

57th Annual

# Underground Corrosion Short Course

February 27 – March 1, 2018

Purdue University, West Lafayette, Indiana



**PURDUE**  
UNIVERSITY®

## Who Should Attend

Anyone interested in the causes of corrosion and its control should attend this course. Engineers, corrosion technicians, construction foremen, and maintenance foremen will find that this program fits their needs.

## Sections and Offerings

**General Session** – Fowler Hall in Stewart Center

**Practical Applications of Corrosion Control** – This course is designed for operators, field laborers, and supervisors that want a basic understanding of the concepts of corrosion. A lot of hands-on training and basic fundamentals will be addressed. A voluntary test will be offered at the conclusion of the course.

**Basic Section** – This section will provide a structured course, with an optional test. It is designed to assist in the preparation for the Cathodic Protection Tester Certification test. A voluntary test will be offered at conclusion of the course.

**Intermediate Section** – This section will present NACE and DOT criteria, an overview of pipeline coatings, and interference testing; a voluntary test will be offered at the conclusion of the course.

**Advanced Corrosion Section** – This section will present advanced techniques, materials, and design; a voluntary test will be offered at conclusion of the course

**NEW! NACE Corrosion Technician Review Course & Exam Proctoring** – The 4-hour review course will be Tuesday, February 27th from 11am to 4pm, with a one-hour break from 1pm to 2pm. This will allow participants to visit the hands-on section happening nearby. There will be two separate sessions allowed for the 2-hour proctored exam on Thursday, March 1st at either 12:30 to 2:30 or 3 to 5.0

A separate registration fee of \$99 will be charged to take the review course. This can be paid online at [www.conf.purdue.edu/corrosion](http://www.conf.purdue.edu/corrosion) or in person at registration. An Exam fee of \$100 will need to be sent to NACE with your exam. A \$200 application fee will need to be paid to NACE, to receive the certification (the application fee will not need to be paid until test results are received, which is an advantage to taking the exam at Purdue). Attendees of the review course will receive a printed copy of the review material.

This certification is geared towards personnel with at least 2 years of experience and who possess basic knowledge of corrosion and corrosion control and are capable of performing routine, well defined work under the close direction of Specialist or Senior Technologist personnel. Please go to the NACE website to review all certification requirements and recommended reference materials.

**Rectifier School** – Corrosion technicians can learn about the fundamentals of troubleshooting, maintenance, and operation of rectifiers. In the class, students will be able to work physically with the equipment. A voluntary test will be offered at the conclusion of the course.

**Coatings Section** – Surface preparation and coating fundamentals will be discussed. The course will address inspection techniques in the field and at the coating mill, knowledge of proper coating selection, and hands-on field application procedures. A voluntary test will be offered at the conclusion of the course.

**Internal Corrosion Section** – This course will be offered on Wednesday only. It will have industry experts presenting the latest information on internal corrosion.

**Pipeline Integrity** – This section discusses in-depth the various analytical tools available for determining the cause of pipeline wall loss and structure. As it relates to pipeline integrity, interpretation of DOT rule-making from transmission and distribution viewpoints will be discussed.

**Special Topics** – This section will address current issues and problems facing the industry, and will endeavor to find solutions.

**Hands-on Training Opportunity** – On Tuesday, February 27, from noon-3 p.m., there will be multiple hands-on training stations including ultrasonic instrument and pit gauge measurements, line locating, setting current interrupters in rectifiers, and taking the basic bond measurement. Students will learn how to properly operate the equipment at each station.

**The Corrosion Roundtable Forum** will be conducted Tuesday evening, February 27, from 4-5:30 p.m. This is an excellent opportunity to compare corrosion practices.

## Short-Course Registration Fee

The general registration fee is \$150 or \$175 for rectifier section per person through January 31, 2018. After that, a late fee of \$25 will be added. The luncheon on Wednesday is included with registration.

## Professional Development Hours (PDH)

PDH are available for the sessions identified as such. PDH are a standardized, nationwide method of recognition for participation in approved, non-credit educational activities. Attendance at the entire session (Basic, Intermediate, Advanced, or Practical Application) is required for credit. Recordkeeping for your PDH requirements is your responsibility.

