What Is Really Important

On October 27th we were notified of the passing of Mr. Alex Wijaya. Many of you may not know Alex, but he was an exceptional supporter of SSPC in Asia, especially in Indonesia and Singapore. Alex was a young man who had an unbelievable work ethic and drive to succeed. I always told Alex that he smoked too much and never got enough sleep. He would answer e-mails at all hours and always had numerous jobs for many clients. When I told him he worked too hard and should spend more time with his wife, he would tell me that they would go to the movies on Sundays. She liked horror movies and he would sleep. But she was happy because they did that together. He taught many SSPC courses in that part of the world and did an outstanding job, not only teaching but also promoting SSPC. We recognized his efforts at last year's annual meeting when we presented him with one of two SSPC Education Awards. When I went to the last two Indocoating meetings in Jakarta, Alex was my "personal" escort. He took me everywhere, ensuring my every need was met. He showed me around Jakarta and the island of Java. Like all of us, he was very proud of his country and was anxious to show me all it had to offer. There was no better tour guide and promoter of tourism for Indonesia. He always pushed me to bring my wife to Indonesia and to visit Bali. It was in Bali that Alex passed away.

During the Indocoating shows, I do not think I met a single person who did not know and like Alex. We would also receive e-mails from individuals in India, Pakistan, the Philippines, and Dubai, all of whom knew Alex. Alex's untimely death hit all of us in Pittsburgh very hard. He had not only become an avid supporter of SSPC, but he had become our friend. As I wrote to the person who notified us, if there were more Alex Wijayas in the world, we would have no conflicts. Alex was a young man, taken from his family too soon. He leaves behind a wife and many friends around the world who will miss him dearly.

I also ask that you take a minute to give your thoughts and prayers to Eric Kline. Eric has worked for more than 25 years at KTA-Tator and is well known throughout the coatings industry. If there is an SSPC member in the U.S. who does not know or has not heard of Eric Kline, I have not met them. Eric, an avid supporter of SSPC, is fighting some health issues. He was presented SSPC's Honorary Life Member Award at last year's annual meeting. He has also been awarded the 2003 John D. Keane award, the 1997 Coatings Education Award, and the 2008 *JPCL* Editor's Award. I remember being at a steel bridge meeting where the speaker was not giving our industry the credit Eric thought it warranted. He stood right up and said, "You should not trivialize coatings." I will never forget that.

I was talking to a Past President of SSPC the other day about coatings issues that always seem to get everyone's "hair on fire." The issues themselves are not worth mentioning here. I just said to him that it seems when anyone mentions certain subjects, battle lines are drawn and disagreements seem to escalate more than necessary. The Past President said that these subjects could be talked about and probably resolved without all the emotion. I am one of those folks who wear my emotions on my sleeve and I sometimes operate in the "fire, ready, aim" mode. I hope the next time my blood pressure begins to rise that I will think about Alex and his untimely passing and Eric and his health issues, and then stop, count to ten, and move on. I don't know how many times each of us has been told that life, family, and health are the most important things we have. Have we actually listened, or does the passion for what we do overload our common sense? This is an area I have to consciously work on and remind myself not to get excited. If I lapse, remind me again of the priorities I should have.

Bill Shoup
Executive Director, SSPC

Q-Lab VP Dies; Was Leader in Testing

Patrick J. Brennan, 60, vice president of Q-Lab Corporation in Westlake, OH, died September 20, 2009, according to an October 14 announcement from the test equipment and services company.

During his 30-year career at Q-Lab, Mr. Brennan established himself as one of the few experts in the field of accelerated weathering and lightfastness testing, said Q-Lab President Douglas Grossman, who described Mr. Brennan's extensive activity in key standards-writing organizations, including ASTM International, the International Organization for Standardization (ISO), and the American Association of Textile Chemists and Colorists (AATCC).

Patrick J. Brennan

An ASTM member since 1986, Mr. Brennan participated in the association's committees on metallic coatings, B08; sealants, C24; paint and coatings, D01; road and paving materials, D04; roofing, D08; textiles, D13; plastics, D20; building materials, E06; corrosion, G01; and weathering, G03. Mr. Brennan also served on more than 50 sub-committees, was the D20.50 sub-chairman from 1991-2006, and was honored with the D20 Award of Appreciation in 2000 and the G03 Group Chairman of the Year Award in 2001.

Mr. Brennan was an active member of AATCC for 23 years, participating in several of its research committees and serving on the International Test Methods Committee. He was instrumental in changing Test Method 16, Colorfastness to Light, to a performance-based standard. He was former chair of the committees on Weather Resistance Test Methods and on Colorfastness to Light Test Methods. In addition, he served for several years as the U.S. expert for the ISO committee on light-stability and weathering. He was also a member of ISO TC38 for textiles, and ISO TC61 for plastics from 1992-2005.

Mr. Brennan started his career at Q-Lab working on the Q-Panel assembly line. Later, as the leader of Sales and Marketing at Q-Lab, he oversaw the initial launch of the Q-Fog Cyclic Corrosion Chamber (1993); Florida and Arizona Weathering Research Service (1995); and Q-Sun Xenon Test Chamber (1998). Over the past quarter century, he also oversaw the global expansion of Q-Lab into more than 60 countries, including China and Germany.

Mr. Brennan published numerous technical papers on weathering and lightfastness, and he taught audiences around the world. His contributions to the science of weathering and light stability have been immeasurable, Mr. Grossman added.

Carboline to Own 80% of Indian Venture

RPM International Inc. (Medina, OH) has announced that its Carboline subsidiary has acquired a majority interest in its Indian joint venture, CDC Carboline India Pvt. Ltd. Terms of the transaction were not disclosed.

Based in Chennai, India, CDC Carboline India manufactures corrosion protection and fireproofing products predominantly for the petrochemical, power, fabrication, and commercial and industrial fireproofing markets. The company has annual sales of approximately $8 million.

As a result of this transaction, St. Louis, Missouri-based Carboline, which is part of RPM's Performance Coatings Group, will own an 80% majority position in CDC Carboline India. The company's founder, Daniel Chittayagam, will retain 20% ownership and remain as managing director.

RPM International Inc., a holding company, owns subsidiaries that provide specialty coatings, sealants, building materials, and related services for the industrial and consumer markets.

Additional details are available at www.rpminc.com.

ASTM Updates B117 for Salt Spray

ASTM B117-09, Standard Practice for Operating Salt Spray (Fog) Apparatus, has been updated. The standard covers the practice of using a controlled corrosive environment to produce relative corrosion resistance information for metals and coated metals in a test chamber.

According to ASTM, correlation and extrapolation of corrosion performance based on exposure in a test environment are not always predictable and should be considered only in cases where appropriate corroborating long-term atmospheric exposures have been conducted.

The reproducibility of results in the salt spray exposure is highly dependent on the type of specimens tested, the evaluation criteria, and control of the operating variables. ASTM notes that variability has been observed when similar specimens are tested in different fog chambers, even when testing conditions are similar, so sufficient replicates should be tested to establish variability.

Worker Dies from Fall at Bridge Site

An abrasive blaster at a bridge job near Pittsburgh, PA, fell to his death after one side of the swing scaffold he was working from broke, according to Frank Librich, assistant area director for the Pittsburgh Area Office of the Occupational Safety & Health Administration (OSHA).

Michael L'Hereaux, 54, of Oberlin, OH, was working on the McKees Rocks Bridge on October 1 when the accident occurred, according to Dr. Edward Strimlan, chief forensic investigator for the Allegheny County (PA) Medical Examiner's office. The accident occurred at approximately 2:15 p.m., Dr. Strimlan said, and Mr. L'Hereaux was pronounced dead at the scene at 2:22 p.m.

Mr. L'Hereaux fell approximately 125 feet to the ground, according to Mr. Librich. No one else on the site was injured. OSHA is investigating the accident and has up to six months to complete its investigation, he said. OSHA does not release details of an investigation before it is complete, he added.

Mr. L'Hereaux had been working for Odyssey Contracting Corp. (Houston, PA) on the $6.8 million rehabilitation project for the McKees Rocks Bridge, according to James B Struzzi II, communications officer for Engineering District 11 of the Pennsylvania Department of Transportation.

According to Odyssey owner Stavros Semanderes, Mr. L'Hereaux, who had been on the job for Odyssey for a month, was not a permanent employee of the company but had approximately 30 years of experience in the painting industry.

Falls are the leading cause of death among painters, according to the Bureau of Labor Statistics.

OCCA Awards President's Medal

The UK's Oil & Colour Chemists Association (OCCA) has awarded this year's President's Medal to Peter Davys, managing partner of Orrest Business Solutions.

On behalf of OCCA, Outgoing President Len Jennings gave Mr. Davys the award for his contributions to the association and the coatings industry in general. As an active committee member of the OCCA Manchester Section, Mr. Davys has been heavily involved in the development of training plans within the coatings industry; the development and expansion of the OCCA Manchester Section; and the continuing success of Surfex, the UK exhibition for the surface coatings, printing inks, adhesives, corrosion, and construction communities, according to Orrest.

Mr. Davys has worked for more than 25 years in the chemical industry.

Bayou to Acquire Canadian Pipe Coating Plant

The Bayou Companies, Inc. (Bayou), a subsidiary of Insituform Technologies, Inc., has announced its agreement with Garneau, Inc. to acquire Garneau's pipe coating and insulation facility and associated assets in Camrose, Alberta, Canada.

Garneau's shareholders are expected to vote on the agreement, which has been approved by its Board of Directors, in late October 2009. The transaction is expected to close on or before October 31, 2009.

Bayou Perma-Pipe Canada, Ltd., a joint venture between Bayou and Perma-Pipe, Inc., will acquire the Garneau facility and assets, and will serve as the operating company for Bayou's Canadian operation. Bayou is based in New Iberia, LA, and provides pipe coating, fabrication, and logistics capabilities to oil and gas companies in the Gulf of Mexico.

Bayou's joint-venture partner, Perma-Pipe, manufactures pre-insulated district heating and cooling piping systems in North America as well as pre-insulated products for subsea oil and gas gathering, related structures, and long distance petroleum pipeline transportation.

Insituform Technologies (Chesterfield, MO) is a worldwide provider of proprietary technologies and services for rehabilitating sewer, water, energy, and mining piping systems and for the corrosion protection of industrial pipelines.

For more information, visit www.bayoucompanies.com.

Checking Abrasives in the Field

Many SSPC and ISO standards can be used in the laboratory to check the quality of abrasives, including particle size, moisture content, and contamination. However, what are the most important quality checks to be carried out in the field when using new abrasive?

David Dorrow, Mineral Aggregates Inc.

Purchasing an abrasive from a reputable manufacturer—one who has run the gauntlet of qualification testing performed by a third-party certified lab—is the first step in the quality control process.

An experienced and alert set of eyes can be the consumer's next line of defense. Training employees to visually inspect abrasive and to diligently collect and review samples from each load is essential for jobsite quality control. When a bulk load of material is pneumatically being conveyed into a bulk storage hopper, is there a plume of dust rising into the sky? If the abrasive is generating dust during low pressure unloading, it will generate a lot of dust during high pressure blasting, causing poor visibility and decreased productivity.

Has a standard abrasive sample been kept from the start of the job to which all future samples can be visually compared? Has a sample been kept from each subsequent load for visual reference?

When samples are collected, one visual change to look for in an abrasive is a slight change in color. For instance, a sand abrasive may change from white to beige, while a slag abrasive may change from black to amber or green, indicating a potential change in product quality. Bulk density, hardness, and friability changes are most evident when color changes.

A simple test can be performed on the jobsite to check for oil contamination on an abrasive. Use a clean, uncontaminated scoop or hand trowel to collect a representative sample of the abrasive and place the abrasive sample into a glass of water. Look for a "shiny" oil slick to appear on the surface of the water, signifying oil is present on the abrasive.

This same abrasive sample and cup of water, along with a simple, inexpensive, pocketsize conductivity meter, can be used to test for non-visible contaminants like chlorides and sulfates. This concern is more significant for abrasives that are processed near the coast, as they may have been washed or quenched in brackish water or contaminated during transportation by barge on the Intracoastal Waterways. If you experience flash rusting on a freshly blasted steel surface, it is either from the chlorides on the abrasive or from preexisting chloride contamination on the steel surface.

Customers should also visually check the abrasive for impurities and contamination that can come either from the manufacturing process, the raw material, or the transportation and delivery system. While on the jobsite, a worker can easily use two quarters (or other coins) to test the friability of the impurities by rubbing a few granules between the quarters.

Mined or by-product abrasives typically contain impurities, but the important factor is that the impurities are as hard and inert as the abrasive material. Soft, friable impurities in an abrasive, on the other hand, may smudge on impact and visually spot the surface. This spotting is a concern for coating adhesion. If the abrasive contains impurities to the extent that you see the surface being contaminated during blasting, contact the manufacturer or look for a different quality abrasive.

The "quarter" test can also be used for evaluating the friability of the abrasive granules. However, this test should be viewed as only a general one for friability, as the pressure one applies to begin crushing the abrasive particles may not be consistent.

A visual inspection of the abrasive can reveal significant changes in the product gradation or operating mix; however, having a set of sieves on site to check the abrasive gradation or operating mix is useful. A sieve is an 8" or 12" round pan that has screen wire with specific size openings stretched across the bottom that can easily retain the varying sized abrasive particles. At a minimum, the abrasive should be checked with a maximum sieve size and a minimum sieve size to assure that the specific abrasive size that was selected is the same one that was delivered. A pot screen with ¼-inch openings is a

David Dorrow is the President of Mineral Aggregates Inc., a company that focuses on developing value-added marketing solutions for mineral co-products. He has participated in the SSPC Abrasive Steering Committee and the SSPC Surface Preparation Steering Committee, as well as the Development Committees for SSPC AB1 Mineral Abrasive Specification.

must on all blast pots to catch large contaminants and oversized abrasive particles, eliminating potential downtime needed to clean out a blocked pot or nozzle.

The value of a diligent employee committed to quality verification cannot be overestimated and will go a long way in reducing on-site abrasive problems.

Bud Budzinski, Reed Minerals

In most cases, a quick inspection of the abrasive before blasting can identify problems before they cause delays. Below are several quality checks that can be performed easily on abrasive materials before blasting.

• *Confirm the material type and amount.* Is the abrasive material on site the correct product? Don't rely on product labeling; visually check the material before use. Do you have enough material to complete the job? Inventory your material and order additional material before you run out.

• *Product certifications.* If a job requires the abrasive material to have a specific certification, check the shipping paperwork for this designation. In some cases, additional documentation is required and should be obtained before beginning a job to avoid being shut down upon inspection.

• *Moisture.* Did the material arrive in good condition? Inspect the packaging for rips or punctures that could allow moisture to penetrate the packaging and, ultimately, the material. Bulk bags that have been improperly stored can absorb moisture from the top as well as wick moisture from the bottom. Damp or wet material will flow poorly and will clump in your hand when squeezed.

• *Material contamination.* Whenever possible, examine the material for contamination before use. Always place a screen over your blast pot opening to catch any oversize granules.

• *Material additives (liquid).* If the abrasive was ordered with a liquid additive such as dust suppressant, the abrasive should be noticeably less dusty when handled and may even have a slight odor. Check if the dust suppressant was over applied by taking a handful of abrasive and squeezing it in your hand. If the abrasive clumps or sticks to your hand, it may be over-oiled.

• *Material additives (granular).* It may be necessary to use abrasives that contain granular additives such as heavy metal neutralizers. In most cases, these additives can be distinguished from the actual media by their size and color. If you are not sure if the product contains the necessary additive, contact your product sales representative or distributor before use.

• *Conductivity/chlorides.* Soluble salts, especially chlorides that remain on

blasted surfaces, contribute to flash rusting and coating failures. These salts are found on the surface of certain types of abrasive granules and can leave a residue following blasting. Look at your abrasives closely; sometimes the salts can be seen on a granule's surface and appear as a white residue. Otherwise, blast a small area and test the surface using a portable field chloride tester before proceeding.

Anthony (Bud) Budzinski joined Reed Minerals in 1997. His main responsibilities include quality control and research and development. He also provides technical customer support.

Jeroen Keswiel, EUROGRIT BV

One of the most important on-site quality checks of abrasives is the conductivity test. This can be done in two ways, both described in ISO standard 11127.

For testing the abrasive in the field, determination of water-soluble contaminants by conductivity measurement (ISO 11127-6) is the most appropriate method, as it is a relatively simple procedure and no chemicals are needed. You only need a conductivity-measuring bridge and conductivity cell, together with some glass sample flasks and demineralized water. Determination of water-soluble chlorides per ISO 11127-7, however, cannot be done in the field because a laboratory setting is needed to handle the chemicals and procedures involved in the test.

ISO standard 11126 prescribes the limits on conductivity and water-soluble chlorides of each abrasive.

Hardness can also be tested in the field with a glass-slide test, but this may not really be necessary. Hardness will be tested once in a while in a lab or in the office; the test can easily be done in the field, but, normally, most abrasives are quite stable in hardness and the need for on-site testing is reduced.

Grain size distribution and moisture are more difficult to test in the field. For the sieve analysis, you need either a digital imaging particle size/shape analyzer or a number of test sieves with a "shaker," which makes it more difficult to do in the field. The moisture test also requires equipment that is not really portable. Normally, grain distribution and moisture are tested in a laboratory, where the necessary equipment is located.

Jeroen Keswiel has been an Area Export Manager for EUROGRIT BV (Papendrecht, The Netherlands) since November 1996.

Copper Mine Gets New Support

By David E. Snider and Heather M. Ramsey, Sauereisen Inc.

