS effort included determining the requisite operating personnel qualifications, establishing technical standards and QA/engineering personnel requirements, and budgets and schedules for program execution. These models were initially implemented in a Norfolk-based carrier and amphibious class teams and later expanded to provide services in five (5) other locations: Mayport, Ingleside, San Diego, Bangor, and Pearl Harbor.
- Beginning in 2004, Mr. Ellor provided analysis and support to the Naval Facilities Command (HQ) and CNO N45 Directorate on the evolution of a new National Emission Standard for

Hazardous Air Pollutants (NESHAP) governing Defense Land Systems and Miscellaneous Equipment (DLSME). This effort has including review datacalls to ascertain the levels of HAP's within primary-use DoD coating systems and reviewing / mitigating the impact of the pending regulation on Navy installations.

- Beginning in 2005, Mr. Ellor provides on-site engineering support to the Army Environmental Support Office (ESO). This has involved support of initiatives within both the Army Material Command and the Assistant Secretary of the Army (Acquisition, Logistics, and Technology) offices concerning the implementation of policies and technologies intended to mitigate environmental problems within the design and acquisition stages of materiel development. Key technical issues include the potential impact of emerging regulations on hexavalent chromium and the development of weapon-systems EMS systems. Previous to on-site support, Mr. Ellor worked with the ESO and its predecessor offices to evaluate and implement a wide range of pollution-prevention technologies associated with reduction of hazardous materials used in Army weapon systems. This included testing of hexavalent chromium alternatives, cadmium substitutes, low-VOC/HAP coatings, and alternative materials.
- Since 2000 served as the principal investigator for several National Academy of Sciences / National Cooperative Highway Research Programs. These included development of appropriate specifications for the use of Thermally Sprayed Metallic Coatings to Protect Steel Piling and evaluation of the Corrosivity of different Soil Environments. The thermal spray program identified metallic coating systems and application process that provide long-term corrosion control for steel piling in a marine exposure. The corrosivity program evaluated methods to correlate soil characteristics with the resultant corrosion rate of different construction materials. This program included the development of sensing technologies for monitoring the onset of soil corrosion and soil corrosivity on buried structures. Data analysis included the development of models relating corrosion to the environmental conditions. These models included multi-variant analysis and neural network analysis of these data.
- Mr. Ellor developed computerized data monitoring systems and machine language programming of integrated circuits used in corrosion and fracture mechanics test monitoring. This work was conducted for Chevron Oil Company and the Baltimore Gas and Electric Company.
- Mr. Ellor served as Principal Investigator for DoT/FHWA projects involving the remote monitoring and correlation of environmental parameters with the deterioration of coated test panels. Monitoring included the development of time of wetness sensors and corrosion "fuses" to indicate the deterioration of boldly exposed steel test materials. The project established test sites at six locations across the country to represent the broad range of environmental constituents that affect corrosion and coating breakdown of bridge corrosion control materials. The test sites, environmental parameters, and specimen test design were based upon an initial literature review and some preliminary testing designed to insure meaningful results from the field trials. (1995-2004)
- Also for the DoT/FHWA evaluated and developed correlations between the corrosion deterioration of corrugated metal culverts and the exposure conditions. This process used various Weibull distribution analyses to identify key relationships among the data sets.
- Conducted a study of the concerns associated with the use of different chemicals in tank truck trailers for the Federal Highway Administration. The program included the inspection of several tank truck trailers from around the country and the correlation of the corrosion observed with the contents and operating practices of the trailers (i.e., cleaning cycles).
- Conducted an evaluation of the impressed current cathodic protection (ICCP) system effectiveness on several classes of Navy ships. This includes the DDG-51 and CG-47 class of

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surface ships and the SSN-21 class of submarines. The process has included many ship field studies, vendor information review, cost estimates, and laboratory testing of critical corrosion phenomena including coating/ICCP interaction. (1993-2002)