## Program and Registration Information

*For registration information, please contact:*

**Amanda Johnson**, Conference Coordinator, or a **Registration Assistant** at (866) 515-0023 or [confreg@purdue.edu](mailto:confreg@purdue.edu)  
**[www.conf.purdue.edu/corrosion](http://www.conf.purdue.edu/corrosion)**

*For course content information, please contact:*

**Brad Malcolm**, General Chairman  
(260) 241-6898 or [bmalcolm@nisource.com](mailto:bmalcolm@nisource.com)

Once you are registered, you will receive an electronic confirmation letter with parking information, links to maps, and other information.

## Parking

Parking is available in the Grant Street Parking Garage, which is across the street (east) from the Purdue Memorial Union. The daily fee is \$10, with hourly rates for lesser time. Parking is free to Union Club Hotel guests. Please have your garage ticket validated at the Union Club desk prior to leaving the garage.

## Refunds

Refunds will be granted upon written request received by February 5, 2018. Purdue University is not responsible for costs incurred due to cancellation.

## Vendor Show

The Four Points by Sheraton (1600 Cumberland Avenue, West Lafayette) will be the location for the Supplier Hospitality and Information Show. The show will be held Tuesday (5:30-8:30pm) and Wednesday (6:00-9:00pm). Join a number of industry experts in a casual atmosphere to obtain the latest information on CP services and products. Food and beverages will be provided by the exhibitors. For your convenience, a shuttle bus between the Purdue Memorial Union and the Four Points by Sheraton will be provided, starting at 5:50 pm. The last bus will run at 9:30 p.m. (Four Points by Sheraton to Purdue campus). For more information, contact John Williams at [jpwilliams012@gmail.com](mailto:jpwilliams012@gmail.com) or (586) 747-5437.



## Preferred Lodging

A limited number of rooms will be available at both the Union Club Hotel in the Purdue Memorial Union, adjacent to Stewart Center, and Four Points by Sheraton (host hotel), where the Vendor Show will be held. (A shuttle bus will be available to take participants to Purdue; please check at the hotel desk for information).

Please mention this conference when registering at the Four Points by Sheraton. There has been a block of rooms reserved for Purdue Corrosion Short Course participants. You are urged to make housing reservations early.

## Preferred Lodging

Union Club Hotel, Purdue Memorial Union.....	765-494-8900 or 800-320-6291
Four Points by Sheraton, US 52 and Cumberland.....	765-463-5511

## Alternate Lodging

Comfort Inn, 4701 Meijer Court.....	765-447-3434
Comfort Suites Hotel, 31 Frontage Road.....	765-447-0016
Days Inn, I-65 and State Road 26 East .....	765-446-8558
Fairfield Inn, State Road 26 East.....	765-449-0083
Hampton Inn, I-65 and State Road 26 East.....	765-447-1600
Hilton Garden Inn, Tapawingo Dr. and State Road 26 .....	765-742-2100
Holiday Inn, 515 South Street .....	765-423-1000
Homewood Suites, 3939 State Rd 26 East .....	765-448-9700
Quality Inn, 4221 State Road 26 East.....	765-447-3434
Towne Place Suites, 163 Frontage Road .....	765-446-8668

# 57th Annual Underground Corrosion Short Course Schedule

*All times are Eastern Standard Time • All sessions in Stewart Center*

## Tuesday, February 27

- 11:00 am – 4:00 pm**    **Registration | Stewart Center in the East Foyer on the Main Floor**  
Check-in registration and receive materials and more information about the courses
- 11:00 am – 4:00 pm**    **NACE Corrosion Technician Review Course & Exam Proctoring | Stewart Center in the East Foyer on the Main Floor**  
A separate registration fee of \$99 will be charged to take the review course. This can be paid online at [www.conf.purdue.edu/corrosion](http://www.conf.purdue.edu/corrosion) or in person at registration. An Exam fee of \$100 will need to be sent to NACE with your exam. A \$200 application fee will need to be paid to NACE, to receive the certification (the application fee will not need to be paid until test results are received, which is an advantage to taking the exam at Purdue).
- 12:00 – 3:00 pm**    **Hands-On | Stewart Center**  
This will be an open forum with multiple stations. Several knowledgeable industry professionals will be available to demonstrate, answer questions, and help students use equipment at each station. The following stations will be available:
- Galvanic anode display
  - Rectifier
  - Impressed current anode display
  - Ultrasonic measurement testing
  - Coating thickness profile
  - Taking pipe-to-soil potentials
  - Current interrupter installation
  - Bond test station
  - Pit depth measurements
  - Locating
- 4:00 – 5:30 pm**    **Roundtable | Stewart Center**  
Roundtable discussion. This is an open forum for students with any corrosion related question.
- 6:30 – 9:30 pm**    **Vendor Show | Four Points by Sheraton**  
Shuttle bus will board at the Grant St. entrance of the Purdue Memorial Union (east side) starting at 5:50 p.m. on a rotating basis. Last bus returning to PMU will board at 9:30 p.m.