A large copper mine and refinery in the western United States had a dilemma. The mine's cell house, which contains over 1,500 cells, each holding more than 20,000 gallons of electrolyte, had exhibited severe corrosion and structural degradation of the concrete support columns for the tanks. Over time, highly acidic leakage from the cells (primarily copper sulfate and 25% sulfuric acid at a pH of 1.0 or less) had caused the support columns to deteriorate and the No. 8 reinforcement bar (rebar) to corrode. Rebar corrosion increased internal pressure because the corrosion products expanded, putting the concrete in high tensile stress to the point where its ability to adequately withstand the imposed load was in doubt. The direct effect of this stress was cracking and spalling of the concrete (Fig. 1).

Fig. 1: Typical column degradation. Photos courtesy of the authors.

Fig. 3: The forms placed around the column

Restoration Project

The original construction of the columns used No. 8 rebar spaced 6 inches on center vertically and 18 inches on center horizontally. The refinery's standard repair procedure was to remove corrosion products, including deteriorated concrete, from the concrete and steel and then to top them with a polymer-modified portland-cement mortar. This standard repair method requires two to three days per column, and although temporarily effective, it did not meet the company's desire for a long-term solution, as the refinery desired to upgrade the facility's ability to withstand seismic activity.

The company decided upon a new approach, using a polymer concrete (PC) designed for maximum flowability, mechanical properties, and chemical resistance. The PC repair system (a bisphenol A epoxy-based material) uses the polymer concrete for encapsulation, chemical protection, mechanical support, and resistance to physical abuse.

The specification for this project was developed by the PC manufacturer's field engineer and the facility's maintenance engineer. The specification development considered cost, ease of installation, downtime, engineering parameters, and corrosion control. The specification also called for a seismic evaluation, which was conducted by the manufacturer of a fiberglass-reinforced plastic (FRP) system also used in the repair. The facility's local preferred contractor performed the work.

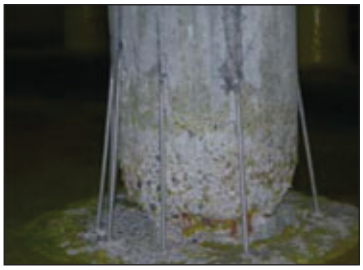


Fig. 2: Stainless steel rebar bent and grouted into the channels

Fig. 4: Pouring of the polymer concrete

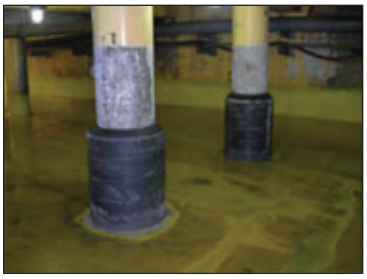


Fig. 5: Columns after removal of forms

To begin the restoration project, new stainless steel rebar was embedded into the concrete floor using an epoxy mortar. Channels were saw-cut vertically in the concrete column. These channels provided a recess into which the rebar was bent and then secured into place with the epoxy mortar (Fig. 2). Grouting of the rebar with this high-strength epoxy mortar also served to provide tensile stress relief. Lowering stress relief reduced corrosion rates. (The previous repair method did not include installing rebar into the floor to reinforce the material. The original rebar in the columns was mild steel.)

To further ensure structural integrity and to upgrade seismic capabilities, the company chose to use FRP strips and wraps under the PC. The strips were installed vertically on the columns, and a fiberglass fabric was wrapped around the columns horizontally. The columns were formed and the polymer concrete was poured into place, completely encapsulating the columns, the rebar, and the FRP (Figs. 3, 4, and 5). This method required two days per column. To date, 75

Continued

Editor's Note: This article is based on a paper presented at PACE 2009, the joint conference of SSPC and PDCA, held February 15–18, 2009, in New Orleans, LA.

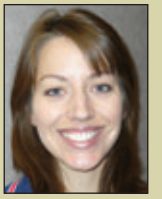
Fig. 6: Completed column repair

columns have been repaired using this method.

The use of protective coatings to give the necessary chemical protection to the repaired concrete was rejected, because, although these coatings typically have a service life of 8 to 15 years in many settings (depending upon the exposure and physical abuse), in this environment, their typical service life is six months. Their service life is also affected and somewhat limited as a result of application thickness, which generally ranges from a few mils to a few hundred mils. Polymer concretes, however, are applied from 1 to 18 in. thick. The thickness of the barrier determines the overall permeability, which is a measure of water vapor's ability to pass through a material and corrode the rebar. Also, a PC requires far less maintenance. The manufacturer reports that the PCs it has used have not failed after 15 years of service. Laboratory evaluations coupled with field observations indicate the service life of PCs to be typically greater than 25 years.

Figure 6 illustrates the completed column, including a protective topcoat for the FRP reinforced concrete. Although not needed for functionality, the topcoat was extended over the PC for aesthetics and coating integrity.

The columns have been inspected twice to date and are in excellent condition.



Heather M. Ramsey, chemist for Sauereisen, Inc., is involved in the research and development of both inorganic and organic corrosion-resistant materials as well as technical cements. She is a member of SSPC, Federation of Societies for Coatings Technology (FSCT), ASTM, and the American Chemical Society (ACS).

David E. Snider is the western regional manager for Sauereisen, Inc. (Pittsburgh, PA) and has 27 years of experience in the field of corrosion-resistant materials of construction. Snider has held positions in R&D, technical service, and sales.

Defendants in Painters' Deaths Get Extension

By Karen A. Kapsanis, *JPCL*

Defendants facing criminal charges in the deaths of five painters at a hydroelectric plant were granted a motion on October 23, 2009, for more time to prepare for trial, according to Jeffrey Dorschner, press officer for the U.S. Attorney's Office in the District of Colorado. All charges except one are misdemeanors. No trial date has been set.

The painters died October 2, 2007, while trying to escape a fire that started in a penstock they were relining for the Cabin Creek Hydro Plant near Georgetown, CO. The painters were employees of RPI Coating Inc. (Santa Fe, CA). Minnesota-based Xcel Energy and Public Service Company of Colorado, which is part of Xcel, operate the hydroelectric plant.

Background on the Case

RPI, its president Philippe Goutagny, its former vice president James Thompson, Xcel, and Public Service Co. of Colorado were indicted August 27, 2009, in the deaths of Gary Foster, Don DeJaynes, Dupree Holt, Anthony Aguirre, and James St. Peters. The indictment was filed in the U.S. District Court for the District of Colorado. All defendants pleaded not guilty.

According to the indictment, the penstock fire began when vapors ignited from the solvent, methyl ethyl ketone, which the painters had on site to clean their spray equipment; their escape route was blocked; and they died of asphyxiation.

The indictment alleges that the defendants willfully violated Occupational Safety & Health Administration (OSHA) regulations on permit-required confined spaces and other hazards, which resulted in the deaths of the painters. Each defendant faces five misdemeanor counts, one for each death. If convicted, each company could face a maximum penalty of $500,000 per count. If convicted, Mr. Goutagny and Mr. Thompson could each face a penalty

up to $250,000 per count or a prison sentence up to six months per count, or both, according to the indictment.

RPI alone was indicted on a sixth count, obstruction, which is a felony. The indictment alleges that the company "knowingly altered, destroyed, concealed, and covered up records, documents, and tangible objects... with the intent to impede, obstruct, and influence the investigation." If convicted on the count, RPI faces an additional penalty of up to $500,000.

Recent Motion Extends Trial Prep Time

Attorneys for RPI, Mr. Goutagny, and Mr. Thompson filed a motion, unopposed, on October 12, 2009, to have the case declared complex under the Speedy Trial Act (18 USC §316(h)(8), according to the court docket. The October 23 court action granting the motion allows all of the defendants more time to prepare for trial than typically allotted, said Mr. Dorschner.

Mr. Thompson's attorney, David Kaplan, of the Denver firm Haddon, Morgan, Mueller, Jordan, Mackey & Foreman, P.C., said of the declaration, "I think it was a designation that we felt applied, as did the government, given both the complexity of the regulatory scheme, the factual circumstances, and the number of documents created in the government's investigation. To adequately prepare to answer the allegations, we wanted to make sure we had sufficient time, which is what the complex designation provides."

Separate OSHA Fines in Litigation

OSHA, in March 2008, proposed its own penalties of $845,100 against RPI and $189,900 against Public Service Co. of Colorado, dba Xcel Energy, for alleged serious and willful violations of OSHA standards after the painters' deaths. The companies appealed the citations; the OSHA penalties are in litigation, according to Jeremy Eggers of the Denver OSHA area office.

Coating Failures on Galvanized Mast Arms

By Paul Vinik, MSChE, P.E., Florida Department of Transportation
and Richard A. Burgess, B.S, M.S, KTA-Tator, Inc.

The next time you pull up to an intersection with traffic signals look for the mast arms that support them. Are the arms galvanized, concrete, aluminum, or painted? Painted mast arms may have had the coating system applied directly to blast cleaned steel or over hot-dip galvanized steel (a duplex system). This article discusses the failure of coatings applied to galvanized mast arms for the Florida Department of Transportation (FDOT); analysis of the failure, including key background information on galvanizing; the findings; and the approach FDOT implemented to correct failing galvanized mast arms exhibiting corrosion.

Florida Experience

FDOT identified 60 coated and galvanized steel mast arms in the Jacksonville, FL, area as having paint (coating) peeling from galvanized steel. Consultants were engaged to investigate the failures in 2004. Nearly two-thirds of the mast arms under investigation were in service for only two years. Records indicated that six of the failed mast arms were included in construction projects from 1997 through 2001.

The Investigation

Clearly, the performance was significantly less than expected. Initial examination of the mast arms in November 2004 found that the failed coating systems had intact blisters filled with corrosion products (without free moisture) and the same type of corrosion products were present where the coating had cracked and peeled. The corrosion products under the coating film were typically soft and pasty. Exposed corrosion products easily crumbled and contained zinc and iron. Examples of the conditions, shown in Figs. 1, 2, and 4, demonstrate the degree of failure and that these failures were clearly visible to the traveling public. Several surface conditions are shown in Figs. 3, 5 (p. 22), 6 (p. 22), and 7 (p. 23).

Factors in the Analysis

Understanding how hot-dip galvanizing corrodes and how to prevent corrosion was essential to the analysis.

Hot-dip galvanizing of steel results in a shiny metallic zinc surface and several alloyed layers with the lower layers having decreasing zinc content. The finish is often spangled as a result of alloy and cooling properties, but spangling becomes less obvious as the surface weathers and changes color.[1] From the time steel is removed from the molten zinc bath, the zinc surface can be classified into one of three aging stages: newly galvanized, partially weathered, or weathered.

Newly galvanized surfaces are essentially zinc metal. However, zinc is relatively reactive, and chemical changes occur quickly at the surface. Zinc reacts with oxygen in the air, forming zinc oxide, ZnO. Thus, even newly galvanized structures will have some ZnO present on the surface. Over time, a surface reaction between moisture and ZnO forms zinc hydroxide, $Zn(OH)_2$. $Zn(OH)_2$ reacts with carbon dioxide (CO_2) in the air to form basic zinc carbonate ($ZnCO_3$).

A partially weathered zinc surface consists primarily of

Fig 1: Coating peeling from the post and horizontal arm of a galvanized mast arm. The exposed surfaces contain white and red corrosion products. Photos courtesy of the authors

Fig 2: Peeling coating on the underside of the horizontal section of a galvanized mast arm.

zinc oxide and zinc hydroxide with lesser amounts of zinc carbonate. The zinc oxide and hydroxide yield porous films that provide little protection to the zinc surface. ZnO and $Zn(OH)_2$ continue to form as long as oxygen and moisture are available. Zinc carbonate content in the film typically increases until the film covers the surface, and the surface film takes on a dull gray color.

Depending on climate and exposure, the full weathering process can take from six months to two years. Zinc carbonate, insoluble in water, forms a very protective film at the surface. Even so, the galvanizing can still corrode. Airborne pollutants, particularly sulfur dioxide (SO_2), that contribute to acidic moisture can dissolve the $ZnCO_3$ layer, exposing metallic zinc and allowing corrosion to continue. Consequently, galvanizing performs best under neutral atmospheric conditions. Even so, the zinc-rich surface will eventually be depleted in aggressive environments in as little as a month but can last for decades in mild environments. As the zinc surface layer is lost, the zinc-iron alloy layers will be exposed and corrode. The corrosion products change color, from white-gray to a pale rust, and then to deeper shades of rust, as the iron (steel) substrate is exposed.

Fig 4: A close view of the surface beneath peeling paint on the underside of the mast arm in Fig. 2. The galvanizing is depleted and the steel substrate is corroding.

Coating Galvanizing

Organic coatings are used to protect galvanizing and steel from aggressive environments and to provide color as well as extend service life in milder environments. Coating manufacturers and trade associations such as the American Galvanizers Association (AGA),[2] SSPC: The Society for Protective Coatings (SSPC),[3] and NACE International (NACE)[4] provide guidance for preparing and coating galvanized structures. ASTM International[5] (ASTM) addresses the use of coating to repair new galvanizing in ASTM A 780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings, and ASTM D 6386, Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting. The latter document includes recommended practices for preparing new galvanizing, partially weathered galvanizing, and weathered galvanizing.

Fig 3: Appearance of failing coating on the side of a horizontal arm.

Surface Preparation

Removing grease, oil, and dirt is necessary before painting any surface, including galvanizing. Additional requirements for galvanizing include avoiding water quenching and chromate treatment to protect against white storage stain, which frequently follow the galvanizing process.[6] If these practices cannot be avoided, the surface films they create must be removed because they inhibit coating adhesion. Surface smoothing of the galvanizing is also necessary, particularly where liquid zinc run-off or other galvanizing byproducts are present. Otherwise, the rough surface texture, like rough welds on steel, contributes to discontinuities in the subsequently applied coating film. Further, unlike steel where tightly adhered rust (iron oxides) may be allowed to remain,[7] the oxide and hydroxide corrosion products of zinc are weak and loosely adherent. They must be removed physically and/or by surface treatments (chemical etching, conversion coating) before applying organic coatings.

Newly galvanized steel (for painting purposes) is defined as not having received a surface treatment after galvanizing and the galvanizing occurred within 48 hours.[8] Even so, steps are recommended to ensure zinc corrosion products (ZnO and $Zn(OH)_2$) are removed from the surface. When abrasive blast

Continued

Editor's Note: This article is based on a paper the authors gave at PACE 2008, January 27-28, Los Angeles, CA. PACE is the joint conference of SSPC: The Society for Protective Coatings and the Painting and Decorating Contractors of America.

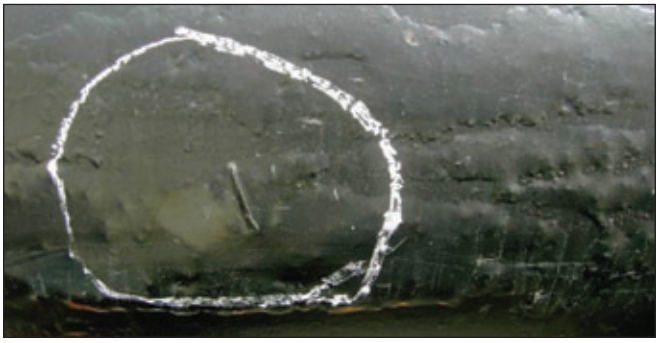


Fig 5: An intact coating blister on a galvanized mast arm. No free water was present.

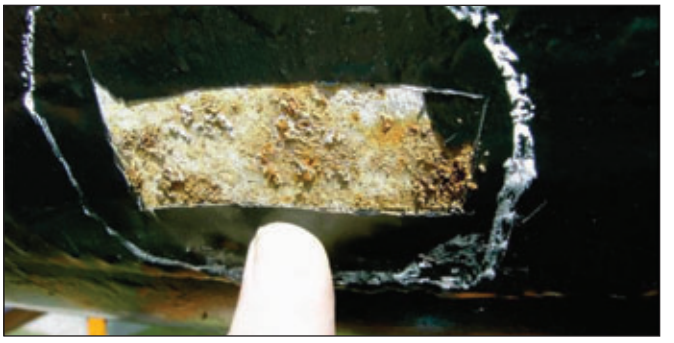


Fig 6: Corrosion products found beneath the intact blister (Fig. 5) included light red rust stain.

cleaning is used to texture the surface and remove the corrosion products, coating application should occur within 60 minutes if conditions favor formation of zinc salts. Partially weathered galvanizing should be evaluated for the presence of a (chromate) surface treatment and wet storage stain (white zinc salts consisting primarily of $Zn(OH)_2$). Once these issues are addressed, the partially weathered steel can be prepared in the same manner as newly galvanized steel—again with consideration of conditions favoring zinc corrosion. On the other hand, a weathered basic $ZnCO_3$ surface is suitable for painting without extensive preparation provided other interference materials are removed.

Coatings and Application

The most commonly used coating techniques for hot-dip galvanized mast arms are spray and electrostatic powder coating or brush and roller application of liquid coating and fluidized bed powder coating may also be used. Many generic coating types can be successfully applied to properly prepared galvanized steel.

Some resins, however, such as alkyds, oils and epoxy esters are not suitable because they may react with the alkaline salts that form on zinc surfaces. While often quite adequate in a dry environment, these coatings are quite susceptible to failure in wet, damp, or humid environments.