- Conducted an evaluation and design of cathodic protection systems for underground fuel tanks located at various storage facilities in the state of Virginia, cathodic protection of underground fuel lines at Dulles International Airport, and corrosivity surveys for major oil storage facilities. (2000-2003)
- For the Electric Power Research Institute, Mr. Ellor served as the lead engineer in a program to investigate the interrelationship of dissolved oxygen, sulfide, and temperature on the corrosion rates of copper alloys exposed to flowing, natural seawater. The program adopted a matrix approach to control the chemistry of the seawater to the program bounds and used electrochemical techniques to monitor the alloy corrosion rates. The program also investigated the effectiveness of various corrosion inhibitors in mitigating the corrosion observed. (1985)
- Mr. Ellor served as lead engineer on a research effort for the Electric Power Search Institute studying corrosion and corrosion control of condenser tubes. He has also served as a lead engineer on over 10 other projects concerning corrosion of power plant steam surface condensers. These investigations have included studying the effects of chlorination, cathodic protection, and galvanic corrosion of tube and tubesheet materials.
- For AT&T Bell Labs, Mr. Ellor was the lead engineer in a lab study of the effect of various levels of dissolved oxygen and temperature on the corrosion rates of selected mixed-metals used in sub-sea telecommunications equipment. The program showed how the galvanic corrosion rates of steel, copper, and lead alloys, joined in mixed-metal couples, varied as a function of the local environment.
- For a major above-ground storage tank owner, Mr. Ellor served as the lead engineer on a project to document the current tank corrosion condition. This involved determining the remaining wall thickness for the tanks using a B-scan ultrasonic inspection technique. The wall thickness data were compared to the original wall thickness and predictions/recommendations made to extend the service life of the tanks. (1999)

Professional Affiliations:

NACE International (formerly National Association of Corrosion Engineers)
Past Chairman, NACE Task Group T-7C, Marine Corrosion
SSPC - Society for Protective Coatings (formerly Steel Structures Painting Council)

Technical Papers:

“Electrostatic Modeling of Cathodic Protection Systems,” J. Ellor, technical paper to be presented at Corrosion 2006, San Diego, CA (March 2006)

“Experimentation to Develop a Quantitative Method for Characterizing the Level of Flash Rusting Formed on Carbon Steel after Ultra High Pressure Waterjetting,” M. Islam, W. McGaulley, M. Evans, and J. Ellor, technical paper to be presented at PACE 2006, Tampa, FL

“Investigating Tests for Antifoulants: Variation Between Laboratory and In-Situ Methods for Determining Copper Release Rates from Navy-Approved Coatings,” *Journal of Protective Coatings and Linings*, Volume 22, Number 8 (August 2005)

"Engineer/Constructor Perspective on Preservation Using Waterjetting," J. Ellor & J. Gillard, RUST 2004, Louisville, KY

"Uniform (Corrosion)" J.A. Ellor, Corrosion Tests and Standards: Application and Interpretation, ASTM Manual 20, ASTM, Philadelphia, PA, 1995, 2003

"Long Term Corrosion Control by Thermal Spray Metallic Coatings," J. Ellor, J. Repp, and W. Young, Tri-Services Corrosion Conference, 2003, Las Vegas, NV

"Quantification of Curing Stresses in Paints and Coatings," M. Islam, J. Repp, J. Ellor, & B. Shaw, SSPC 2003, New Orleans, LA

J.A. Ellor, "How Economics Drive Change in Managing Maintenance Costs," Presentation at SSPC 2001 Conference, Orlando, FL, SSPC Pittsburgh, PA

"Recent experience with ship and laboratory evaluations of foul-release coatings," James Rudroff, E. Dail Thomas & James A. Ellor, 10th International Congress on Marine Corrosion and Fouling (incorporating 2nd U.S./Pacific Rim Workshop on Emerging Non-Metallic Materials for the Marine Environment), The University of Melbourne, Australia, 7-12 February 1999

J.A. Ellor, P.E., J.P. Ault, P.E., C. L. Farschon & J.P. Repp, "Coating Performance in Various Natural Environments and Accelerated Exposure," paper to be presented at SSPC 99, Houston, Texas