# Wednesday, February 28, 2018

Registration begins at 7:00 a.m. in Stewart Center in the East Foyer, Main Floor | General Session is from 8:00-9:00 a.m. in Fowler Hall (located next to the registration window in Stewart Center)

	Period 1 9:15 – 10:30	Period 2 10:45 – 11:45	Lunch 12:00 – 1:00	Period 3 1:15 – 2:30	Period 4 2:45 – 4:00	Period 5 4:15 – 5:30
<b>Basic Section</b> Brent Shuler, Chair	<i>Principals of Basic Electricity</i> Dan Ruane, Farwest Corrosion	<i>Corrosion Fundamentals</i> Brent Shuler, Columbia Gas of Ohio	PMU Ballroom	<i>Corrosion Control</i> Brent Shuler, Columbia Gas of Ohio	<i>Fundamentals of Cathodic Protection (Part 1)</i> Josh Brewer, Integrity Solutions	<i>Fundamentals of Cathodic Protection (Part 2)</i> Josh Brewer, Integrity Field Solutions; Brent Shuler, Columbia Gas of Ohio
<b>Intermediate Section</b> Tim Jenkins, Chair	<i>Rectifiers/Solar Panels, Part 1</i> Tim Jenkins, Dynamic Risk	<i>Rectifiers/Solar Panels, Part 2</i> Tim Jenkins, Dynamic Risk	PMU Ballroom	<i>Galvanic Anode Systems</i> Eric Langelund, Piping & Corrosion Specialist	<i>Impressed Current Anode Systems</i> Eric Langelund, Piping & Corrosion Specialist	<i>Interference Testing DC Part 1</i> Tim Jenkins, Dynamic Risk
<b>Advanced Section</b> Rogelio de las Casas, Chair	<i>Impressed Current CP Design, Part 1</i> Keith Boswell, NPS	<i>Impressed Current CP Design, Part 2</i> Keith Boswell, NPS	PMU Ballroom	<i>Cathodic Protection Installation</i> Nathan Wood, BGL	<i>Deep Anode Cathodic Protection Design</i> Nathan Wood, BGL	<i>Soil Resistivity Testing for CP Design</i> Lukas Szpak, Vectren
<b>Practical Applications of Corrosion Control</b> Mark James, Chair	<i>Introduction to Corrosion Control</i> Phil Eggen, EN Engineering	<i>Coatings</i> Doug Klingensmith, Unconventional Solutions	PMU Ballroom	<i>Coating Hands-On</i> Doug Klingensmith, Unconventional Solutions	<i>Cathodic Protection</i> Greg Alexander, Southern Company Gas	<i>Cathodic Protection</i> Greg Alexander, Southern Company Gas
<b>Rectifier School</b> Matt Hoekstra, Chair	<i>Rectifier School</i> Don Olson, IRT		PMU Ballroom		<i>Rectifier School</i> Don Olson, IRT	
<b>Pipeline Coatings</b> Frank Rampton, Chair	<i>Successful Field Coating Application</i> S.L. Feuquay	<i>Coating Inspections - Lessons Learned</i> Neil Pittman, Lake Superior Consulting	PMU Ballroom	<i>Coating Inspection Techniques</i> Tiffany Vorhies	<i>Coating Inspection Equipment/Calibrations</i> Chris Beninati, Elcometer	<i>Hands On, rotating stations: Coating &amp; inspection equipment</i> N. Pittman, T. Vorhies, C. Beninati, F. Rampton
<b>Special Topics</b> Jim Dooley, Chair	<i>Remote Monitoring</i> Steve Glover, Vectren	<i>AC Mitigation</i> Kurt Lawson, Mears	PMU Ballroom	<i>UT Probes/Coupons</i> Rob Leary, BSI	<i>HDD Coatings</i> Tammy Bomia, Neptune Research	<i>Casing Testing</i> John DeWess, WaveTrue
<b>Pipeline Integrity</b> Mike Mertes, Chair	<i>ACVG or DCVG, Does it Matter?</i> Jim Warner, Mears Group, Inc.	<i>ILI</i> Jeff Harris, Rosen	PMU Ballroom	<i>Operator Performance Specifications for ILI</i> Joseph Craycraft, NiSource	<i>Pressure Testing</i> Larry Decker, RCP	<i>Using GIS to Support Regulatory Requirements</i> Clarke Wiley & Chris O'Dell, SSP, NiSource
<b>Internal Corrosion</b> Jane Brown, Chair	<i>Internal Corrosion - An Operator's Perspective</i> Joe Galbraith, Phillips 66	<i>Internal Corrosion Materials</i> Dr. Guarav Agrade, University of North Texas Materials Dept.	PMU Ballroom	<i>Internal Corrosion &amp; Mitigation Programs</i> David Wint, Nalco Champion	<i>IC Risk Assessment</i> Lynsey Bensen, DNV	<i>Failure Analysis</i> Dr. Carlos Corleto, Knighthawk Labs