Polyamide epoxy is probably the most popular industrial coating applied directly to newly hot dip galvanizing. Once primed, the surface can be overcoated with a primer-compatible finish coat, commonly polyurethane. Powder coatings include epoxy, polyurethane, and polyesters. Use of surface treatments such as conversion coatings may be recommended by the coating manufacturers. The performance of a duplex system is generally understood to be related to isolating the reactive zinc metal surface from the environment. Yet, the combination of coating system dry film thickness (DFT), the specific product formulations selected, and overall system permeability may not yet have had sufficient discussion and may warrant further investigation.[9]

Weathered galvanizing is more easily coated than new or partially weathered galvanizing. Some coating manufacturer data sheets recommend allowing galvanized steel to weather for several

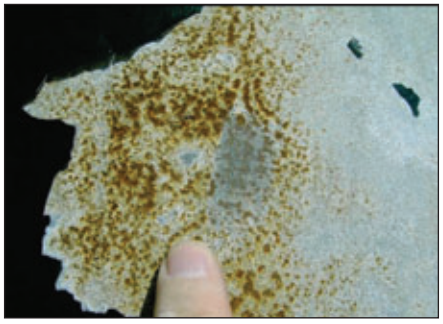


Fig 7: Shaving through the corrosion product to the substrate indicates rust stain originates in spots at the steel substrate.

months before coating because at this stage, application of coatings to galvanizing carries the lowest risk, but the substrate does require some degree of cleaning. Unfortunately, it is commonly not the most practical time. Weathered and aged galvanized steel exhibiting red rust is commonly coated with a zinc-rich organic coating.

Florida Requirements for the Masts

FDOT 2004 Standard Specification for Road and Bridge Construction (Standard Specification) Section 649—Steel Stain Poles, Steel Mast Arm and Monotube Assemblies—requires galvanizing components in accordance with ASTM A 123, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products, using methods suitable for painting. Surface preparation of all galvanized surfaces is to be done in accordance with ASTM D 6386 followed by solvent wiping in accordance with SSPC-SP 1, Solvent Cleaning, and application of either a two-coat liquid paint system or a powder coat system.

The specified liquid paint system is an epoxy primer (4.0 to 6.0 mils DFT) and aliphatic polyurethane finish (2.0 to 4.0 mils DFT.) The electrostatically applied urethane or triglycidyl isocyanurate (TGIC) polyester powder coat system requires a minimum DFT of 2.0 mils. The powder is to be cured by heating the coated structure to 350 F to 400 F.

Continued

Findings of the Investigation

The finding of zinc corrosion products indicates the cause of failure was related to inadequate surface preparation, which left zinc oxide and hydroxides on the galvanized surface. Zinc corrosion products are voluminous, as much as 500 times that of the zinc metal consumed. Thus, even though other surface contaminants can also compromise adhesion, the development of large and irregular blisters filled with zinc corrosion products (Figs. 5 and 6, p. 22) showed an ongoing corrosion process, not an interfering bond-breaker.

Figure 7 (p. 23) shows the surface beneath coating removed adjacent to peeling paint. The spots of pinpoint red rust among the white corrosion products indicate that lower, iron-containing layers of galvanizing and/or the steel substrate were corroding. The pattern was consistent with overblast damage from aggressive blast cleaning. An additional indication of inadequate surface preparation was high zinc edges from drip lines and zinc runoff.

The applied coatings consisted of a polyamidoamine epoxy primer and aliphatic acrylic polyurethane finish coat. Intercoat adhesion was good and system thickness was generally within the specification requirements. The topcoat appeared to be free of defects. However, the texture of the back surface of the primer suggested that abrasive blast cleaning may have been performed but was not uniform.

Quality control data from the galvanizing process was not readily available for review so a retrospective evaluation of the exterior galvanized surfaces was not fruitful. However, boroscope examinations of the unpainted interior surfaces found the galvanizing was not preventing corrosion of the steel substrate. Thus, it appears the galvanizing process itself may have been contributory to the exterior coating failure.

The findings in the Jacksonville mast pole coating failure investigation suggest a systematic, process problem was the root cause.

FDOT Approach to Resolution

Issues and Economic Considerations

FDOT inspected mast arm structures in Jacksonville and Orlando, FL, in September 2004 and reported an estimated failure rate of 15 to 20%. Based on the September inspections and November 2004 investigations, it was estimated that up to 3,000 of the roughly 15,000 coated galvanized mast arms in the state may have failed. A series of important issues was identified while developing an approach to resolving the problem with existing structures and future structures.

- Risk of catastrophic failure
- Risk to the motoring public
- Defining failure and degree of failure
- Impact on mast arm service life
- Resources required to identify failed units
- Remediation of failed units
- Interfacing with vendors to eliminate future failures on new structures

The potential economic impact of galvanized mast arm coating failures is significant, not only to the State of Florida but to the vendors as well. Each of the mast arms represents an investment of $50,000—a potential collective financial impact of up to $150 million.

Currently, any structures failing in less than 820 days fall under the latent defect clause of the standard specifications and must be repaired or replaced by the contractor. Structures older than 820 days are being handled on a structure-by-structure basis.

FDOT implemented a revised Section 649 of the Standard Specifications in June of 2007 to address future structures. This revised specification has no new direct instructions regarding materials or methods to paint a structure. However, it does require that the contractor designate a "responsible party" for the adhesion and color retention of the structures. The responsible party must also provide a five-year warranty that starts at project final acceptance and covers any repairs required for adhesion or color. The responsible party can be the contractor or the fabricator. When the responsible party is the fabricator, it must be pre-approved by the Department and be listed on the Pre-qualified Fabricators of Painted Galvanized Steel Strain Poles, Monotube, and Mast Arm Assemblies List. In addition, the fabricator must provide an annual bond based on the number of structures provided to FDOT the previous year.

Technical Considerations

The immediate technical considerations included identifying existing failed poles

Continued

and the procedures/protocols for remediation and establishing performance criteria to differentiate failing from non-failing poles.

Options for remediation of existing mast arms could range from in-situ cleaning and repainting to replacement. A statewide repair procedure for correcting failing structures, summarized below, was issued in April 2006.

- Identify failed mast arms by the presence of failed coating.
- Inspect the interior surface for steel corrosion.
  - Replace the structure if interior corrosion is present.
  - Repaint the structure if interior corrosion is not present.
- Repaint the structure in the field or in a shop as follows:
  - Pressure wash with 5000 psi
  - Abrasive blast SSPC-SP 10 (exception: leave good zinc)
  - Apply organic zinc primer and polysiloxane finish per manufacturer's requirements

Changes made to prevent future failures included implementing a revised qualified product list (QPL) in April 2007. Standard Specification Section 649 revision established color and coating adherence requirements and preparation of coupon standards.

Briefly, a coating failure has occurred when color degradation is greater than 8ΔE′ or coating delamination is greater than 100 square inches.

Conclusion

Vendor resistance to the 5-year bonding requirement was anticipated, but vendors have elected to participate. There are clear incentives for them to improve quality control to minimize the number of mast arm coating failures that occur. This is expected to increase the unit cost to the state to some degree. The full impact of these changes is not fully known at this time. However, it is expected that the state will receive an improved product, and the industry in general will likewise benefit.

Notes

1. Surface treatments may be used to prevent discoloration but are not recommended when galvanizing will be painted.
2. American Galvanizers Association 6881 South Holly Circle, Suite 108, Centennial, CO 80112.
3. SSPC: The Society for Protective Coatings 40 24th Street, 6th Floor Pittsburgh, PA 15222-4656.
4. NACE International, 1440 South Creek Drive Houston, TX 77084-4906.
5. ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959.
6. The galvanizer should be advised that the pieces are to be painted.
7. SSPC Surface Preparation Standards such as SSPC-SP 2- Hand Tool Cleaning, SSPC-SP 3-Power Tool Cleaning, SSPC-SP 7- Brush Off Blast Cleaning.
8. ASTM D 6386, Section 5.1.
9. Mark B. Dromgool PCS Managing Director, KTA-Tator Australia Pty Ltd, Personal communication.

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Test Method for the Estimation of the IMO PSPC "Walk-On Time" for Ballast Tank Coatings

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Photo © BP p.l.c.

The United Nations' International Maritime Organization (IMO) has recently published the new Performance Standard for Protective Coatings for Dedicated Seawater Ballast Tanks (PSPC). The standard, which took effect on July 1, 2008,[1] possibly represents the largest change ever seen in the requirements for selecting and applying ballast tank coatings since the mandatory coating of ballast tanks was introduced in the beginning of the 1990s. The PSPC is expected to have a major impact on all parties involved in shipbuilding, including marine paint manufacturers.

As required by the new PSPC, a new parameter called "walk-on time" is to be included in job specifications, in addition to other parameters such as recoating intervals.[1] However, until now, neither a definition nor a standardized method for estimating walk-on time has been developed. In response to this problem, a study was carried out in our laboratory to devise an appropriate test method.

This article discusses the study and reports on the determination of the walk-on time of several of our company's ballast tank coatings. The results obtained from testing as a reference a proprietary product from another manufacturer, with a quoted walk-on time, are also given.

What Is "Walk-On Time"?

Although no definition for this parameter has existed until now, our company uses the following definition for a similar parameter, the "dry-to-handle" time: "The paint surface is sufficiently hardened to be handled with care without coming off/being damaged."[2]

Similarly, and to have a definition to work with, the following definition was suggested for the walk-on time: "The paint surface is sufficiently hardened to be walked on without being damaged."

Methods And Materials

Initial Considerations

When considering how to estimate this new parameter, we assumed that the method should reflect reality as far as possible and also be reproducible. Obviously, the most realistic method would be to walk directly on the test specimens, but this was deemed not to be reproducible because, e.g., no two people walk alike, are the same weight, etc, and therefore a "standard" cannot be defined with

which to test against. The test method, therefore, would need to simulate, in some other way, the effect of walking on paint. This simulation was achieved by compressing the paint film with a standardized Teflon-coated block. A criteria based on the degree of paint deformation was then established to determine the walk-on time.

This approach was inspired by similar test methods, such as those that our company uses for estimating paint damage on keel block areas during dry-docking periods and for estimating "dry-to-handle" times.[3,4]

To determine what pressure would be the most suitable for estimating the walk-on time, it was roughly estimated how much pressure a person would apply to paint when walking on it. It was found that a person weighing around 90 kg (198 lbs) would apply a pressure of approximately 2 kg/cm^2 (approx 28 lb/in^2) in normal conditions. To account for all possible deviations from the controlled laboratory conditions that might be expected in reality, a safety factor was applied to this value. As a result, a pressure of 5 kg/cm^2 was selected to conduct the tests and eventually estimate the walk-on time.

Fig. 1: Pneumatic compressor machine used for the tests

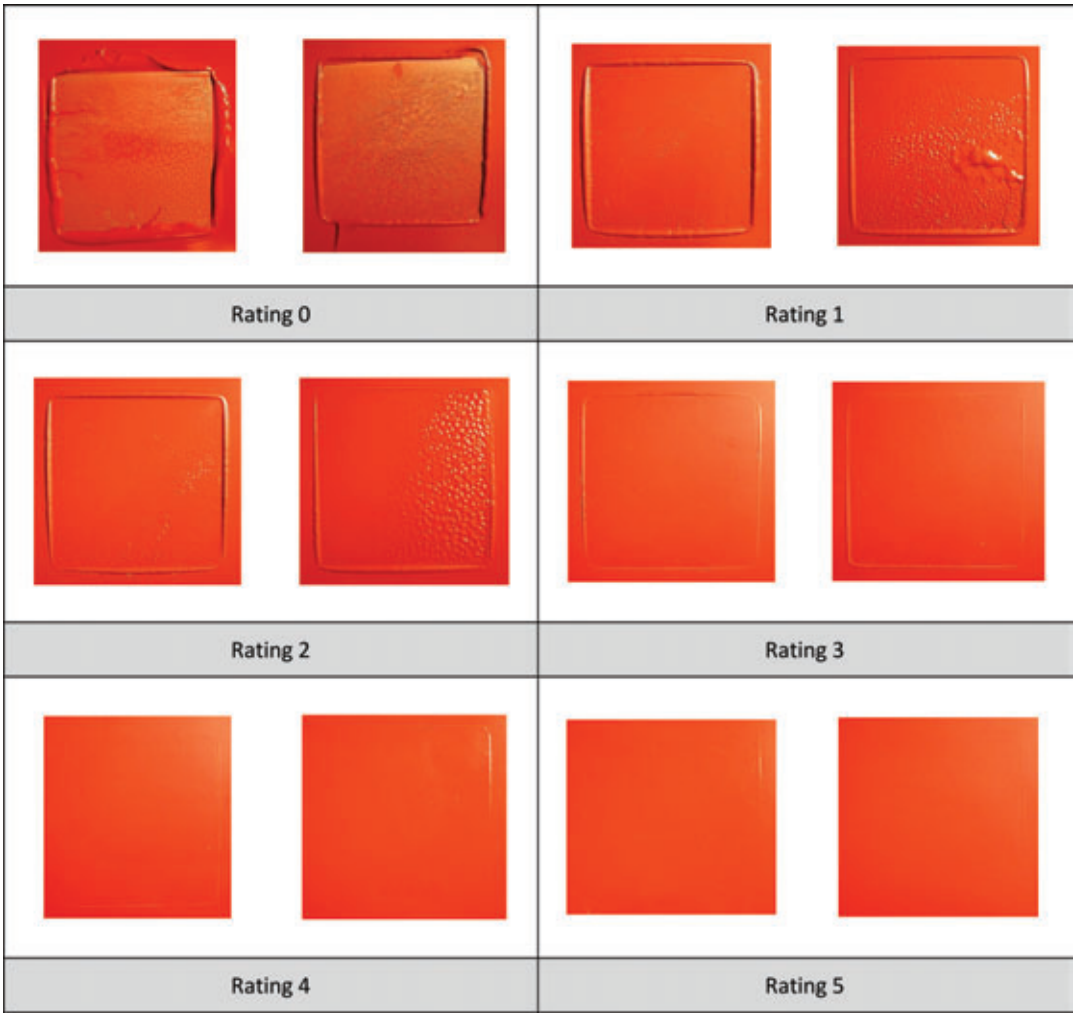
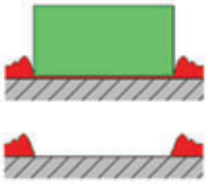
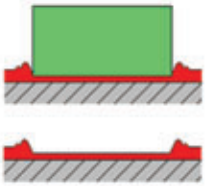
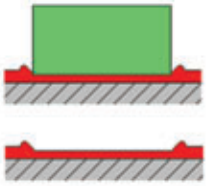
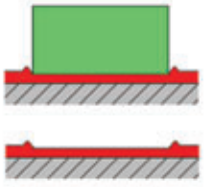
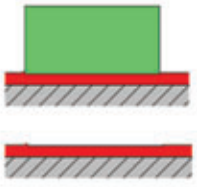
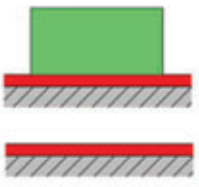


Fig. 2: Photographic standard with the different hardness ratings of the coating.

Table 1: Numerical Scale and Description of the Different Degress of Coating Hardness

Hardness Rating	Schematic representation	Description
Rating 0		Very severe deformation is observed. The majority of the volume of the paint oozes out from the area between the substrate and the block on all four sides, and film thickness is dramatically reduced through compression. The remaining paint sticks to the block and is removed with it, leaving the substrate visible.
Rating 1		Severe deformation is observed. A lot of paint oozes out from the area between the substrate and the block on all four sides, and film thickness is severely reduced through compression. Some film lifting might also be observed due to loss of adhesion
Rating 2		Deformation is observed. Quite a lot of paint oozes out from the area between the substrate and the block on all four sides. Film thickness is considerably reduced.
Rating 3		Some deformation is observed. Paint oozing, although less pronounced, still occurs on all four sides. Some reduction of film thickness due to compression.
Rating 4		Slight deformation is observed. Paint oozing, although sporadic, still occurs. Minor film compression.
Rating 5		Insignificant or no deformation is observed.

Applied Paints and Systems

Twelve of our company's ballast tank coatings were chosen for testing, and a proprietary product with its reported walk-on time was used as reference. These twelve products consisted of seven low-temperature products suitable for use within a temperature range of approximately −10 and 10 C (−50 and 50 F), and five products applicable at temperatures from approximately 10 C upwards. For each product, two different thick-nesses were tested: a single coat of ~160 µm and a single coat of ~320 µm. The dry film thickness (dft) of 160 µm corresponds to the nominal dft per coat of a two-coat ballast tank coating system, conforming to IMO PSPC. Double dft systems (320 µm) were also tested to evaluate the effect of this variable on the walk-on time, and to allow for the high film thickness areas that might be encountered in practice.

The test substrate used in all cases was

degreased, cold-rolled, mild steel, and all products were applied to the substrate with a hand-held applicator blade at 23 C (73 F)—standard laboratory temperature—at a relative humidity of approximately 50%. (In total, 185 test panels, each 150 x 200 x 1.5 mm in size, were used.)

Apparatus

A pneumatic compression machine (Fig. 1, p. 29) was used, consisting of a mobile arm with a Teflon-coated steel block of 25 cm^2 mounted at the end. The compression pressure and the indentation time were set by means of a manometer and a stopwatch, respectively.

Test Variables

The most relevant variables affecting the test specimens were temperature, compression pressure, dft, and time. The objective of the experiment was to define the drying profile and eventually estimate the walk-on time of each product by fixing all the above mentioned variables except for the time. For all products, the compression pressure was fixed at 5 kg/cm^2, as noted above, and the indentation time at 3 minutes. Where possible, the same test was repeated using a pressure of 25 kg/cm^2.