J.A. Ellor & C.L. Farschon, "Characteristic Corrosion/Coating Deterioration as a Function of Local Environments," Presented at SSPC 98

"Current Demand as a Result of Coating Void to Intact Coating Surface Area Ratio," J. Repp & J. A. Ellor, technical paper No. 312 presented at Corrosion 99, San Antonio, Texas, April 1999

"Maintenance Cost-Analysis with Protective Coatings/Linings," technical presentation at mid-Ohio NACE Corrosion Conference, 1997

"Allowable Soluble Salt Contamination Levels for Industrial Painting, J.A. Ellor and C. L. Farschon, SSPC 97-09, San Diego, CA, November 1997.

J.A. Ellor and L. A. Barker, "An Analysis of Flow-Induced Corrosion-Erosion in Piping Systems," 17th Annual Electrical Utility Chemistry Workshop, May 13-15, 1997, Champaign, IL

J. A. Ellor, K. Cramer, and J. Repp, "Novel Methods for Assessing Anti-Corrosion Coatings for Marine Structures," paper accepted for presentation at US-Pacific Rim Workshop on Emerging Nonmetallic Materials for the Marine Environment, Honolulu, HI, March 1997

"SSN-21 Corrosion Control Initiatives," technical report for NAVSEA 03M1, April 1996

J.A. Ellor, K. Evens, and J. Wright, "Hazardous Materials Reference System (HMRS4)," 1995 Aerospace Industries Association, Hazardous Materials Management Conference, September 1995

"Study, Investigation and Development of a Bridge Maintenance Painting Management Program," report for the Triborough Bridge and Tunnel Authority, N.Y., N.Y., August 1995

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"Guide to NAVSEA-Specified Coatings, Critical Environmental/Worker Safety Regulations and Regulatory Impacts," technical report for NAVSEA 03M1, March 1994

"Analysis of FCT ICCP System Operation Aboard USS MIAMI (SSN-755)," technical report for NAVSEA 03M1, February 1994

"Potential Impact of Environmental and Worker Health Laws on the Sacrificial Anode Life Cycle," technical report for NAVSEA 03M1, June 1993

Marine Paint Specification; Hazardous Material Study/Upgrade," technical report for NAVSEA 03M1, April 1993

"Evaluation of DDG ICCP Effectiveness," technical report for NAVSEA 03M1, October 1992

"A Review of VOC Compliance at NOS-Louisville," technical report for Advanced Systems Technology, Inc., May 1992

"Test and Evaluation of Alternative Paint Schemes for Support Equipment," technical report for SEMCOR, Inc., May 1992

"Corrosion of Nickel-Aluminum Bronze Exposed to High Velocity Seawater," J.A. Ellor, G.A. Gehring, and A.R. Parks,, paper No. 502 presented at CORROSION 191, Cincinnati, OH, 1991.

"Disbondment and Blistering Characteristics of Epoxy-Based Coatings Under Cathodic Protection in Seawater," J.A. Ellor and T.J. Marchesani, proceedings of SSPC 91, Long Beach, CA, 1991.

"Performance Testing of Indium-Activated Aluminum Anodes in Seawater," J.A. Ellor and B. Brinckerhoff, paper No. 6587 presented at 23rd Annual Offshore Technology Conference, Houston, TX, 1991.

"Evaluation of Selected Maintenance Coatings over Hand and Power Tool Cleaned Surfaces," J.A. Ellor, R.A. Kogler, and A.R. Parks, Journal of Protective Coatings and Linings, Vol. 7, No. 12, December 1990.

"Evaluation of Cavitation-Resistant Coatings for Use on Underwater Hulls," J.A. Ellor, presented at the NACE Northeast Regional Meeting, Baltimore, MD, 1989.

"Galvanic Corrosion of Copper-Nickel Sheathed Steel Piling," J.A. Ellor and G.A. Gehring, Materials Performance, Vol. 27, No. 5, May 1988.

"Performance Testing of Reformulated MIL-P-24441 Epoxy Coatings," J.A. Ellor, NAVSEA, Code 05M1 technical report, September 1988.