# Thursday, March 1, 2018

**Period 6**  
8:00 – 9:15

**Period 7**  
9:30 – 10:45

**Break**  
10:45 – 11:15

**Period 8**  
11:15 – 12:15

**Period 9**  
12:30 – 1:30

**Basic Section**  
Brent Shuler, Chair

*Cathodic Protection Measurement Basics (Part 1)*  
Luke Harris, Integrity Solutions

**Intermediate Section**  
Tim Jenkins, Chair

*Interference Testing DC Part 2*  
Mike Placzek, Ark Engineering

**Advanced Section**  
Rogelio de las Casas, Chair

*Galvanic Anode CP Design, Part 1*  
Rogelio de las Casas, DLCCP

**Practical Applications of Corrosion Control**  
Mark James, Chair

*Electrical Isolation*  
Mark Anderson, Mercer Technical Services

**Rectifier School**  
Matt Hoekstra, Chair

*Rectifier School*  
Don Olson, IRT

**Pipeline Coatings**  
Frank Rampton, Chair

*Atmospheric inspection of bridge piping and why coating specifications matter*  
Tim Bechtel, BGL

*(1) Pipeline Coatings & 192/195*  
Chuck Weindorf, IURC;  
Bill Lowry, PHMSA

*(2) Pipeline Coating Failures & Roundtable*  
Chuck Weindorf, IURC; J. Utley, Denso

**Special Topics**  
Jim Dooley, Chair

*Vapor Corrosion Inhibitor*  
Kelly Baker, ZeRust

**Pipeline Integrity**  
Mike Mertes, Chair

*Materials Validation / AIST*  
John Cline, Vectren Energy Delivery

*Defect Evaluation*  
Dr. Thomas Bubenik, DNV-GI

**Internal Corrosion**  
Jane Brown, Chair

*IC and Risk Assessment*  
Joe Galbraith, Phillips 66

*Monitoring Cathodic Protection*  
Steve Glover, Vectren

*AC Interference Part 2*  
Mike Baxter, TRC

*Impressed Current CP Design Exercise*  
Keith Boswell, NPS

*Rectifier Inspections & Resistivity Measurements*  
Steve Padden, Corpro Companies

*Rectifier School*  
Don Olson, IRT

*FBE, Liquid Epoxies & Patch Sticks on Pipelines*  
Steve Hall, 3M

*Millennials-How do we operate?*  
Angela Baylis, Southern Cross & Jen Holmstadt, WSB Assoc

*ILI*  
Lloyd Pirtle, TDW

*MIC Testing & What does it Mean?*  
Ronnie Wile, Dixie Testing

Snacks & Drinks

Snacks & Drinks

Snacks & Drinks

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Snacks & Drinks

VOLUNTARY EXAM

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PHMSA Roundtable

PHMSA Roundtable

PHMSA Roundtable

PHMSA Roundtable

## **Fitzgerald Award**

The Fitzgerald Award is the highest honor a Purdue Underground Corrosion Short Course student can receive. It has been awarded to a deserving student since 2004. This award is not given out every year, as some years no student is able to meet the criteria.

John Fitzgerald III, the award's namesake is a 1955 graduate of Yale University, professional engineer, a NACE Corrosion Specialist, and has been involved with corrosion work since 1959. He is a NACE International Fellow and has authored over 75 technical papers. John served as NACE International president from 1990 to 1991. He continues to be active in several short courses...including this one. You may see him instructing one of your classes this year.