Three temperatures were selected to test the products: 5, 10 and 23 C (41, 50, and 73 F). Low-temperature products were tested at 5 and 10 C; the rest of the products were tested at 10 and 23 C. The testing at 5 and 10 C was carried out in a climatic chamber. The relative humidity was maintained at approximately 50%. For the test at 5 C, however, the relative humidity could not be controlled in the climatic chamber because its lowest limit is 10 C.

Experimental Procedure

At 23 C (73 F)

Between five and seven test panels were used to study the drying time of

Table 2. Hempel Products' Walk-On Times at 23°C and Two Dry Film Thicknesses

Product	Type	Experimental dft (µm)	"Walk-on time" at 23°C (h)
1.	2K high build polyamide adduct epoxy	178 290	6 7
2.	2K high build polyamide adduct epoxy	151 257	6.5 7
3.	2K High build polyamide adduct epoxy, reinforced with inorganic fibres	152 262	6.5 7
4.	2K high build polyamide/amine epoxy	193 319	5.5 6
5.	2K high build polyamide/amine epoxy	201 302	6 6.5
6.	Low temperature version of 1	195 29	4 4.5
7.	2K high build polyamide adduct epoxy	132 273	4 5
8.	2K solventless polyamine epoxy	189 295	9 10
9.	Low temperature version of 2	156 260	4 4
10.	Low temperature version of 3	142 276	4 4.5
11.	Low temperature version of 4	160 298	3.5 4
12.	Low temperature version of 5	155 275	4 4.5

the paint. Coatings were applied with a doctor blade applicator (a standard laboratory application tool) at 23 C. After the first test specimen was deemed ready for testing, it was placed in the pneumatic compression machine and subjected to a pressure of 5 kg/cm^2 for 3 minutes. This process was continued at either half-an-hour or one-hour intervals (depending on the case), until the degree of paint deformation was considered insignificant and all the test specimens had been tested. The final assessment was not made until the paint was completely dry and the dft had been measured for all test specimens.

At 5 and 10 C (41 and 50 F)

Testing was performed as at 23 C (73 F), but, in this case, with the pneumatic compression machine inside the climatic chamber. The paint was applied at 23 C, and, immediately afterward, each test specimen was transferred to the climatic chamber where the temperature had been set at the required value of 5 or 10 C. Ventilation was provided by two openings on either side of the chamber, allowing air to pass through.

Assessment of the Test Specimens

When a test specimen was subjected to the test pressure and the paint was not sufficiently hard, the following three main effects were observed.

- Film compression
- Paint oozing from the space between the block and the substrate
- Displaced paint, which formed a raised rim around the perimeter of the block

Table 3. Hempel Products' Walk-On Times at 10°C and Two Dry Film Thicknesses

Product	Experimental dft (µm)	"Walk-on time" at 10°C (h)
1.	148 280	15 18
2.	141 256	16 18
3.	155 250	15 17
4.	196 310	14 16
5.	155 300	15 18

These three effects led to different degrees of deformation of the paint film.

Previously, we had used two different methods for evaluating the degree of paint deformation in internal studies that dealt mainly with antifouling paints. In one case, a numerical scale from 1 to 5 was used, comprised of a series of drawings describing the kind of damage caused by the pressure to the paint.[4] In the other case, a numerical scale was used again, but this time from 0 to 5, including a photo legend as reference with a written description of the different degrees of deformation.[2]

The evaluation method used in this article's study was a variation on the second method above, accounting for all the different types of damages observed to the paint throughout the course of the various tests. A new numerical scale from 0 to 5 representing different degrees of coating hardness was employed, using both new descriptions and a new photo-legend as reference.

The degree of paint deformation was assessed by comparison with the photographic examples in Fig. 3 on p. 29 and by using the hardness ratings and descriptions given in Table 1 on p. 30. The criteria for a test result to be considered as the walk-on time was a

Table 4. Hempel Products' Walk-On Times at 5°C and Two Dry Film Thicknesses

Product	Experimental dft (μm)	"Walk-on times" at 5°C (h)
6	134 270	13 16
7.	142 290	14 18
8.	201 291	> 23 > 24
9.	142 248	16 18
10.	176 278	13 15
11.	213 356	14 16
12.	165 290	14 16

Table 5. Proprietary Product's Walk-On Times at 23°C and Two Dry Film Thicknesses

Product	(Experimental) dft (μm)	"Walk-on time" at 23°C (h)	Published "Walk-on time" (h)
Proprietary	208 311	5 5.5	3

hardness rating of 5; this rating implied insignificant or no deformation, which is in accordance with the definition originally suggested in the study for walk-on time.

Results and Discussion

The compression pressure did not influence walk-on times significantly. The results obtained with 5 and 25 kg/cm^2 were very similar. These results indicate that once the paint film has increased its consistency sufficiently to withstand 5 kg/cm^2, it can withstand much greater pressures; and this was another reason a pressure of 5 kg/cm^2 was originally chosen after some preliminary trial tests. Consequently, only results obtained with a pressure of 5 kg/cm^2 are shown.

The dft had only a slight effect on walk-on times measured at 23 C (Table 2, p. 32), suggesting that solvent evaporation has little influence on the film forming process. Film formation takes place by both solvent evaporation and chemical reaction. However, it seems that at 23 C, the solvent evaporates very rapidly, so in this case it is the chemical reaction that is the most influential variable in the process.

Regarding the walk-on times measured at 10 and 5 C (Tables 3 and 4), the dft seemed to have more of an effect. The effect of increased dft might be due to the lower evaporation rate expected at these temperatures.

The data sheet for the proprietary

product tested as reference at 23 C (73 F) states that the product's walk-on time is a little faster than all our company's conventional ballast tank coatings (Table 5, p. 35). Interestingly, the product data sheet states walk-on time as three hours, but the dft is not mentioned. However, after this drying time, the paint condition was found to be completely unacceptable, according to the estimation method described in this study (a time of three hours would be rated as 1 according to the 0 to 5 scale used for assessing the test specimens). This discrepancy may be explained in one of the following ways.

- The estimation method used to determine the proprietary product walk-on time is less conservative than that used in this work.
- The test conditions used for the determination of the proprietary product walk-on time are based on data from the field.

Regardless of the real explanation, correlation with field experience would certainly be advisable and beneficial in the future. The comparison of this data with laboratory data would make it possible to evaluate to what extent the test method represents reality. Thereafter, the test conditions could be adjusted accordingly.

The test method described in this paper is a reproducible means of measuring walk-on times for ballast tank coatings, and it is believed to reflect well the practical walk-on time of coatings applied according to specification.

Acknowledgements

I would like to express my gratitude to all my colleagues in the Test Department and the Group Technology Centre at Hempel A/S for all their guidance and support.

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1. Resolution MSC.215(82): Performance Standard for Protective Coatings for Dedicated Seawater Ballast Tanks in All Types of Ships and Double-Side Skin Spaces of Bulk Carriers, IMO, London, UK.
2. *The HEMPEL Book of Product Data Sheets*, Hempel A/S, Lyngby, Denmark.
3. "Wooden Block Settings," HEMPEL Code of Testing DWT-A/2008, Hempel A/S, Lyngby, Denmark.
4. "Dry to Handle," HEMPEL Code of Testing DWT-A/2008, Hempel A/S, Lyngby, Denmark.

JPCL

Investigating Corrosion Protection of Offshore Wind Towers

Part 3: Results of the Laboratory Investigations

Editor's Note: This article is the third part of the authors' report on testing coating performance on offshore wind towers. The first part, "Investigating Corrosion Protection of Offshore Wind Towers," was published in the April 2008 JPCL *(pp. 30–43) and won SSPC's highest editorial honor, the Outstanding Paper Award, which was announced at PACE 2009. Part 1 described the rationale behind the authors' test program. Part 2, "Results of the Site Tests," which described fouling on the coated steel panels on the field test site as well as coating performance on the panels, was published in the April 2009* JPCL *(pp. 24-34). In addition to appearing in the print edition of* JPCL, *Parts 1 and 2 can also be accessed in the* JPCL *archives on www.paintsquare.com.*

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This article is the third part of a report on a nationally funded project on the performance testing of different corrosion protection systems for offshore wind towers under site and laboratory conditions.[1,2] Part 3 deals mainly with the corrosive stress, although researchers found that biological stress may also play a role in the conditions offshore, as described in Part 2 (April 2009 *JPCL,* pp. 24-34). The corrosive stress includes features such as seawater exposure, wet-dry cycles, temperature variations, construction details (joints, bolts, welds), and construction materials (material combinations).

Part 3 of the study discusses the results of the laboratory investigations of several coatings on offshore wind towers and compares them with site testing of the same systems.

Test Rationale

The rationale for the test program is based on the following. The location of steel structures several miles offshore is not a new situation. Oil and gas exploration and extraction platforms have performed in such areas for decades. There are, however, critical differences between platforms and towers, the most significant being that offshore wind energy towers are unmanned structures with highly restricted access. On oil and gas platforms, corrosion protection systems are generally under permanent inspection, which is not the case on offshore wind energy towers. Thus, whereas on oil and gas platforms, areas of

deteriorated coating can be recognized and repaired comparatively easily, such repairs are not feasible on offshore wind energy towers.

Laboratory Test Samples

Three types of laboratory samples were manufactured. The first type covered the specimens for the degradation tests according to ISO 20340, "Performance requirements for protective paint systems and current test scenarios." The coated specimens were provided with two artificial scribes to simulate localized mechanical damage. The second type covered the specimens for the cathodic disbonding tests. The specimen consisted of a lower primary section and an upper, smaller secondary section, whereas the top part of the upper section remained uncoated. A hole with a controlled cross section (Ø 10 mm) was drilled through the coating down to the plain steel in the center of the specimen. The third specimen, used for EIS-measurements, was a simple, coated plate 30 mm x 30 mm. More detailed descriptions of the laboratory samples and tests conducted can be found in Part 1 of this series (April 2008 *JPCL*, pp. 30–43).

Results of the Accelerated Ageing Tests

The coatings tested are shown in the box below. The results of the accelerated ageing tests according to ISO 20340 are shown in Table 1 (p. 40). The various coating systems responded differently to the applied stresses. As expected, the number of ageing cycles had a notable effect on the coating systems, although the actual effects depended on the particular coating system. In terms of corrosion protection performance, the tendency of a coating to blister and delaminate and, as a result of the corrosion process, the occurrence of corrosion products like white rust and red rust were taken as benchmarks for the assessment process. Chalking was considered a secondary issue of the degradation of the polymer coatings.

The upper row of photographs in Table 1 illustrates the appearance of the samples after four ageing cycles (total exposure time of 1 month). System 1 exhibited notable traces of red rust in both scribes. Blister formation occurred, starting from the edges of the horizontal scribe. Chalking could not be observed because of the PU topcoat. System 2 featured slight traces of red rust and slight chalking. In the horizontal scribe, Systems 3 and 4 showed notable white rust formation resulting from the cathodic protection of the steel from the metallization layer. System 4 had started to chalk. System 6 showed no corrosion in the scribes. System 5, the single-layer thick coating, was not part of the laboratory tests.

The visual inspection of the coating systems after 18 ageing cycles (total exposure time of 4.5 months) gave the following results. System 1 showed massive delamination at the scribes and blistering around the scribes. The substrate corrosion was severe in both scribes. System 2 exhibited severe corrosion in the scribes, combined with signs of underrusting. System 3 featured red rust, an indication that the cathodic protection capability of the metallization was starting to deteriorate. Cracks started to form at the edges of the horizontal scribe. The cracks were probably caused by the volume expansion of the corrosion products. System 4 still showed white rust, evidence that the cathodic protection from the metallization was still active. Chalking was severe for System 4. System 6 exhibited moderate corrosion only in the horizontal scribe.

The second row in Table 1 illustrates the appearance of the coating systems after 25 ageing cycles (a total exposure time of 6.25 months). System 1 was severely deteriorated. It showed notable substrate corrosion in both

Coating Systems Tested (Composition and dft)*

System	Primer	2. Layer	3. Layer	4. Layer	Total dft
1	Zn-EP (80 µm)	EP (300 µm)	EP (300 µm)	PUR[1] (70 µm)	750
2	Zn-EP (80 µm)	EP (450 µm)	EP (450 µm)	-	980
3	Zn/Al (85/15)[2] (100 µm)	EP[3] (20 µm)	EP (450 µm)	EP (450 µm)	1,020
4	Zn/Al (85/15)[2] (100 µm)	EP[3] (20 µm)	EP[4] (450 µm)	EP[4] (450 µm)	1,020
5	EP[5] (1,000 µm)	-	-	-	1,000
6	Al/Mg (95/05)[2] (350 µm)	EP[6] (40 µm)	-	-	390

*µm÷25.4=mils [1] topcoat; [2] metallization; [3] primer + pore filler; [4] particle reinforced; [5] applied in one layer (not part of laboratory tests); [6] (pore filler)

scribes, underrusting, blistering around both scribes, and partial delamination of the coating system. System 2 performed only slightly better. It exhibited corrosion in both scribes, combined with blister formation around the scribes and underrusting. System 3 showed underrusting, with the corrosion in the scribes dominated by red rust formation, indicating that the cathodic protection capability of the metallization was exhausted. The cracks, originating from the edges of the horizontal scribe, were extended. System 4 performed well. Only initial underrusting could be noted; the corrosion in the scribe was dominated by white rust formation. System 6 was still in a very good condition with just slight corrosion formation in the horizontal scribe.

The results were interpreted in terms of an "Anticorrosive Effect" (AE) as suggested by reference 3:

$$AE = \frac{(A+B+2 \cdot C)}{4}$$

Here, AE is the anticorrosive effect. A is a term related to the blister degree (according to ASTM designation); B is a term related to scribe delamination; and C is a term related to rust degree (according to SSPC designation). A value of AE=100 characterizes best performance. The parameters A to C must be estimated according to a matrix procedure.[3] The estimated AE values are listed in Table 1.

Based on the above procedure, the ranking of the systems after the ageing test according to ISO 20340 is as follows (from best to worst): 6, 4, 3, 2, 1. The ranking corresponds very well with the ranking obtained from the results of the site tests.[1] Another result worth mentioning is that the damage to the coatings was much more severe after the artificial ageing procedure compared to the ageing under site conditions.

Results of the Cathodic Compatibility Tests

Figures 1 and 2 (p. 43) show the results of the compatibility tests. The graphs show two lines for most systems because two samples were investigated for each system (except for System 6). The current consumption is a criterion for assessing the compatibility of the systems with cathodic protection. If cathodic disbonding occurs and part of the steel substrate

Table 1: Visual Appearance and AE Values of the Coating Systems after Accelerated Ageing per ISO 20340

Number of Ageing Cycles	Coating System				
	1	2	3	4	6
4 Cycles (1 Month)					
25 Cycles (6.25 Months)					
AE Value* (After 25 Cycles)	65	82	85	87	100

*See Eq. (1)

is exposed, the consumption of current increases to try to protect the substrate. Figure 1 shows the results of the compatibility test according to ASTM G8. (See Part 1 of the paper for the testing conditions.[2]) It can be seen that the current consumption for Systems 1 to 4 stayed at a stable level over the entire testing period of 30 days. No disbonding was noted during a visual examination after the tests. Thus, these systems were compatible with cathodic protection. System 6 consumed a high amount of current immediately after the test started, and coating delamination was noted during a visual assessment of the specimens after the test. The cause for these phenomena was assumed to be metal dissolution rather than cathodic disbonding. The potential of -1.450 mV_{SCE}, applied during the test, was below the potential that dissolution of the metal occurs.

Figure 2 shows results of the compatibility tests according to ISO 15711-2. (See Part 1 of the paper for the testing conditions.[2]) Differences in the scale of the current consumption (compare to Fig. 1) are due to the different applied polarization potential and the electrolyte. In the first period of polarization, the current decreased due to the precipitation of less soluble salts (Mg, Ca salts) on the metal surface as a result of cathodic polarization. No delamination of the coating could be noted, either by increase of the current consumption or by visual examination after the test. Hence, all systems passed the test and were compatible with cathodic protection.

Results of the Electrochemical Impedance Tests

From EIS spectra, ohmic and capacitive properties of the organic coating can be obtained by applying model-like equivalent circuits. (For a discussion on the interpretation of EIS spectra obtained from organic coatings, see Ref. 4.) The ohmic resistance of a non-defect coating is interpreted as barrier resistance, which is considered one of the corrosion protective properties of a coating.[5-8] Parameters to be interpreted include impedance and phase angle. As an example, these two parameters are plotted against the frequency of the impressed voltage in Figs. 3 (p. 44) and 4 (p. 45) for System 4, in terms of a Bode plot. Figure 3 shows impedance against frequency for different time periods. The almost linear relationship for t=0 days characterizes an intact virgin coating. The graph is not completely linear (see lower frequencies), indicating that the response of the coating is not plainly capacitive. The coating had probably already absorbed some water.

After 7 days, the shape of the graph changed, whereby the values for low frequencies decreased. This decrease was due to a decrease in the coating resistance, which resulted from the water uptake of the coating. These effects became stronger with extended immersion time. This interpretation holds for the situation in Fig. 4, where the phase angle is plotted against the frequency. For a plain capacitive response, the phase angle should be -90° over the entire frequency range for t=0 days. This was not the case for the lower frequencies. For the longer immersion periods, the phase angle was no longer constant with frequency, and the value was -90° only at high frequencies. The Bode plots for the other coating systems showed equal qualitative trends.

