

News about corrosion and the corrosion industry produced quarterly for members of NACE International in the Calgary area

Don't Miss NACE MRO175/ISO 15156!

This is a very popular topic and session. NACE Calgary Section is therefore pleased to be able to bring Dr. Chris Fowler to Calgary to present this seminar in February. If you wish to attend, register early as it is sure to fill up quickly.

Why you should attend

You will receive first hand information and answers on:

- Selecting materials that comply with the MR0175/ISO 15156 Standard
- Avoiding costly failures due to corrosion of equipment and components
- Minimizing the health and safety risk to the public, personnel, and the environment due to corrosion induced failures
- Properly implementing MR0175/ ISO15156 specified materials
- Finding the latest changes made to the standard by the NACE/ISO Maintenance Panel
- Properly choosing metallic components to resist erosion corrosion and other corrosion mechanisms caused by CO₂ + H₂O
- Protecting metallic components from sulfide stress cracking, stress corrosion cracking, and other mechanisms of cracking caused by H₂S

The Presenter

Dr. Christopher Mark Fowler

President NACE International 2010/11

- Chairman NACE Europe 1998 – 2003 and 2007 – 2008
- International Director NACE 2003 – 2007
- ISO 15156 / MRO175 Maintenance Panel and Panel of expert's member
- Chairman EFC 17 Committee
- Director of Corrosion for Exova Group, a global provider of laboratory testing, advising and assuring services to many of the world's most innovative companies.

[Click here for more information and/or to register.](#)

Of Courses...

2011 NACE International Courses in Calgary

- ▶ **CIP Level 2:** Jan. 30-Feb. 4

[Click here](#) for information.

2011 (Tentative)

- ▶ **Coatings in Conjunction with Cathodic Protection:** May 2-6
- ▶ **ICP Advanced:** May 2-6
- ▶ **Basic Corrosion:** October 24-28
- ▶ **Basic Corrosion:** Oct. 31-Nov. 4
- ▶ **ICP-Basic:** Oct. 31-Nov. 4

More information?

[Click here](#) to contact Prabhu Srinivasan

Message from the Chair - Thane Schaffer



To all fellow NACE members:

In my first message as NACE Calgary Chair, I would like to thank you for the opportunity to serve in support of our common goal of corrosion knowledge and control. I would also like to thank the NACE Calgary Executive

Committee who do all the work. They are the tireless volunteers that are the force behind all the functions, trainings and technology we all have come to expect from the NACE organization. Their efforts and your participation have made NACE Calgary one of the most active and successful NACE Sections worldwide. I am honored to be part of such a great organization.

Over the past two years, with the direction of Past-Chair Doug Kellow, NACE Calgary has either implemented or expanded on strategies which have made our deliverables more effective for our members. Some of these strategies are:

- A more functional online registration tool
- A focused commitment on recognizing volunteers and their employers
- Expanded delivery of programs outside of Calgary
- Strong commitment to evaluating and acting on member feedback
- Implementation of industry specific tradeshow to enhance networking opportunities for our members.

Going forward, we will continue to support these successful initiatives and will endeavor to address a common request from our membership - "Expand the technical delivery of NACE Calgary to address the regional issues of the members". We have started to act on this message and are working on the following:

- Direct support of a corrosion related course to be offered through U of C
- Support for the growing OSHOW initiative
- Addition of half-day technical sessions in Calgary
- Addition of regional NACE papers to the NACE Calgary Website

Please watch future newsletters for updates on these and other initiatives to support you better.

Thane D. Schaffer

2010-1011 NACE Calgary Executive

Thane Schaffer, Chair Multi-Chem
Neil Park, Vice Chair Husky Energy
Doug Kellow, Area Trustee Weatherford
Bob Lotwin, Treasurer Pipetech Corporation
Matt Stroh, Program Chair Cimarron
Craig Ball, Program Pipetech Corporation
Irina Ward, Program Shell Canada
Neil Hay, Program Pennwest
Dave Grzyb, Program ERCB
Sherif Maksoud, Program Champion Technologies
Cat Taylor, Program Pengrowth
Prabhu Srinivasan Career Development Chair Vermilion Energy
Steve Love Career Development Kinder Morgan
Mike Westlund Arrangements Chair General Electric
James North, Arrangements Miswaco
Jana Haggins, Membership Talisman Energy
Thaier Al Issa, Technical Organizations Liaison
Sam Cauchi, Registration Fox-Tek
Beth Daniel, Archives Encana
E. Wayne Sudds, Ombudsman Baker Hughes
Janet Willson Administration/Communication in.sight communication
Evan Bloomfield, Section Advisor Vermilion Energy

Looking for a job? Want to find an Event? Interested in technical papers?

The NACE Calgary website has a lot of information and tools for members. These include:

- A listing of upcoming NACE Calgary and NACE International Courses taking place in Calgary, with links to registration
- Upcoming events for NACE Calgary, like the annual dinner and golf tournament, but also upcoming technical events of interest in Calgary, and NACE International Conferences.
- Career corrosion postings for Calgary
- An online form for changing your contact information
- A google calendar that highlights upcoming events.
- Links to technical papers from regional conferences and sessions
- Back issues of NACE Calgary quarterly newsletter
- Links to websites of interest

And there's more to come...