"Overcoating of Inorganic Zinc Primers for Underwater Service," G.A. Gehring and J.A. Ellor, Journal of Ship Production, Vol. 4, No. 4, November 1988.

"Evaluation of Powder Coatings for Shipboard Applications," J.A. Ellor, NAVSEA, Code 05M1 technical report, September 1987.

"Calcite-Type Coatings Applied to Segregated Seawater Ballast Tanks," J.A. Ellor, NSRP SP-3 Panel Meeting, New Orleans, LA, 1984.

J. Peter Ault, P.E.

Education/Qualifications

MBA, Drexel University, Philadelphia, PA
B.S., Mechanical Engineering, Drexel University, Philadelphia, PA
Licensed Professional Engineer
New Jersey #39403 New York #079314
Louisiana #29578 Kentucky #22469
Florida #59654 Alaska #10795
NACE Certified Protective Coatings Specialist #4348
SSPC Protective Coatings Specialist

Experience Summary

Mr. Ault has been actively involved in various aspects of corrosion control and materials engineering for over 17 years. Over his career he has worked on projects for the Army, Navy, and Marine Corps. He also has extensive experience in the highway, oil & gas, and water/wastewater industries. Mr. Ault has been in charge of research and development programs, field investigations, and construction projects. Selected technical experience includes:

U.S. Navy Directed over \$20 million in coatings and corrosion research projects for the U.S. Navy. Projects focused on development of data that supported materials selection decision that improved the service life (and decreased life-cycle cost) of U.S. Navy equipment. Project areas included:

- inhibitor technologies for use on various ship systems including fire and cooling water systems, inactive fleet preservation, and materials used for deck cleaning and preservation,
- alternative plating technologies,
- cathodic protection current demand in various flow regimes (including cavitation),
- performance of nickel aluminum bronze alloy in turbulent and laminar seawater flow,
- improved QA procedures for coatings,
- coating selection for turbulent seawater exposure,
- investigation of the effects of current interchange between dissimilar piping materials,
- performance of new-technology coatings (flame spray, powder, plural component, supercritical CO₂ technology, and 100% solids technology),
- specification development for shipboard and underwater hull coating systems,
- on-site QA of underwater hull coating application, and laboratory testing of anti-fouling coatings.

U.S. Army Over 10 years experience conducting corrosion-related research for various Army systems:

- Program Manager for the development of a Corrosion Durability test at Aberdeen Proving Ground for the validation of corrosion enhancements to the Family of Medium Tactical Vehicles (PM-FMTV). Worked extensively with APG personnel to develop facilities and procedures for testing.
- Program Manager for the development of an accelerated corrosion durability test for the evaluations of MTR.
- Program Manager for the development of an accelerated corrosion test protocol for PM-PAWS (Petroleum & Water Systems).
- Provided direct support to the Army Acquisition Pollution Prevention program since the late 1980's. Worked directly for the U. S. Army Materiel Command's Acquisition Pollution Prevention Support Office (AAPPSO) involving the evaluation of environmentally acceptable alternative metal coatings.

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- Served as Program Engineer in a multi-phased effort to implement non-chromate containing conversion coating processes at Red River Army Depot. The effort included identifying alternative processes, conducting laboratory evaluations of alternatives, prototype implementation of selected processes, and full scale implementation of the most effective alternative.
- Developed a tool for use by Army engineers for identifying the best possible environmentally-friendly alternative for cadmium plating. Distributed the tool Army wide.
- For the Tank-automotive and Armaments Command, performed test programs examining non-chromate sealers used on coatings, lubricious coatings applied over IVD Aluminum, and alternative materials for use on electrical connectors. Also evaluated in-service performance of vehicle parts and components coated with alternatives to cadmium plating.

U.S. Marine Corps Mr. Ault was a senior advisor for two MARCORSSYSCOM sponsored corrosion initiatives. The first initiative is for the development of a Corrosion Durability Test Procedure for Marine Corps vehicles. The second initiative is for the development of vehicle wash down system.