Figure 5 (p. 46) summarizes the results of the EIS measurements. At the beginning of the tests, the coatings exhibited a high resistance. Over the time, the barrier resistance of the coatings diminished, while the degree of reduction depended on the particular coating system. After a certain immersion period (about 40 days), the resistance values approached saturation levels. The major cause for the reduction in the resistance values is the penetration of the electrolyte (water), creating a path to the surface of the subjacent steel. The levels of the saturation values (between 10^9 and 10^{12} Ωcm^2) still exceeded a critical value of 10^7 Ωcm^2, which is suggested to be a limit for a good protective performance.[5] The plots in Fig. 5 allow for a unique ranking of the coating systems according to their final barrier resistance. The ranking is as follows (from best to worst): 1, 2, 3, 4.

Table 2: Ranking of the Coating Systems for Different Test Conditions

Test Condition		
Site tests Helgoland*	ISO 20304	EIS
Coating System Ranking		
-	6	-
3	4	1
4	3	2
2	2	3
1	1	4

* See Ref. 1

Comparison between Results from Site Tests and Laboratory Tests

The relationship between accelerated laboratory tests results and real conditions has been an issue in coating research for decades. Recent works in relation to maritime constructions, respectively with offshore constructions, include a number of studies.[9-12] It was shown, among other results, that cyclic tests are more predictive in terms of coating performance than traditional non-cyclic corrosion tests under certain conditions. Cyclic wetting and drying during accelerated tests is particularly important to obtain good correlation with field exposure.[9] Thermal cycles also allow test durations to be reduced considerably.[7]

Table 2 gives the results of the tests performed in the present study in terms of system ranking. The results obtained during the accelerated cyclic tests agree with those of the long-term site tests for samples in the intermediate zone (IZ). The results from the EIS investigations, however, show an opposite trend. Coating

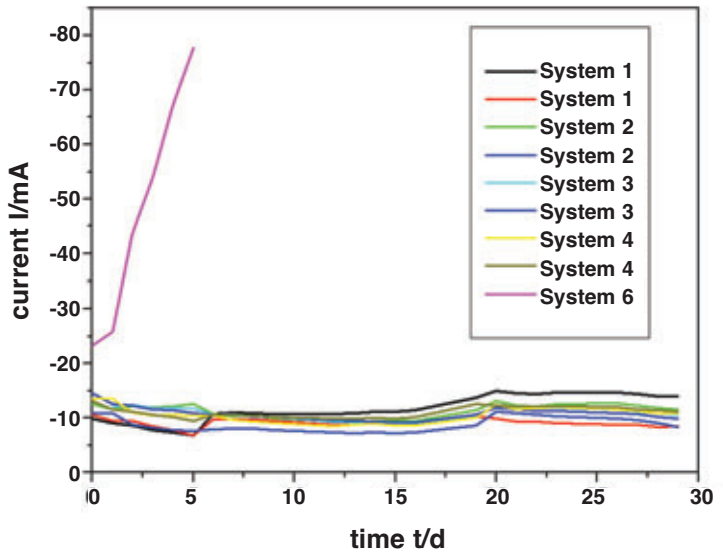

Fig. 1: Current consumption of coated and pre-damaged specimens, estimated as per ASTM G8

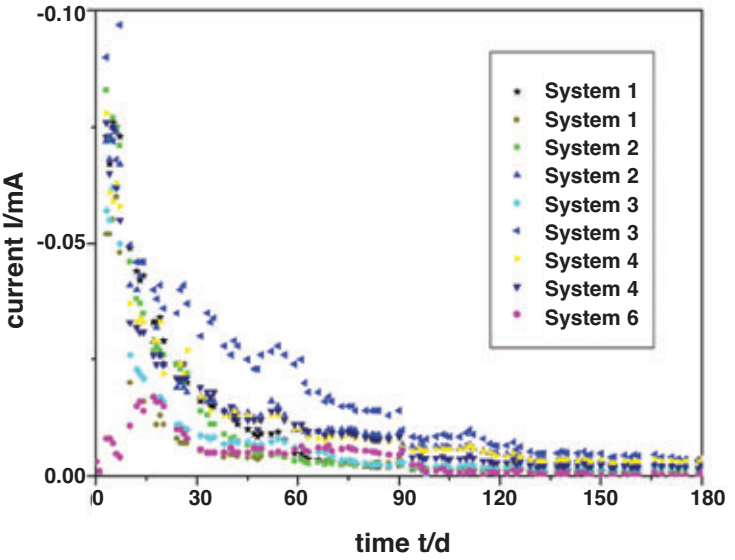

Fig. 2: Current consumption of coated and pre-damaged specimens, estimated as per ISO 15711-2

systems that performed well during accelerated testing and site testing did not show good results in terms of resistance (EIS). This surprising result is indicative in a way that a good barrier resistance, measured under constant climatic conditions (stable temperature, stable electrolyte composition, no wet-dry cycles), does not necessarily guarantee a good protective performance of the coatings under cyclic load conditions (changes in temperature and electrolyte composition, dry-wet cycles). One explanation for this phenomenon can be the pigmentation of some of the investigated systems. Investigations described in Ref. 13 suggest that certain pigments affect the water balance in an organic coating, especially in case of sudden changes in climatic conditions. This effect could be caused by condensation nuclei formed at the pigment particles. Therefore, good protection performance from such a system under cyclic conditions would not be a result of a superior barrier resistance in the first place, but rather due to the avoidance of "microfogging,"[13] which is the generation of excess water caverns

in the coating by condensation of molecular dispersed water in the coating due to temperature changes. This phenomenon will be the topic for further investigations.

Another striking result was the behavior of the Al/Mg metallization (System 6). This system performed best during the accelerated cyclic tests (ISO 20340), but failed during the site tests in the underwater zone (UZ). The most notable differences between the accelerated and site test scenarios were the formation of fouling at the site test and the cathodic protection applied to the site test samples. Further investigations are planned to explore this phenomenon.

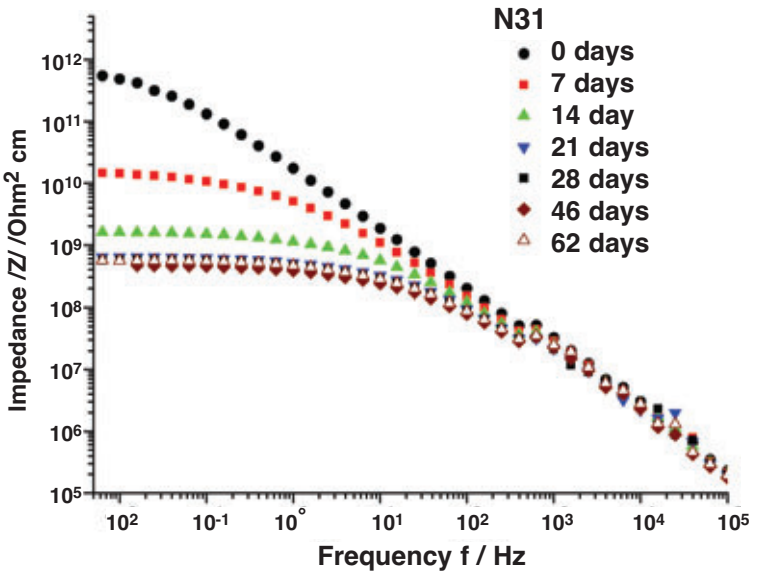

Fig. 3: Bode-plot for System 4. Impedance versus frequency

Summary

- Offshore wind towers are subjected to complex environmental stresses. An approach was made to reproduce the stresses through accelerated laboratory tests with defined stress conditions and through site tests with real stress conditions.
- A particular protection system needs to pass all laboratory tests, in which individual properties, such as durability under cyclic environmental load and cathodic compatibility, are estimated.

Because each individual test allows a ranking of the systems, a "protection performance profile" (PPP) of any individual coating system can be derived at the end of the investigation. Based on the PPP, the best system can then be selected.

- Site samples and samples after accelerated ageing tests (ISO 20340) could be equally ranked. However, after 25 ageing cycles, the deterioration of the coatings of the laboratory samples was notably more severe than that of the site samples.
- EIS is a promising method for a quick and reliable assessment of the barrier resistance of protective coating systems. However, high barrier resistance does not necessarily guarantee a good protective performance of the coatings under cyclic load conditions. The EIS helps in understanding the detailed protection principles of coatings and can, therefore, deliver fundamental information for coating optimization procedures.
- The results of the cathodic disbonding test as per ASTM G8 show that limits exist for an artificial acceleration of corrosion protection tests. Acceleration is useful only if the general corrosion process is not altered due to acceleration effects.

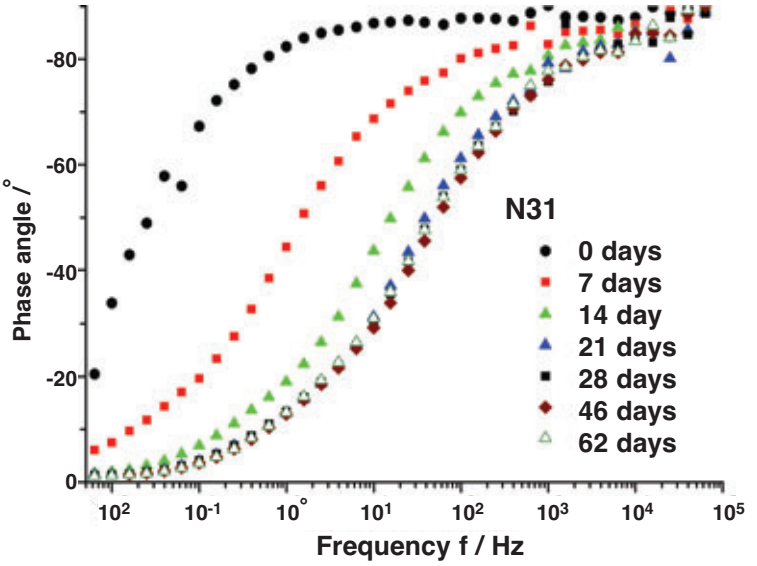

Fig. 4: Bode-plot for System 4. Phase angle versus frequency

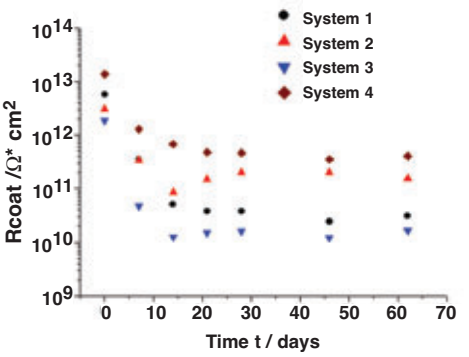

Fig. 5: Development of barrier resistance as determined by EIS

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PACE MOVES WEST FOR 2010

Photo courtesy of Greater Phoenix Convention & Visitors Bureau

Photo courtesy of Greater Phoenix Convention & Visitors Bureau and Robert Silberblatt

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For its sixth year, PACE 2010, the joint conference of PDCA and SSPC, will take place in Phoenix, AZ, from February 7-10, 2010. While everyone may have a different reason for attending PACE this year, there certainly is something for everyone including opportunities to network, business and coatings education, and an extensive exhibition hall.

The next several pages will give attendees a head start on planning their PACE experience, with SSPC course previews starting on p. 49 and exhibitor descriptions starting on p. 54 (current as of press time). This preliminary preview is subject to change. Stay tuned for *JPCL*'s full PACE preview in the December issue and updates in January.

For more information, or to register for PACE, visit www.pace2010.com or contact SSPC at 877-281-7772.

A Preview of PACE 2010

SSPC courses provide industrial and marine coatings professionals with the opportunity to increase their knowledge, skills, and certifications. Nearly 20 different SSPC courses will be offered at PACE 2010 in Phoenix, including the following.

SSPC Bridge Coatings Inspector Program (BCI)

The Coatings Inspection Training and Certification for the Bridge Industry Program has been developed by a task group assembled of bridge facility owners (DOTs and Bridge and Tunnel Authorities) to serve as a certification process for bridge coatings inspectors. Designed for bridge coatings inspection personnel such as facility owners, contractors, and consultants, the program consists of three days of lecture and practical hands-on instruction, a course examination, and a certification examination. The BCI course covers the fundamentals of how to inspect surface preparation and application of protective coatings on bridge steel. These fundamentals are applicable to coating work performed both in the shop and in the field. The course also covers unique situations that will affect inspection in the field (e.g., containment, field safety hazards, and changing weather conditions).

SSPC Protective Coatings Inspector Program (PCI)

The objective of this course is to thoroughly train individuals in the proper methods of inspecting surface preparation and installation of industrial and marine protective coatings and lining systems on an array of industrial structures and facilities. The course provides participants five days of intensive training and includes multiple workshops and problem-solving exercises so that participants may immediately apply the learning in a classroom setting, without the pressures of production and project schedules. Students passing both components of the basic course exam at 70% or higher and meeting the prerequisites for certification can take the written and hands-on certification exams on day six. A passing grade of 80% or higher on the written and hands-on certification exam is required to become an SSPC Certified Coatings Inspector.

SSPC Fundamentals of Protective Coatings (C-1)

This course provides a practical and comprehensive overview for those who are new to the protective coatings industry. It is also an ideal refresher for reviewing the fundamentals of corrosion and the use of coatings as a protective mechanism against corrosion and deterioration of industrial structures. Each participant will receive a comprehensive manual that includes a glossary of terms, references for additional reading, and copies of relevant handouts, standards, and regulations. The written exam consists of 100 multiple-choice questions. To receive a certificate and CEU's, you must attend all 40 hours of the course and attain a 70% or better score on the exam.

SSPC Planning and Specifying Industrial Coatings Projects (C-2)

This course is designed to provide those who understand coating fundamentals with an overview of the principles of planning, awarding, and monitoring the quality of new construction or maintenance painting projects. Included in the course is an overview of the coating fundamentals covered in SSPC's C-1 course. C-2 fulfills part of the training requirement for SSPC Protective Coatings Specialist (PCS) certification and prepares participants for the challenging Protective Coatings Specialist Exam.

SSPC Marine Coatings

This is a five-day fundamental training program that covers the practical aspects of the selection, specification, and use of coatings in a safe, effective, and economical manner to protect structures in harsh marine environments. The written exam consists of 100 multiple-choice questions. To receive a certificate and CEUs, you must attend all 40 hours of the course and attain a 70% or better score on the exam.

SSPC NBPI (NAVSEA Basic Paint Inspector)

The NBPI course is a five-day quality assurance (QA) course that was developed by Naval Sea Systems Command (NAVSEA) to train coatings inspectors to inspect critical coated areas as defined by US Navy policy documents. These areas include (but are not limited to) cofferdams, decks for aviation and UNREP, chain lockers, underwater hulls, bilges, tanks, voids, and well deck overheads. What makes this course especially valuable is that it also provides both the technical and practical fundamentals for coating inspection work for any steel structure projects other than ships. Four days are devoted to classroom lecture and extensive hands-on training. On the fifth day, the NBPI Course Exams are given.

SSPC Water Jetting Program (C-13)

This program assesses the skills of water jetters who have a minimum of 120 hours of water jetting work experience and prior documented employer-provided training on water jetting equipment. Candidates are certified through a brief written exam and a practical hands-on skill assessment. This is not a training program for beginners. It is a certification program for water jetters who have met specific experience requirements. The one day classroom portion begins with an overview of all surface preparation methods and basic safety followed by an intensive discussion of equipment and productivity and guidelines for using SSPC VIS 4 to achieve the

SSPC SP-12 cleaning levels. On day two there will be an exam followed by a tailgate safety meeting to review safe gun operating procedures, including troubleshooting and signals, before the hands-on session takes place.

SSPC Lead Paint Removal (C-3)

C-3 includes background information on the hazards of lead and other toxic metals as well as information on the current legal and regulatory environment. The course contains discussions on protecting workers; compliance with environmental regulations; proper management of waste streams and operations that result in potential exposures to lead; and associated control technology. The course also addresses reading specifications and developing programs to effectively control risks to workers, the public, and the environment. It concludes with a discussion of insurance and bonding issues, and an introduction to other safety and health issues that are encountered on painting projects. The C-3 Course meets the competent person training requirements for SSPC QP-2.

(photos pages 50-62 courtesy of PACE)

SSPC Applicator Train-the-Trainer

The course is designed to train owners, supervisors, and other representatives of industrial painting contracting companies to conduct the two levels of the SSPC Applicator Training Program for surface preparation and coating application. The program covers topics in the areas of surface preparation and coating application for Levels I and II. Level I training is especially designed for entry-level employees new to the coatings industry, while Level II meets the training needs of more seasoned craft workers. The two-day program reviews the applicator curriculum through lectures, team exercises, and a hands-on component that covers hand- and power-tool cleaning, blasting, and spray application. The trainer course concludes with two short Level II exams, one covering surface preparation and one covering coating application. Trainers completing the "Train-the-Trainer" session are qualified by SSPC to return to their facilities and teach the SSPC curriculum to their workers.

PDA's Introduction to Polyurea for the Applicator and Contractor

One of the Polyurea Development Association's (PDA) most popular courses, designed specifically with the applicator and contractor in mind, this session will expand on topics of physical properties of polyurea, testing procedures, surface preparations, application procedures and techniques, and advances in and types of equipment. To register for this event, contact Casey High at PDA HQ—email: casey@robstan.com; tel: 816-221-0777.

SSPC Airless Spray Basics (C-12)

For the first time in the protective coatings industry, SSPC has designed a program that incorporates paint simulator hands-on training. You'll learn the proper technique for airless spray painting by using a program that simulates real life situations and equipment used in the field. Simulation training provides instant computerized assessments of applicator transfer efficiency, coating thickness, amount of coating sprayed, and application time so that you can make quick adjustments to improve your practice. The classroom session focuses on the fundamentals (e.g., material ratio, material viscosity, mixing, ambient conditions for application and curing, product data sheets, material safety data sheets, spray technique); equipment operation; troubleshooting basics and lessons learned; coating materials appropriate for airless spray; and quality control basics. The hands-on assessment requires each candidate to operate the virtual paint simulator to spray coatings to meet the coating manufacturer's product data sheet (PDS) requirements.