## **Pierce Award**

The Pierce Award is an honor presented to a committee member or an individual that contributes to and adds value to the Purdue Underground Corrosion Short Course. 2013 was its inaugural year.

Jay Pierce began with the Purdue Underground Corrosion Short Course in 1980. He chaired the Power and Communications Section from 1985 and served 7 years as General Chairman. Jay is retired from the University but continues to assist the course committee as an advisor.

# **57th Annual Purdue Underground Corrosion Short Course Planning Committee and Sponsors**

### ***Hands-on Section***

Luke Harris, Integrity Solutions Field Services

### ***Basic Section***

Brent Shuler, Columbia Gas of Ohio

### ***Intermediate Section***

Tim Jenkins, Dynamic Risk

### ***Advanced Section***

Rogelio de las Casas, DeLasCasas CP

### ***Practical Application***

Mark James, Corpro

### ***Rectifier Section***

Matt Hoekstra, Buckeye Pipeline

### ***Coatings School***

Frank Rampton, Trenton

### ***Internal Corrosion***

Jerry Brown, Brown Corrosion

### ***Special Topics***

Jim Dooley, Farwest Corrosion

### ***Pipeline Integrity Section***

Mike Mertes, NISOURCE

### ***Testing***

Brent Shuler, Columbia Gas of Ohio

### ***Vendor Representative***

John Williams

### ***Historian***

Bill Fields, Ohio Valley Gas Corporation

### ***General Chairman***

Brad Malcolm, NIPSCO

### ***Vice Chairman***

Ray Bingman, Vectren Energy

### ***Veterans Program***

James Morrow, Integrity Solutions Field Services

### ***Advisers***

Josh Brewer, Integrity Solutions

Jeff Brown, Buckeye Pipeline

Mike Mertes, NISOURCE

Jay Pierce

Jim Utley, Denso North America

Ned Gisel, (ANR) TransCanada Pipeline

Bill Fields, Ohio Valley Gas Corporation

Phil Swinhart, Swinhart Corrosion Control

Jim Shank, Miller Pipeline

### ***Associations***

Chicago Regional Committee on Underground Corrosion

Indiana Corrosion Society

Michigan Electrolysis Committee

NACE International – Southwest Ohio Section

NACE International – Detroit Chapter

Ohio Corrosion Committee

Purdue Physical Facilities Utilities Department

### ***Sponsors***

Integrity Solutions

NIPSCO

Vectren

Columbia Gas of Ohio

***NOTE: Purdue University, Underground Corrosion Short Course, the planning committee, and the committee officers are not responsible for statements made by the speakers.***

# Underground Corrosion Short Course

February 28 – March 1, 2018

Name \_\_\_\_\_

Title \_\_\_\_\_

Organization \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_

\_\_\_\_\_ I plan on attending the Wednesday Luncheon (included in your registration). Please respond for planning purposes.

\_\_\_\_\_ I have special dietary needs: \_\_\_\_\_

\_\_\_\_\_ Please select the section you plan to attend from the list below.

- |                 |  |                       |
|-----------------|--|-----------------------|
| 1. Basic        | 4. Rectifier                           | 7. Pipeline Coatings  |
| 2. Intermediate | 5. Internal Corrosion Course           | 8. Special Topics     |
| 3. Advanced     | 6. Practical Applications of Corrosion | 9. Pipeline Integrity |

Purdue is committed to making its programs accessible to individuals with disabilities. If you require an accommodation or special assistance for this program due to a disability, please contact us at (866) 515-0023.

## Payment Method *Purdue University is not responsible for costs due to cancellation.*

General Registration by January 31: \$150

General Registration after January 31: \$175

Rectifier Registration by January 31: \$175

Rectifier Registration after January 31: \$200

NACE Corrosion Technician Review: \$99

Enclosed is a check made payable to Purdue University

Online registration available at [www.conf.purdue.edu/corrosion](http://www.conf.purdue.edu/corrosion). Credit card payment is required.

**Do NOT send credit card information through the United States Postal Service or via fax. Credit card payments can only be processed through online registration or a phone call to a Registration Assistant at (866) 515-0023.**

Please return this form to:

Conferences Business Services  
Purdue University  
Stewart Center, Room 110  
128 Memorial Mall  
West Lafayette, IN 47907-2034  
Fax: (765) 494-0567

57th Annual  
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