Highway Bridges Mr. Ault managed a number of Federal Highway Administration sponsored research projects with a cumulative value over \$3 million. Selected projects include:

- Principal Investigator on a project to evaluate the performance of steel culvert coating materials. Directed field inspection teams to survey various culvert installations. During the field inspections, both pipe condition and installation corrosivity were evaluated. The data was evaluated to project service life and determine environmental characteristics under which these predictions are valid.
- Project engineer in a Federal Highway Administration project designed to develop data for the application of impressed current cathodic protection to prestressed concrete bridge structures. Collected electrochemical data on full-size prestressed concrete beams.
- Project Manager for a Federal Highway Administration program to characterize various environments with respect to their corrosivity. The project included the development of equipment designed to monitor various atmospheric constituents. Nine field sites were selected for monitoring of atmospheric variables and material performance. Materials evaluated include uncoated weathering steel and six coating systems. The effects of geometry and exposure orientation were evaluated at each site.
- Project Manager in a Federal Highway Administration program to evaluate powder coatings for the corrosion control of highway structural components. The test program included evaluation of alternative powder coating materials to protect concrete reinforcing bars. Responsible for all technical aspects of the program including coating application, testing, and evaluation. A comprehensive report and users guide was published on the basis of the research and testing performed.
- Supervised data acquisition on test samples exposed as part of a Federal Highway Administration program evaluating various sacrificial anode materials for reinforced and prestressed concrete bridge structures. Participated in the design of the test specimen and directed their exposure and monitoring at two test sites adjacent to Corpro's laboratory.
- Participated in a Federal Highway Administration program to evaluate environmentally acceptable coating materials for bridge structures.
- Principal Investigator for FHWA research project titled Adhesion Criteria Between Water-Based Inorganic Zinc Coatings and Their Topcoats for Steel. The project was a pooled fund study investigating the possible causes of water-based inorganic coating failure. The effects of environmental conditions, substrate salt contamination, improper zinc content, and effects of primer aging on various observed failure mechanisms.
- Performed related research for CalTrans that investigated the effect of primer aging on topcoat performance. The program resulted in data allowing a revision of CalTrans specifications.

Mr. Ault managed multiple simultaneous bridge paint inspection contracts with a total value in excess of \$2 million annually. Responsibilities include overall administrative coordination, as-needed technical assistance, periodic project audits, and coordination of staff assignments. He regularly visits major project work sites for quality audits and involvement in special assignments. Selected projects include:

- The Marine Parkway Bridge in New York City – Involves work on lift towers over active roadways protected with shielding.
- The Quebec Bridge near Montreal Canada – Involved repainting of significant trusswork over active roadways protected with shielding.
- The Bayou Lafourche Bridge in Louisiana – A lift tower bridge with work conducted over active traffic utilizing protective shielding.
- Program manager in an effort to develop a bridge maintenance painting strategy for the Triborough Bridge and Tunnel Authority (TBTA) – Involved developing inspection techniques and coordinating field inspections of the nine bridges and tunnels under the jurisdiction of TBTA. Responsible for data analysis and the development of a long-term maintenance strategy, which addresses the issue associated with bridge maintenance painting.

Pipe Conducted numerous studies of alternative pipe materials.

- Directed laboratory investigations of the coating material on a 70-year old water main. His studies demonstrated that the coating retained sufficient dielectric strength and other material properties to provide additional service life. Field studies investigating pipeline condition and coating adhesion confirmed its integrity.
- Project Manager for the condition assessment of two 16-inch gas lines under the tenth Avenue Bridge in Minneapolis. Oversaw the inspection, conducted follow-up inspections with Minnegasco and OPS personnel, and presented the inspection results as well as recommended remedial action to Minnegasco and OPS personnel.
- Developed simulation test protocol for the evaluation of Corrugated Steel Pipe (CSP) coatings for an industry consortium. The project included assessing standard test methods by ASTM, AASHTO, and other agencies. The more relevant of these test methods formed the basis for screening coatings to be tested in the simulation test rig. Concurrently, a simulation test rig was developed to expose fabricated pipe to environments representative of service conditions. This test rig is currently operated by Corpro to evaluate new coating materials for use on corrugated steel pipe.
- Provided expert advice to a major western gas transmission and distribution company contemplating legal action regarding failure of fusion bonded epoxy pipeline coating.
- Evaluated a plural component urethane for use on the interior of corrugated steel pipe. The evaluation included an assessment of the application procedures and obstacles to application peculiar to the manufacture of corrugated steel pipe. In a related effort, he was the principal investigator evaluating the performance of a variety of coating materials (including the plural component urethane) on the interior of corrugated steel pipe. The testing included industry standard tests as well as custom designed performance tests.