SSPC Evaluating Common Coating Contract Clauses

This course provides a basic overview of those clauses most common to coatings contracts. It follows the outline of a standard construction contract while also teaching students to identify the key provisions that may be missing from contracts they receive. The format consists of lecture, scenario-based exercises using a sample contract, quizzes, and final exam. This course is strongly recommended as a prerequisite for anyone taking SSPC's Project Management for the Industrial Painting Contractor.

SSPC Thermal Spray Training

This is a one-day training program with modules that define thermal spray coating (TSC) and provide an overview of its application and uses. The three types of arc spray equipment, their components, and safety considerations during their operation are discussed, and SSPC CS-23/AWS C2.23M/NACE No.12, "Specification for Application of Thermal Spray Coatings (Metallizing) of Aluminum, Zinc and Their Alloys and Composites for the Corrosion Protection of Steel," is summarized. The modules are supplemented by exercises in which students inspect blasted surfaces for degree of cleanliness of the panels, determine the profile, perform bend tests and inspect the bend, determine the DFT, and perform the cut test and assess the cut.

SSPC Lead Paint Refresher Course (C-5)

This one-day course provides refresher training for supervisors/competent persons who are responsible for industrial deleading operations. It begins with a review of basic information about lead and the human health hazards associated with it. The course continues with a review and update of relevant EPA regulations and progresses through discussions of 29 CFR 1926.62 and changes in the Respiratory Protection Standard (29 CFR 1910.134). C-5 concludes with discussions about control over emissions as presented in SSPC Guide 6. The C-5 Course meets the competent person training requirements for SSPC QP-2 Contractor Certification as well as the requirements of state programs that require refresher training to maintain supervisor certification.

SSPC Abrasive Blasting Program (C-7)

C-7 is designed to certify operators of dry abrasive or portable centrifugal blast cleaning equipment. It covers principles of surface preparation, surface cleanliness, surface profile, dust and debris control, and abrasives. The program's primary focus is the certification of the blasters who demonstrate proper blasting techniques during the hands-on session. The course starts out with a classroom overview of fundamentals in preparation for the written exam, which is then followed by a thorough review and walk-through of abrasive blasting and portable centrifugal blasting equipment setup and operation. Once the written exam is completed, a tailgate safety meeting is conducted to review safe gun operating procedures, including troubleshooting and signals, before the hands-on session takes place.

SSPC Floor Coating Basics (C-10)

This course is designed to meet the practical training requirements of SSPC-QP 8 Section 4.4, which requires that each job crew chief and each QC manager complete a minimum two-day overview of concrete components, coating and surfacing types, and surface preparation and substrate repair techniques based on SSPC consensus standard TU-10, "Procedures for Applying Thick Film Coatings and Surfacings Over Concrete Floors." Day one is devoted to a brief overview of the basic properties of concrete, condition assessment, planning, surface repair, and joint treatment. Sealers, primers, and topcoats and application procedures and post-

job quality control are covered during day two. The course also features six interactive exercises addressing ambient conditions, use of technical and material safety data sheets, selecting coating systems, adhesion, and calculating thickness and volumes.

SSPC Project Management for the Industrial Painting Industry

This course offers a fundamental introduction to those project management concepts used on industrial painting projects. Those new to or interested in becoming project managers in industrial painting can learn more about generating new business, reviewing contracts, navigating employee relations, and building safety into the job. The written exam is based on a "Real World Project." "Evaluating Common Coating Contract Clauses," offered on Feb. 7, is strongly recommended as a prerequisite for anyone taking this course.

SSPC Quality Control Supervisor (QCS)

This course is designed to provide training in quality management for SSPC-Certified contractor personnel, Technical Quality Managers (TQMs), and inspectors employed by SSPC-QP 5 inspection firms. It provides an overview of the quality management aspects of surface preparation, paint, coatings, and inspection operations that a Quality Control Supervisor (QCS) needs to know to ensure delivery of a quality product to customers. It is highly recommended that persons attending the QCS course have recent inspection training (SSPC PCI, NBPI, or BCI) or equivalent formal training and also have some quality control experience. This course is not intended to replace the more formal quality management courses available from such organizations as the American Society for Quality (ASQ) section 3.3.1 of SSPC-QP 1.

SSPC Coating Application Specialist Level 2–Certification Program (CAS) (Interim & Full Status)

The SSPC Coating Application Specialist (CAS) Certification Program allows those in the current workforce the opportunity to realistically achieve certification during the next several years. It provides criteria for the education, training, experience, knowledge, and motor skills required to prepare and apply protective coatings to steel and concrete surfaces of complex industrial and marine structures. The program requires passing a closed-book written exam drawn from the core areas of the SSPC Transition Plan Body of Knowledge. The hands-on portion of the testing certifies proficiency in abrasive blasting and coating application using conventional or airless spray.

Continued on p. 54

PACE Exhibitors

The following is a preview of the companies ready to showcase their goods and services to professionals in the protective coatings industry, including industrial, commercial, and residential painting contractors. As of press time, approximately 90 exhibitors had already signed up for PACE 2010. Contact Lorena Walker at walker@pace2010.com for more information.

• **Advanced Recycling Systems, Inc.** ARS sells, rents, supplies, and services abrasive blasting, vacuuming, and dust collection equipment. Lowellville, OH; phone: 330-536-8210; fax: 330-536-8211; www.arsrecycling. com. Booth 243.

• **Air Systems International, Inc.** has manufactured confined space ventilation kits, breathing air panels, portable filtration systems, and environmental products for the past 25 years. Chesapeake, VA; phone: 800-866-8100; fax: 800-247-5850; www. airsystems.com. Booth 631.

• **American Painting Contractor** is an educational and business resource that features new products, tips, and techniques for painting contractors. Richmond, VA; phone: 804-762-9600; fax: 804-217-8998; www.paintmag.com. Booth 414.

• **Arid-Dry by CDIMS** manufactures mobile desiccant dehumidifiers for temporary humidity control and constructive drying. Features include special filtration, cooling, and heating, and are available in 600-25,000 DFM supply volumes. Wixom, MI; phone: 248-344-7236; fax: 248-344-9401; www.cdims. com. Booth 730.

• **Armakleen Company** manufactures Armex® from Arm & Hammer®, a baking soda-based abrasive used for cleaning and preparing a variety of surfaces from steel to aluminum, masonry, wood, and glass. Princeton, NJ; phone: 609-497-7220; fax: 609-497-7176; www.armex.com. Booth 315.

• **Atlantic Design, Inc.** is an engineering and manufacturing firm that rents and sells new and used equipment and supplies for abrasive blasting. It also upgrades, retrofits, and troubleshoots existing equipment. Abingdon, MD; phone: 866-225-5234; fax: 866-266-2600; www.calladi.com. Booth 443.

• **AXXiom Manufacturing, Inc.™** provides Schmidt® abrasive blast equipment and other engineered air blast systems. Fresno, TX; phone: 800-231-2085; fax: 888-600-3300; www.axxiommfg.com. Booth 225.

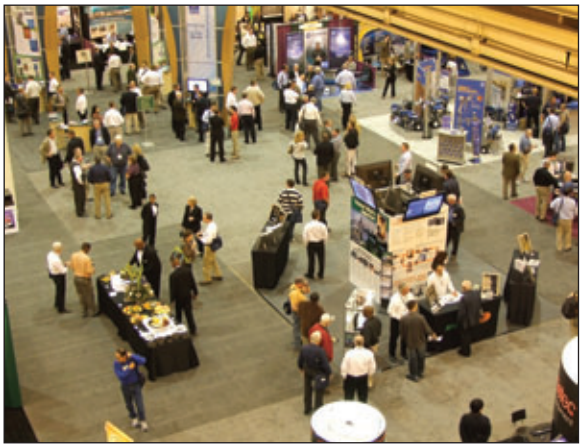
• **Behr Process Corporation** manufactures paints, decorative finishes, primers, stains, and surface preparation products. Behr® is a trusted name in quality and durability among homeowners and professional tradesmen. Santa Ana, CA; phone;

714-545-7101; fax: 714-241-1002; www.behr.com. Booth 901.

• **Benjamin Moore & Co.** manufactures a full line of premium, professional, and high-performance industrial coatings and services all aspects of the coatings business. Montvale, NJ; phone: 201-949-6216; fax: 201-949-6645; www.benjaminmoore.com. Booth 401.

• **BIC Alliance** publishes *BIC magazine*. The company is an interactive marketing and matchmaking firm specializing in the industrial, construction, safety, and environmental sectors. Kemah, TX; phone: 281-538-9996; fax: 281-538-9991; www.bicalliance.com. Booth 226.

• **Carboline Company** supplies high-performance coatings, linings, and fireproofing products around the world through continuous technological improvements and first class service. St. Louis, MO; phone: 800-848-4645; fax: 314-587-2697; www.carboline.com. Booth 301.



• **CESCO** manufactures Aqua Miser B.O.S.S. ultra-high-pressure water blasting systems and supplies abrasive blasting, painting, and safety equipment. Charleston, SC; phone: 843-760-3000; fax: 843-760-3500; www.blastandpaint .com. Booth 410.

• **CHLOR*RID International Inc.** furnishes the coatings industry with a complete line of products for soluble salt detection and removal. Chandler, AZ; phone: 480-821-0039; fax: 480-821-0364; www.chlorrid.com. Booth 628.

• **Clemco Industries Corp.** manufactures abrasive blast equipment and related products, including portable blast machines, specialty blast products, operator safety equipment, blast cabinets, recovery systems, and blast rooms. phone: 636-239-0300; fax: 636-239-0788; www.clemcoindustries.com. Booth 505.

• ***CoatingsPro Magazine*** offers an in-depth look at coatings through case studies, successful business operation, new products, industry news, and the safe and profitable use of coatings and equipment. San Diego, CA; phone: 858-490-2708; fax: 858-272-0622; www.fourpointpub.com. Booth 935.

• **Comex Group** has industrial and commercials coatings that demonstrate proven performance in the field. The company develops and manufactures products including epoxies, polyurethanes, acrylics, and alkyds. phone: 720-873-3060; fax: 720-873-3070; www.thecomexgroup.com. Booth 601.

• **Corona Brushes, Inc.** is a third-generation, family-owned company that manufactures handcrafted, professional-quality paint applicators. Tampa, FL; phone: 813-885-2525; fax: 813-882-9810; www.coronabrushes.com. Booth 923

• **Dampney Company Inc.** designs, develops, manufactures, and distributes engineered coating systems for specialized applications. It services the refining, petrochemical, pipeline, power, offshore, OEM, and pulp and paper industries worldwide. Everett, MA; phone: 617-389-2805; fax: 617-389-0484; www.dampney.com. Booth 801.

• **DECO-Custom Publishing Design Group** publishes custom four-color magazines for associations. St. Louis, MO; phone: 800-332-7322; fax: 314-514-9417; www.pdca.org. Booth 1041.

• **DeFelsko Corporation** is a U.S. manufacturer of PosiTector 6000, PosiTest, and PosiPen coating thickness gages and inspection instruments, including adhesion testers, dew point meters, and wall thickness gages. Ogdensburg, NY; phone: 315-393-4450; fax: 315-393-8471; www.defelsko.com. Booth 521.

• **Dehumidification Technologies, Inc.** rents or permanently installs desiccant and equipment for industrial projects. The company has highly trained and fully qualified technicians. Houston, TX; phone: 713-939-1166; fax: 713-939-1186; www.rentdh.com. Booth 806.

• **DESCO Mfg. Co., Inc.** manufactures dust-free surface preparation tools designed to remove and contain lead, asbestos, silica, and beta hot spot decontamination with minimal secondary engineering controls. Rancho Santo Margarita, CA; phone: 949-858-7400; fax: 949-858-9141; www.descomfg.com. Booth 707.

• **Detroit Tarpaulin, Inc.** has manufactured tarps, covers, and custom enclosures for 40 years. It will display materials used nationwide for containing lead from abatement and construction projects. Romulus, MI; phone: 800-457-5054; fax: 734-955-8208; www.detroittarp.com. Booth 823.

• **Doosan Portable Power**, formerly Ingersoll Rand, offers a full line of portable air compressors for blasting and painting, as well as dryers, generators, and lighting systems. Statesville, NC; phone: 704-883-3764; fax: 704-883-3770; www.doosanportablepower.com. Booth 1010.

• **DRYCO** provides industrial climate control for the blasting and coating industry, specializing in desiccant and SubCool dehumidification, cooling, heating, and temporary power. Northlake, IL; phone: 866-379-2600; fax: 708-531-9906; www.drycogroup.com. Booth 311.

• **Eagle Industries** will display a variety of environmental products, including hygiene facilities, negative pressure units, protective clothing, monitors, and enclosures for industrial applications. Harahan, LA; phone: 504-733-5310; fax: 504-733-3552; www.eagleind. com. Booth 310.

• **Elcometer, Inc.** will showcase and demonstrate its entire line of inspection equipment for paint and protective coatings, such as adhesion testers, surface profilers, and holiday/pinhole detectors. Rochester Hills, MI; phone: 248-650-0500; fax: 248-650-0501; www.elcometer.com. Booth 623

• **Faux Effects International Inc.** offers over 300 waterborne, professional grade, decorative finishing mediums. It offers a healthy alternative to hazardous, toxic materials. Vero Beach, FL; phone: 800-270-8871; fax: 772-778-9653; www.fauxfx.com. Booth 210.

• **Fischer Technology, Inc.** offers handheld coating thickness gages, including Dualscope® FMP10 and FMP30 and Iscoscope® FMP10 and FMP30. They have a large graphic display with shock-resistant casing. Windsor, CT; phone: 860-683-0781; fax: 860-688-8496; www.fischer-technology. com. Booth 200.

• **FS Solutions** provides high-performance parts and accessories for waterblasters and industrial vacuum loaders, as well as rentals and refurbished equipment. Trained technicians can repair and rebuild equipment. Elgin, IL; phone: 800-822-8785; fax: 205-699-2253; www.fssolutionsgroup.com. Booth 205.

• **Paul N. Gardner Co. Inc.** will have sign-ups for the free, new 74th anniversary catalog at the booth. It is a must-have for coating and testing needs. Pompano Beach, FL; phone: 954-946-9454; fax: 954-946-9309; www.gardco.com. Booth 407.

• **Graco Inc.** supplies coating pumps, airless and air-assisted spray systems, plural-component proportioners, and application equipment. Rogers, MN; phone: 612-623-6726; fax: 612-375-3593; www.graco.com. Booth 426.

• **Greenhorne & O'Mara, Inc. (G&O)** provides highway bridge coatings consulting and inspection. Services include coatings and corrosion condition assessments, failure analysis, design specifications, and coatings inspection. Laurel, MD; phone; 240-542-3133; fax: 240-542-3193; www.g-and-o.com. Booth 224.

• **Greenman-Pedersen, Inc.** is an engineering/architectural design and construction firm that provides multi-disciplined services to various industries. Afflilate companies include GPI Instrument Sales, GPI Underwater Engineering Services, and CCC&L. Port St. Lucie, FL; phone: 772-337-3080; fax: 772-337-0294; www.gpinet.com. Booth 413.

• **HippWrap Containment, Inc.** manufactures Hippwrap containment systems for shrink-wrap containment, enclosures, and protective coverings. The company offers creative solutions to containment problems. San Diego, CA; phone: 800-362-4477; fax: 858-541-1580; www.hippwrap.com. Booth 406.

• **Hi-Temp Coatings Technology** manufactures a wide variety of industrial and O.E.M heat-resistant coatings, including Hi-Temp 1027. Acton, MA; phone: 978-635-1110; fax: 978-635-1124; www.hitempcoatings.com. Booth 835.

• **HoldTight Solutions Inc.** manufactures HoldTight®102 Salt Remover/Flash Rust Inhibitor. It is non-hazmat and biodegradable and can be dissolved in water to pressure wash any surface, prevent rust, and degrease. Houston, TX; phone: 713-266-9339; fax: 713-266-1022; www.holdtight.com. Booth 735.

• **Indian Valley Industries, Inc.** offers industrial fabrics for all containment needs. Its products are used for the containment of lead blast media, debris, dust, and overspray, and pollution control on waterways. Johnson City, NY; phone: 800-659-5111; fax: 607-729-5158; www.iviindustries.com. Booth 610.

• **Industrial Vacuum Equipment Corp.** manufactures the Hurricane line of industrial vacuum loaders. Its nationwide fleet includes vacuums, dust collectors, and steel grit recyclers. Ixonia, WI; phone: 920-261-1136; fax: 920-261-7117; www.industrialvacuum.com. Booth 743.

• **Just Like New Overspray** specializes in removing overspray such as paint, concrete, chemicals, and stains from boats, cars, buildings, and planes. Gulfport, MS; phone: 228-617-3322; fax: 228-868-9155; www.justlikenew-overspray.com. Booth 611.

• **Kelly-Moore Paint Co.** provides the finest quality paints, coatings, and supplies to the professional trades at fair prices. Come see what's new for 2010 at PACE. San Carlos, CA; phone: 800-874-4436; www.kellymoore. com. Booth 614.

• **Kennametal, Inc.** manufactures high-production abrasive blast nozzles. It offers a wide selection of conventional and specialty blast nozzle designs in a variety of wear-resistant materials. Traverse City, MI; phone: 231-946-2100; fax: 231-946-3025; www.kennametal.com. Booth 533.