Selected Technical Publications:

"Evaluation of Water-Based Inorganic Zinc Curing Under Various Environmental Conditions," J.P. Ault, Dr. S. Chong, C.L. Farschon, and M. Hamilton, Paper presented at the Fifth World Congress on Coating Systems for Bridges and Steel Structures, University of Missouri-Rolla, February 1997.

"Guidelines for Repair and Maintenance of Bridge Coatings: Overcoating," C.L. Farschon, R.A. Kogler, and J.P. Ault, August 1997, FHWA-RD-97-092, 95 p.

"Characterization of the Environment for Weathering Steel Design Considerations," J.P. Ault, C.L. Farschon, and R.A. Kogler, Paper presented at the Fourth National Workshop on Bridge Research in Progress, Buffalo, NY, June 1996.

"Performance of Thermally Applied Organic Coatings in a Marine Atmosphere," J.P. Ault and C.L. Farschon, *Materials Performance*, February 1996, Volume 35, Number 2, pages 51-55.

"Corrosion Control of Highway Structural Components by the Application of Powder Coatings", J. Peter Ault, Christopher L. Farschon. FHWA-RD-94-175, Federal Highway Administration, Washington, D.C., June 1995.

"Environmentally Acceptable Materials for the Corrosion Protection of Steel Bridges", J. Peter Ault, Christopher L. Farschon, and Robert A. Kogler. FHWA-RD-96-058, Federal Highway Administration, Washington, D.C., 1996.

"Durability of Culverts and Special Coatings", J. Peter Ault, Federal Highway Administration, Washington, D.C. January, 2000.

J.A. Ellor, J.P. Ault, and K. O'Brien, "Evaluation Methodology for Corrugated Steel Pipe Coating/Invert Treatments," NCSPA Annual Meeting, Key Biscayne, FL, 1996

"Extreme Value Analysis of Pitting Corrosion," J.J. Meany, J. Peter Ault, Jr., Proceedings, Life Prediction of Corrodible Structures, 3rd NACE International Relations Committee Symposium, Cambridge, UK, Sept 1991.

"A Test of the Reliability of Mathematically Modeling of Corrosion," J. Peter Ault, Jr., J. Meany, Jr., Proceedings, Corrosion Control for Low-Cost Reliability, 12th International Corrosion Congress, Houston, Texas, September 1993.

Cramer, Keith and J. Peter Ault, "Comparison of Aluminum Coatings Provided by Electroplating and Ion Vapor Deposition to Other Cadmium Alternative Materials", U.S. Navy & Industry Corrosion Technology Working Group Conference, July 1997.

"Exposure Testing of Environmentally Acceptable Coatings for U.S. Navy Ground Support Equipment," T.J. Marchesani, J.P. Ault and C. Fitch, Proceedings, Tri Services Corrosion Conference, May 1992.

"Performance of Thermally Applied Organic Coatings in a Marine Atmosphere," J. Peter Ault and Christopher L. Farschon, presented at CORROSION/95, National Association of Corrosion Engineers, Houston.

"Statistical Analysis of Pitting Corrosion in Condenser Tubes," J. Peter Ault, George A. Gehring, *Corrosion Testing in Natural Waters, Second Volume*, ASTM STP 1300. ASTM, W. Conshocken PA., 1996.