• **Kleen Blast Abrasives** is a large distributor of slag, specialty abrasives, and sand blasting parts and equipment. It supplies all abrasives and equipment needs and ships anywhere. San Ramon, CA; phone: 925-831-9000; fax: 925-831-9183; www.kleenblast.com. Booth 834.

• **KTA-Tator, Inc.**, a consulting engineering firm, provides coatings and steel fabrication inspection services, laboratory testing, coating failure analysis, training, corrosion surveys, environmental health and safety services, and distributes inspection instruments. Pittsburgh, PA; phone: 412-788-1300; fax: 412-788-1306; www.kta.com. Booth 904.

• **Line-X Protective Coatings** is a developer, applicator, and innovator of highly durable spray-on polyurethane polyurea elastomer coatings for the truck/vehicle, commercial, industrial, agricultural, military, and marine markets. Santa Ana, CA; phone: 714-850-1662; fax: 714-850-8759; www.line-x.com. Booth 416.

• **Marco** is a single-source solution for surface preparation products and services. It has branches and distribution facilities in several U.S. locations. Davenport, IA;

phone: 563-324-2519; fax: 563-324-6258; www.marcousa.com. Booth 719.

• **McCauley Tools LLC** will showcase its patented line of painting tools for painting the high and difficult to reach areas involved in every painting project. Mammoth Lakes, CA; phone: 760-934-6134; fax: 760-692-4444; Booth 206.

• **Microblend Technologies** invented, developed, and patented the automated paint machine® (APM®). The company also offers interior/exterior paints and primers. Gilbert, AZ; phone: 480-831-0757; fax: 480-892-0385; www.microblendtechnologies.com. Booth 933.

• **Mohawk Garnet Inc.** produces garnet abrasives for all surface preparation and waterjet cutting needs. Wahnapitae, ON; phone: 705-694-5783; fax: 705-694-5575; www.mohawkgarnet.com. Booth 211.

• **Monarflex by Siplast** offers the Super T-Plus and Super T-Plus Flamesafe Scaffold Sheeting Systems that have a patented grommet system and are easy to install, durable, and come in several lengths. Irving, TX; phone: 469-995-2200; fax: 469-995-2249; www.siplast.com. Booth 706.

• **Montipower, Inc.** will showcase the MBX Bristle Blaster, a power tool that removes corrosion, scale, and coatings, and imparts a 3-mil profile. Boyce, VA; phone: 877-629-8777; fax: 954-337-3889; www.mbxit.com. Booth 912.

• **Munters Corp.** specializes in water damage recovery. The company has a large fleet of dehumidification equipment and the experience to solve document/structure drying projects. Glendale Heights, IL; phone: 800-686-8377; fax: 978-241-1274; www.munters.com. Booth 515.

• **Murphy Industrial Coatings** specializes in the field application of coatings and linings. Signal Hill, CA; phone: 562-427-7720; fax: 562-426-6751; www.murphy.ac. Booth 805.

• **NACE International** is a corrosion engineering society dedicated to promoting public safety, protecting the environment, and reducing the economic impact of corrosion. Houston, TX; phone: 281-228-6200; fax: 281-228-6300; www.nace.org. Booth 937.

• **National Equipment Corporation** will have its Neco Blast Couplings and complete product line on display. Brenham, TX; phone: 979-830-8030; fax: 979-830-0983; www.hosecoupling.com. Booth 428

• **NexTec Inc./PreTox Systems** markets PreTox 2000, a cost-effective system for rendering lead waste non-hazardous during abatement. The system works with all standard removal methods, including abrasive and mechanical. Dubuque, IA; phone: 800-338-8296; fax: 563-589-1237; www.pretox.com. Booth 910.

• **Novatek Corp.** supplies and manufactures needle scalers, long-reach scalers, and special tool and vacuum systems (TVS) for removing and recovering hazardous materials such as lead-based paint. Exton, PA; phone: 610-363-7800; fax: 610-363-9620; www.novatekcorporation.com. Booth 516.

• **Opta Minerals Inc.** produces silica-free slag abrasives from

plants across North America and distributes blasting abrasives such as garnet, steel grit, aluminum oxide, glass beads, and walnut shells. Waterdown, ON; phone: 847-439-4404; fax: 847-439-4425; www.optaminerals. com. Booth 922.

- **The Paint Detectives™** provides consulting, R&D, and expert witness services, including paint defect inspection, coatings failure analysis, product development, performance testing, and reverse engineering. Evanston, IL; phone: 847-475-2755; fax: 847-475-3545; www.thepaintdetectives.com. Booth 317.
- **Paint Sundry Brands, Purdy/Bestt Liebco** produces high-quality painting tools. Its handcrafted brushes and high-quality roller covers have been the choice of professionals for over 80 years. Portland, OR; phone: 503-286-8217; fax: 503-286-5336; www.purdycorp.com. Booth 300.
- **Painters & Allied Trades LMCI** focuses on expanding industry programs that enhance the market share and work opportunities for the International Union of Painters and Allied Trades and the Finishing Contractors Association. Hanover, MD; phone: 202-637-0798; fax: 410-782-7166; www.iupat.org. Booth 216.
- **PDCA** will display membership information, educational materials, publications, and new products, including PACER estimating demonstrations. Special product and publication discounts will be available on-site. St. Louis, MO; phone: 800-332-7322; fax: 314-514-9417; www.pdca.org. Booth 1033.
- **PDCA Arizona Council** will have information about PDCA chapters in Arizona. Gilbert, AZ; phone: 480-988-3786; fax: 480-988-6511; www.pdcaz.org. Booth 1129
- **Pratt & Lambertt Paints** has a long tradition of providing discerning architects, designers, professionals, and homeowners the highest quality paints and color presentation. Cleveland, OH; phone: 216-566-3774; fax: 216-566-1655; www.prattandlambert.com. Booth 201.
- **Pro-Tect Plastic and Supply Inc.,** "America's Shrink Wrap Store," has shrink wrap supplies and equipment, including a premium 9-mil, flame-retardant and non-flame, 10.5-mil, flame-retardant films for environmental containment. Jacksonville, OR; phone: 800-889-WRAP; fax: 541-774-5508; www. shrinkwrapcontainments.com. Booth 513.
- **Quali-Tech Manufacturing Company** is a leading manufacturer of mini-roller covers and a supplier of a complete line of painting applicators and accessories. Rancho Domingo, CA; phone: 310-637-8900; fax: 310-763-2100; www.quali-techmfg.com. Booth 307.
- **Randy Seal, Inc.** has a full line of exterior wood care products for all wood restoration needs. Products include 80 Brightener, 123 Cleaner/Remover, and 125 Excellence. Lewisville, TX; phone: 972-434-2028; fax: 972-221-3237; www.readyseal. com. Booth 529.
- **Reed Minerals** manufactures the original Black Beauty® blasting abrasives that meet the industry standards for being chemically inert, low/free silica, low dusting, and high quality. Mechanicsburg, PA; phone: 888-733-3646; fax: 717-506-4646; www.reedmin.com. Booth 911.

• **Roman Decorating Products** is a manufacturer of wallcovering removers, adhesives, and primers. The company will be showing its latest addition to the primers and adhesives line with mildew protection. Calumet City, IL; phone: 708-891-0770; fax: 708-891-4746; www.romandecoratingproducts.com. Booth 619

• **SAFE Systems, Inc.** provides manufacturing, engineering, sales, parts, and service for its full line of portable and fixed blast facilities and equipment, and blasting, recovery, classification, and dust collection. Kent, WA; phone: 425-251-8662; fax: 425-251-8683; www.safesys.com. Booth 511.

• **Sauereisen** provides a worldwide product distribution of corrosion-resistant materials of construction and high-temperature cements. The company is dedicated to establishing expertise in prevention of corrosion and restoration. Pittsburgh, PA; phone: 412-963-0303; fax: 412-963-7620; www.sauereisen.com. Booth 411.

• **Sherwin-Williams**—from protective to commercial to residential coatings—is the source for quality paints and coatings, supplies, equipment, expert advice, and fast order turnaround. Cleveland, OH; phone: 800-254-5979; fax: 440-826-1989; www.sherwin-williams.com. Booth 420.

• **Sponge-Jet, Inc.** manufactures dry, low-dust, reusable Sponge Media™ composite abrasives, bonding conventional abrasives with polyurethane sponge. Portsmouth, NH; phone: 603-610-7950; fax: 603-431-6043; www.spongejet.com. Booth 607.

• **SSPC: The Society for Protective Coatings** will feature information and samples of products and services, including a full line of public and on-site training offerings; quality-assurance programs, with professional certification for all aspects of the painting and coating industry; SSPC membership; a wide range of publications and videos; and SSPC-branded apparel and gift items. Please stop by to learn more about our new line of eCourses, including short courses on Steel & Concrete Surface Prep. Also, check out our new ebook version of the popular SSPC Pocket Guide for Amazon Kindle and Sony ereader. Pittsburgh, PA; phone: 877-281-7772; fax: 412-281-9992; www.sspc.org. Booth 133.

• **SSPC Arizona Chapter** is one of many SSPC local chapters in the U.S., Canada, and Asia that enable members to interact with other protective coatings industry decision-makers closer to home. This active chapter holds local events like dinner meetings, training courses, trade shows, and golf outings. Chapters give members more chances to get involved with the organization, make contacts, and further their professional interests all at the same time. Contact at 623-414-1841; fax: 623-414-1841. Booth 732.

• **STAR4DEFENSE** provides customized training and certification to DoD military spray painters through hands-on, classroom, and virtual simulation learning. Cedar Falls, IA; phone: 319-277-4668; fax: 319-268-3733; www.star4defense.org. Booth 233.

• **3M** has a Construction and Home Improvement Markets Division that manufactures abrasives as well as safety, tape, and masking systems for the professional painter. St. Paul, MN; phone: 651-737-3678; fax: 651-575-0840; Booth 620.

• **Tank Industry Consultants** offers engineering services for new and existing water storage tanks. Its staff has a reputation for being water storage tank experts. Indianapolis, IN; phone: 317-271-3100; fax: 317-271-3300; www.tankindustry.com. Booth 900

• **Tarps Manufacturing, Inc.** is a custom tarpaulin manufacturer for ground tarps, containment, building wraps, and strong nylon and poly mesh. Tarps are custom sewn to size, hemmed, grommeted, and strapped. Meredosia, IL; phone: 217-584-1900; fax: 217-584-1905; www.tarpsmfg.com. Booth 329.

• **Tarps & Tie-Downs** is a manufacturer and distributor of covers, canopies, tarps, industrial materials, cargo control systems, and wheelchair products. The company has a large inventory of fabric materials. Haywood, CA; phone: 510-782-8772; fax: 510-782-8774; www.tarpstiedowns.com. Booth 514.

• **Titan Spray Tech** manufactures airless spray equipment for commercial, industrial, residential, and architectural uses. The company will display its PowerLiner8900 portable line striper. Franklin Lakes, NJ; phone: 800-526-5362; fax: 800-528-4826; www.titantool.com. Booth 711

• **Tnemec Company, Inc.** makes high-performance coatings for industrial and architectural applications on steel, concrete, masonry, and other substrates. Kansas City, MO; phone: 816-483-3400; fax: 816-483-3969; www.tnemec.com. Booth 506

• **Trimaco, LLC** offers drop cloths, masking products, protective wear, building and flooring papers, painter's apparel, wiping products, and other paint sundries for total jobsite protection. Durham, NC; phone: 314-534-5005; fax: 314-531-1723; www.trimaco. com. Booth 927.

• **TriTech Industries, Inc.** manufactures industrial and commercial airless spray equipment, including spray guns, tips, and all related accessories. All products are manufactured in the U.S., with worldwide distribution. Union, NJ; phone: 908-378-1080; fax: 908-378-1659; www.tritechindustries.com. Booth 510

• **Van Air Systems** makes equipment that dries and purifies compressed air used for applying and removing coating

systems. Lake City, PA; phone: 800-840-9906; fax: 814-774-0778; www.vanairsystems.com. Booth 612.

• **Venture Africa International LTD** focuses on investors and project financing groups worldwide. Products include standard bank verification, money market, and bank account options. Accounts available from $100K-$5 billion. Guana, South Africa; phone: 208628690; fax: 21787322; www.vailgh.com. Booth 1101.

• **Western Technology Inc.** manufactures explosion-proof and low-voltage lighting, including the Mighty Light LED product line, and a complete line of deadman controls. Bremerton, WA; phone: 800-654-5483; fax: 360-917-0083; www.westerntechnologylights.com. Booth 811.

• **The Wooster Brush Company** was founded in 1851 and manufactures paintbrushes, rollers, surface prep tools, extension poles, minirollers, and paint trays. Brand names include Alpha™, Ultra/Pro®, Super/Fab®, Pro/Doo-Z®, and Sherlock®. Wooster, OH; phone: 800-392-7246; fax: 330-263-0495; www.woosterbrush.com. Booth 817.

• **XIM Products, Inc.** manufactures specialty primers, sealers, coatings, coatings additives, and surface preparation products. It is known for its bonding primers that bond tough-to-paint surfaces. Westlake, OH; phone: 440-871-4737; fax: 440-871-3027; www.ximbonder.com. Booth 821.

• **Zinsser Brands/Rust-Oleum Corporation** manufactures and markets a full line of primer-sealers, wallcovering products, wood finishes, concrete and masonry products, decorative finishes, and products for the prevention of mold and mildew. Vernon Hills, IL; phone: 847-367-7700; fax: 847-816-2330; www.zinsser.com. Booth 916. **JPCL**

Vulcan Painters Achieves Historic First

SSPC has announced that Vulcan Painters, Inc., of Bessemer, AL, is the first coatings contracting company to meet the certification requirements of the new SSPC-QP 9 program for architectural coatings work and the new QS 1 certification program on advanced quality management. In addition, Vulcan is the first contracting company to achieve six SSPC Quality Program certifications at one time, including QP 1 (complex structures), QP 2 (lead paint abatement), QP 3 (shop painting), QP 8 (polymer coatings for concrete), QP 9, and QS 1.

David Boyd

David Boyd, the company president, said "Vulcan Painters started its commitment to quality systems nine years ago with ISO 9001 certification, and in 2005 we hired a full-time manager of quality systems. Our groundwork and training have paid off this year with our six SSPC certifications, which demonstrate our technical ability in addition to our management capability. Our quality management and our employees have made this achievement possible with their hard work, and deserve the credit."

SSPC-QP 9 (Standard for Evaluating Qualifications of Painting Contractors Who Apply Architectural Paints and Coatings) contains requirements for evaluating the qualifications of painting contractors who apply architectural coatings on commercial or institutional structures, and defines a minimum standard for qualification.

SSPC-QS 1 (Standard Procedure for Evaluating a Contractor's Advanced Quality Management System) is the standard procedure in the SSPC Painting Contractor Certification Programs (PCCP) that requires participating contractors to implement and document more stringent (ISO 9001-Compliant) quality control and record-keeping procedures than those included in SSPC Quality Program certifications such as QP 1 and QP 3. However, unlike ISO 9001 certification, QS 1 provides the facility owner with the dual benefit of a coatings-industry specific quality management system (QMS) model for contractors who have the operational capability required by QP 1 plus the ISO 9001-compliant QMS detailed in QS 1.

Vulcan Painters, Inc. is a painting contracting firm specializing in commercial and industrial painting projects, as well as blasting and coating structural steel and pipe. Its projects include coatings work on paper mills, stadiums, power plants, sewer pipes, floors, college buildings, hospitals, churches, and historic landmarks. Vulcan is the 17th largest painting contractor in the nation, according to *Engineering News Record*, and one of only a few painting contractors to earn ISO certification. Vulcan has been an SSPC Organizational Member since 1983.

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SSPC Certifies Two as Protective Coating Specialists

SSPC has announced that Curly J. Cohran of Prairieville, LA, and Stuart McGovarin of Alliston, ON, Canada have been certified as Protective Coatings Specialists (PCS).

Curley Cohran

Stuart McGovarin

SSPC's PCS Certification recognizes industrial coating professionals for their extensive knowledge in the principles and practices specific to industrial coatings technology. Each coatings professional is evaluated on his or her mastery of coatings type, surface preparation, coatings application and inspection, contract planning/management, development of specifications, and the economics of protective coatings.

To be certified under the PCS Certification Program, each industrial coatings professional is first evaluated for his or her education and work experience to determine the extent of training to be completed before taking the comprehensive written exam.

Training courses commonly completed before taking the exam are the SSPC Fundamentals of Protective Coatings for Industrial Structures (C-1) and SSPC Specifying and Managing Protective Coating Projects (C-2), or courses of a similar content. The final step in certification is the successful completion of SSPC's comprehensive examination of the coating professional's use and knowledge in those areas.

Training Roundup

SSPC has reported on three of its courses recently held in the U.S.

Students at BCI course in Orlando, FL, September

SSPC's Bridge Coating Inspector (BCI) course was hosted September 14–19 by Parsons Transportation Group in Orlando, FL. Said Bryan Rerko, P.E., senior project engineer at Parsons, "The course did meet our expectations. It was very informative and well presented. Of particular interest were the steel samples used ... to identify different preconditions and surface preparations. The training will assist our managers and inspectors on the next coatings projects in regards to steel bridge structures."

Students at NBPI course in San Diego, CA, September

SSPC also held its NAVSEA Basic Paint Inspector (NBPI) Course September 14–18. The course was hosted by the US Navy Southwest Regional Maintenance Center in San Diego, CA. Seventeen students attended and the instructors were Gordon Kuljian and Dennis Brown.

SSPC held its Fundamentals of Protective Coatings (C-1) course September 14–18 in Portland, OR. Gunderson Inc. hosted the course, which was attended by 20 students and led by instructor Web Chandler. Gunderson supervisor Walter Stokman said "The SSPC C-1 class was very beneficial to the individuals that participated in the class. In addition, the class will be beneficial to the entire paint group, because the participants are sharing the information they learned with their coworkers. The participants of the class are looking forward to the C-2 class and eventual PCS certification."

SSPC Individual Member Update

Persons who joined or renewed their SSPC membership in July 2009 are listed on p. 68.

SSPC Individual Membership bene-

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fits include unlimited access to the online collection of SSPC standards and other exclusive "members only" web content; a subscription to *JPCL*; discounts on SSPC products and services; and opportunities to network with other professionals at SSPC Local Chapter activities and national events, such as PACE 2010.

For information about joining, contact Terry McNeill, mcneill@sspc.org.

- Jorge Araujo, Nova Iguaçu, Brazil
- Eva Armitage, Clinton Township, MI
- Don Backman, Carson City NV
- Peter Bakke, Waukehsa, WI
- John Barnes, Castle Rock, CO
- Peter Bending, Menominee, MI
- John Breton, Aistom, TX
- Catherine Britell, Newark, NJ
- Joshua Burchett, Roswell, NM
- Stephen J. Capone, Rowley, MA
- Keith Charest, Cambridge, ON, Canada
- Tony Collins, Sims, NC
- Greg Crider, Shippensburg, PA
- Michael Dadik, Walnut Creek, CA
- Michael Deaton, Noel, MO
- Don Dixon, Draper, UT
- Alain Gamache, Baie-Comeau, QC, Canada
- Cipriano Guzman, Closter, NJ
- Linda Hall, Pikeville, NC
- Tim Holbrook, Morrison, CO
- Nitin Jain, New Delhi, India
- Wong Soo Jeen, Shah Alam, Selangor, Malaysia
- Joseph LeClair, Cocoa, FL
- Don Leyes, Burnaby, BC, Canada
- Mary Louden, Newport News, VA
- Brad Lyden, Topeka, KS
- Joe Mathias, Hamilton, ON, Canada
- Jimmie Meeks, Otto, NC
- Jack Mershon, Houston, TX
- Nwachukwu Boniface Nnaya, Port Harcourt Rivers, Nigeria
- Jenkins Odoms, Temple Hills, MD
- Edward Pearce, Broken Arrow, OK
- Theerasak Phadungsri, Muang Samutphrakarn, Thailand
- Bill Pofahl, Independence, KY
- Richard J. Pyles, Mobile, AL
- Abigail Rivera, Toa Alta, PR
- Ralph Roseburg, Salem, OH
- David Rypien, Houston, TX
- Douglas Schul, Emmaus PA
- Tod Schwartz, Holland, MI
- James Sellers, Bonifay, FL
- Gopal K.C.Sharma, Batangas City, Philippines
- David Spear, Boswell, PA
- Robert Speck, Calgary, Canada
- Chelsea Teall, Berkeley, CA
- Kevin Tornatore, Lawrenceburg, IN
- Kostas Tripolitis, Chios Chhios, Greece
- Lisa Ursino, Johnstown, PA
- Richard Vandagriff, Pearland, TX
- Ramanan Venkatesan, Chennai, India
- Jeff Vosburg, Lewisville, TX
- Charles N. Watson, Fayetteville, AR
- Albert Wynn, FPO, AP

associations

WorkBoat Show Returns to New Orleans

The International WorkBoat Show will return to New Orleans, LA, this year with new exhibitors, new products, and a new coatings session. Sponsored by *WorkBoat* magazine, the show will be held at the Morial Convention Center, Dec. 2–4. According to the show, WorkBoat is the largest commercial marine tradeshow in North America and plans to have 1,000 companies displaying products and services.

One session this year that may be of particular interest to industrial and marine coatings professionals is "Advances in Coating Technology." Speaker Mark Schultz will present this session on Thursday, Dec. 3, from 4–5:00 p.m. He will discuss U.S. Navy-initiated programs to reduce coating application time and cost, enhance coating longevity, and introduce green technologies. The presentation reviews multiple new technologies including single-coat, edge-retentive, rapid-cure tank linings utilizing optically active pigments for enhanced QA/QC. Also being presented are new "green" heavy metal-free antifoulant technologies that do not leave an environmental footprint and advances in cartridge-based delivery tools.

For more information about the show, or to register, visit www.workboat.com.

The exhibition at WorkBoat will feature many companies involved in the manufacture, supply, and application of marine and protective coatings. The following is a list of such companies known to *JPCL* as of press time.

• Barton Garnet Abrasives (Booth 3228) makes a range of garnet abrasives to increase productivity while reducing abrasive consumption.

• Carboline Company (Booth 2821) offers a comprehensive product line for solving marine/offshore corrosion problems through protective coatings and linings.

Photo courtesy of New Orleans Metropolitan Convention and Visitors Bureau and photographer Richard Nowitz.

• CHLOR*RID International, Inc. (Booth 1771) is a leading source of products and information for soluble salt testing and removal.

• COTE-L Industries, Inc. (Booth 2627) manufactures slip-resistant, protective safety coatings; detectable warning systems; and fire-retardant technology.

• Dalseide Inc (Booth 2928) is the U.S. company of Dalseide Shipping Services, which manufactures Rustibus maintenance equipment.

• Damrich Coatings, Inc. (Booth 3003) has been servicing the marine and industrial industry for 26 years.

• Eagle Industries (Booth 176) is an international provider of products and services for containment and ventilation.

• Epmar Corporation/Syndeck (Booth 3330) specializes in ultra lightweight marine products for interior decking.

• Hempel (USA), Inc. (Booth 2530) develops and produces high-standard paints and coatings, including fouling-release coatings for the marine industry.

• ITW Polymer Technologies (Booth 1820) is a manufacturer of high-quality, polymer-based chocking, coatings, repair compounds, and other specialized products.

• Jotun Paints, Inc. (Booth 2113), the North American affiliate and subsidiary of the Jotun Group, produces and supplies products to the following market segments: foreign and domestic marine and shipping, offshore, and military.

• Mascoat Products (Booth 2204) offers off-the-shelf insulating coatings as well as fully customized insulating coatings in the industrial, marine, commercial, and residential markets.

• PolySpec LP (Booth 2660) provides specialized marine deck coating technologies designed to meet the requirements and demands of offshore living accommodations and work spaces.

• PPG Protective & Marine Coatings (Booth 1431) is a supplier of high-performance coatings and fireproofing for marine and offshore applications worldwide.

• Sherwin-Williams (Booth 2249) offers a broad line of high-performance coatings, comprehensive technical service and a large distribution system.

• Sponge-Jet, Inc. (Booth 430) manufactures clean, dry, low dust, and recyclable Sponge Media™ abrasives and blasting systems.

• Wooster Brush Company (Booth 157) manufactures paintbrushes, paint rollers, roller frames, extension poles, buckets and trays, and surface prep tools.

Continued

companies

Int'l Paint Names PC Manager, Canada

International Paint LLC (Houston, TX), part of AkzoNobel, has promoted Darrin Andrews to the position of protective coatings manager, Canada.

Andrews will be responsible for leading the protective coatings business throughout Canada, including all business development, sales, engineering sales, and marketing activities specific to Canada.

Darrin Andrews

Previously, Andrews was the Canadian director of industrial coatings sales for Devoe High Performance Coatings, also part of AkzoNobel. Devoe and International Paint are nearly halfway through a two-year effort to integrate the Devoe business with the International Paint protective coatings business.

Dow Opens New Elastomers Lab

The Dow Chemical Company (Midland, MI) announced the opening of a new laboratory for the Elastomers Business. The lab is located at Dow's Freeport, TX, R&D facility. It is used for the compounding, mixing, processing, and testing of thermoset elastomers. The lab complements the existing polymer analysis, material science, and physical testing capabilities at the site in support of Dow Elastomers technical service, application development, and research and development of polymer products.

Dow also is in the final stages of completing a 25 million-pound debottleneck project at its Plaquemine, LA, ethylene-propylene-diene monomer (EPDM) site. The project will be completed in first quarter 2010. The plant will continue to operate at full rates during the project. EPDM production is important to the company's elastomers business, according to Luis Cirihal, business director at Dow Elastomers, who said, "We will continue to invest to meet growing demand of our customers."

Bayer Announces Management Changes

Dr. Marijn E. Dekkers

On September 14, 2009, Bayer AG's Supervisory Board appointed the company's future management line-up. Werner Wenning, Bayer AG CEO since 2002, announced his decision to extend his contract of service by 8 months to September 30, 2010. The Supervisory Board appointed Dr. Marijn E. Dekkers to succeed Wenning as CEO, starting October 1, 2010. Dekkers is currently the president and CEO of Thermo Fisher Scientific Inc.

Dekkers will join the Bayer Management Board on January 1, 2010, and, in a transition phase, will also serve as CEO of Bayer HealthCare, succeeding Arthur J. Higgins, who has decided to leave the company dur-

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ing the first half of 2010 for personal reasons. Higgins was appointed chairman of the Bayer HealthCare Executive Committee on July 1, 2004, and has been CEO of Bayer HealthCare AG since January 1, 2006.

CFO Klaus Kühn plans to take an early retirement following the annual stockholders' meeting on April 30, 2010. The Supervisory Board has appointed Werner Baumann, currently a member of the Board of Management and Executive Committee of Bayer HealthCare, to be Kühn's successor. Baumann will also join the Bayer Management Board on January 1, 2010.

Bayer AG is headquartered in Leverkusen, Germany. U.S.-based Thermo Fisher Scientific is headquartered in Waltham, MA.

AkzoNobel to Realign Units, Shift Directors

Global coating and chemical maker AkzoNobel (Amsterdam, the Netherlands) has announced plans to introduce more balance to its Performance Coatings and Specialty Chemicals portfolios as part of a realignment that will see the launch of two new business units and the merger of two others.

Due to come into effect on January 1, 2010, the planned changes include the creation of a stand-alone Wood Finishes and Adhesives business and a restyled Industrial Coatings business, while the company's Polymer Chemicals activities will be merged into the Functional Chemicals organization.

Wood Finishes and Adhesives will comprise the company's current wood finishes and wood adhesives activities, while Industrial Coatings will be made up of the present Packaging Coatings, Coil Coatings, and Specialty Plastics operations, creating a more logical combination of AkzoNobel's industrial OEM businesses. In addition, to benefit more from its inherent technology and supply chain synergies, AkzoNobel Aerospace Coatings will transfer from Marine and Protective Coatings to Car Refinishes.

In the new structure, Bob Taylor (currently managing director of Industrial Finishes) will become managing director of Marine and Protective Coatings, succeeding Bill McPherson, who is due to retire in April, 2010. John Wolff (currently general manager of the Coil Coatings business) will become managing director of the new Wood Finishes and Adhesives business, while Conrad Keijzer (currently managing director of Packaging Coatings) will become managing director of the new Industrial Coatings business.

The merger of Polymer Chemicals into Functional Chemicals is designed to create a stronger, more cost-efficient business better equipped to sustain future growth, according to AkzoNobel. Bob Margevich will continue in his role as managing director of Functional Chemicals and will lead the new business once the activities are combined. Alan Kwek, managing director of Polymer Chemicals, will continue to be responsible for the Polymer Chemicals business until the end of 2009. Kwek, who has been with the company for more than 20 years, has announced that he will then leave AkzoNobel to return to Singapore.

Chase Corp. Acquires C.I.M

Sealant and coating manufacturer Chase Corporation (Bridgewater, MA) has acquired 100% of the capital stock of C.I.M. Industries, Inc. (C.I.M.), which makes high-performance coatings and membranes, according to a September 8 announcement from Chase.

With a primary focus on the water and wastewater indus-

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try, C.I.M. has products that complement Chase Corporation's product line of high-performance tapes and coatings, according to Peter R. Chase, CEO of Chase Corporation. "C.I.M. is consistent with our growth strategy of expanding our products and services to high-reliability coatings applications," he said.

C.I.M.'s liquid-applied liners and coatings are also used in chemical containment, deck and pavement waterproofing, cooling tower, and related applications.

Chase Corporation, founded in 1946, is a publicly traded company and a global manufacturer of tapes, laminates, sealants, and coatings for high-reliability applications.

C.I.M., a private manufacturer in business for more than 30 years, had revenues of $9.2 million in its most recently completed fiscal year, which ended December 31, 2008. The purchase was funded through a combination of cash, bank financing, and a note payable to C.I.M. shareholders.

For details, go to www.chasecorp.com and www.cimindustries.com.

products

Explosion-Proof Dehumidifier from XDH

The XDH Solutions Company (Montreal, Quebec) has introduced a portable, explosion-proof desiccant system, the patented XDH-2000 series.

The dehumidifier technology exceeds all strict safety requirements for offshore/onshore and military operations in hazardous locations in close proximity to flammable, volatile, and explosive environments, the company says. The new series is certified for CSA International/UL Class. 1—Div. 2, defined as "a location where a quantity of flammable gas or vapor, sufficient to produce an explosive or ignitable mixture, may

be present in the air" and "where a classified hazard is likely to exist" (www.csa-international.org). The series is also certified to ATEX Zone 2 in accordance with the European Commission's "Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres (ATEX) Directive 94/9/EC" (http://ec.europa.eu/enterprise/atex/index_en.htm).

The units have remote monitoring capabilities that allow for real time data and global management for complete humidity and environmental control. The series is also designed for higher efficiency in water vapor extraction, higher output capacity, and a wider climatic range of operation compared to other dehumidification equipment, the company says.

For details, visit www.xdhsolutions.com.

New Concrete and Steel Primer from Sherwin-Williams

The Sherwin-Williams Company (Cleveland, OH) has introduced Envirolastic® LT Primer, a fast-drying, low-viscosity polyurea primer for steel and concrete. According to the company, the primer can be applied in temperatures as low as 0 F.

At 77 F, surfaces can be recoated after one hour and after five hours at 40 F. It is ideal for low temperature applications, whenever a fast dry/fast coat recoat primer is required, and when polyurea and polyurethane topcoats are used, the company says.

The primer can be applied by brush, roller, or airless spray. It reduces the likelihood of pinholes or holidays in the coating film caused by outgassing from the concrete substrate.

For more information, visit www.sherwin-williams.com.

PCiRoads to Repair Missouri River Bridges

PCiRoads, LLC (St. Michael, MN) secured a contract from the South Dakota Department of Transportation to repair two bridges over Oahe Lake, an impounded portion of the Missouri River. PCiRoads, which specializes in structural repairs, steel fabrication, concrete repairs, waterproofing, and coatings application in the industrial, energy, and public sectors, was awarded $8,167,481.08 to perform various repairs on the 4,583-foot-long Forest City Bridge and the 5,058-foot-long Mobridge structure. The project includes cleaning and zone-painting a total of approximately 174,504 square feet of existing structural steel surfaces. The steel will be abrasive blast-cleaned to a Near-White finish (SSPC-SP 10) and coated with an organic zinc-epoxy-aliphatic urethane system from NEPCOAT List B or a zinc-urethane system from NEPCOAT List C. The project also includes a total of 12,500 linear feet of rust penetrating sealant application on pack rust. The coatings work includes erecting containment structures to control the emission of the existing lead-bearing coatings. The project also includes abrasive blast-cleaning and treating 27,634 square yards of bridge deck surfaces with a polysulfide epoxy chip sealant.

Photo courtesy of PCiRoads

Vimas Painting Will Recoat Roebling Bridge

Vimas Painting Company, Inc. (Campbell, OH), SSPC-QP 1-and QP 2-certified, was awarded a contract of $16,240,000 by the Kentucky Transportation Cabinet to recoat the John A. Roebling Suspension Bridge, a 2,161.5-foot-long structure that spans the Ohio River between Cincinnati, OH, and Covington, KY. The historic bridge, which was completed in 1866, features

a 1,057-foot-long main span. The project includes coating structural steel with a zinc-epoxy-urethane or moisture-cured urethane system, as well as coating bridge cables with an elastomeric acrylic system. The existing coatings are presumed to contain a significant amount of lead, necessitating Class 2A containment according to SSPC-Guide 6.

John A. Roebling Suspension Bridge

Corps of Engineers Awards Bulkhead Repair Contract

The United States Army Corps of Engineers, Philadelphia District, awarded a contract of $4,130,700 to Abhe & Svoboda, Inc. (Prior Lake, MN), SSPC-QP 1-and QP 2-certified, to repair and recoat 8,923 linear feet of steel sheetpile bulkhead along the Point Pleasant Canal, which connects the Manasquan River and Barnegat Bay. The contract includes installation of a unique cofferdam system to dewater the bulkhead. The steel bulkhead surfaces will be waterjetted, abrasive blast-cleaned to a Near-White finish (SSPC-SP 10), and recoated with a 100%-solids epoxy system.

City of Lakeland Lets Retention Basin Lining Project

The City of Lakeland, FL, awarded a competitively bid contract of $77,763 to Taylor's Industrial Coatings (Lake Wales, FL) to line two retention basins at the McIntosh Power Plant. The concrete basins will be abrasive blast-cleaned, repaired, and lined with a 100%-solids aromatic polyurethane coating system or a geomembrane liner system.

F.D. Thomas Wins Reservoir Roof Repair Work

F.D. Thomas, Inc. (Central Point, OR), SSPC-QP 1-and QP 2-certified, won a contract of $296,500 from the Eugene Water and Electric Board to perform joint repairs and waterproofing system application on the roof of a concrete reservoir. Approximately 56,000 square feet of concrete will be shot-blast-cleaned, repaired with a bughole filler, primed with an epoxy coating, and finished with a polyurethane waterproofing system.