The NACE Executive has decided to do some things to refresh the site based on suggestions made in the bi-annual local member survey done last fall. If you missed filling out the survey but have ideas you would like to provide to help make the website more useful for members, now is the time to provide them. [Click here](#) to contact Janet Willson with your thoughts and ideas!

NACE
CALGARY SECTION

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Careers

HOME

HOME

Corrosion is...*The deterioration of a material, usually a metal, that results from a reaction with its environment.*

The goal of NACE Calgary is to protect people, assets and the environment in Western Canada from the affects of corrosion. We do this primarily through seminars, training and networking opportunities for people who are involved in corrosion prevention and control.

NACE Calgary has nearly 600 members in southern Alberta. We are one of the Northern Area sections of NACE International, a professional technical association dedicated to promoting public safety, protecting the environment, and reducing the economic impact of corrosion. With more than 25,000 members worldwide, NACE International is the largest organization in the world committed to the study of corrosion.

Register now for MRO175 seminar!

NACE Calgary Elemental Sulfur Mini Symposium Papers

Click here to learn about upcoming courses...

www.nacecalgary.ca

Teacher Camp Stimulates Corrosion, Materials and Welding Education

The ASM/NACE Materials Camp for Teachers will again be offered this year.

The camp is a workshop offered over several days that combines innovative classroom instruction and laboratory experiences. The sponsored workshops are designed to help teachers to:

- Engage their students with hands-on science experiences
- Help students explore material science in everyday life
- Introduce new ideas and technologies to excite student interest
- Encourage students to pursue education in corrosion sciences and engineering

NACE Calgary has been involved in teacher camps and workshops for many years. For the past few years, NACE Calgary and ASM Calgary have sponsored a one day mini Materials Teachers Camp at the Calgary Teachers Convention in place of the more in depth camp.

This year's camp is tentatively scheduled for four days in June. NACE and ASM will share the costs and the camp will be offered at SAIT. The planning committee is looking for industry volunteers. To learn more please [click here](#) to contact Jana Haggins.

NACE Intl. and ASM Intl. Launch Corrosion Analysis Website

NACE International, The Corrosion Society, has collaborated with ASM International, The Materials Information Society, to launch a new web site designed to provide a resource for solutions for corrosion problems related to control, prediction, and prevention.

The site is available on a subscription basis, but whether or not you subscribe, the site provides a considerable resource with non-subscriber access to:

- a complete library of published papers and articles from both societies
- corrosion videos
- corrosion images
- a dictionary of technical terms
- technical papers and articles on a variety of corrosion-related topics

Other technical societies are expected to join the network in the future, further expanding the collaborative opportunity for members of all organizations involved. [Click here](#) to visit the website.

Upcoming Events

NACE Calgary Annual Dinner

- ▶ June 3, 2010
- ▶ Calgary Chamber of Commerce

Annual Golf Tournament

- ▶ August 19, 2011
- ▶ Elbow Valley

Mark your calendars now. More details on both events later.

Conferences & Workshops

- ▶ [NACE Northern Area Western Conference](#), Feb.6-8,2011,Regina
- ▶ [CORROSION 2011](#) - March 13-17, Houston
- ▶ [Banff Pipeline Workshop](#) - April 3-7, Banff
- ▶ [ATI CSC11 Corrosion Solutions](#), Sept 25-30, 2011, Lake Louise
- ▶ [ACPA Scaling Chemistry Short Course](#), March 8 - 9, 2011, Calgary

Visit the [CATS Alberta](#) website for other technical events

For Your Information...

Featuring some of the worst corrosion related failures recorded around the world, along with historical references and lessons learned.

Assembled by Thayer Al-Issa, M.Eng. P.Eng

While this column typically features corrosion related cases, the following is included because it was a recent catastrophic event for which we already have historical references and lessons learned...

This edition of **FOR YOUR INFORMATION** features the worst environmental catastrophe in US history, the **Deepwater Horizon Oil Spill** in the **Gulf of Mexico**. This case is not related to any corrosion causes, yet it can be considered "the largest accidental marine oil spill in the history of the petroleum industry." (http://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill 12/23/2010)

Case 4: Gulf of Mexico Deepwater Horizon Spill

Incident failure summary:



The oil slick as seen from space by NASA's Terra satellite on May 24, 2010.



Deepwater Horizon drilling rig.



Vessels combat the fire on the Deepwater Horizon while the United States Coast Guard searches for missing crew.

Location	Gulf of Mexico near Mississippi River Delta, United States
Date	Spill date: 20 April – 15 July 2010 Well officially sealed: 19 September 2010
Cause	Wellhead blowout
Casualties	13 dead (11 killed on Deepwater Horizon, 2 additional oil-related deaths) 17 injured
Operator	Transocean under contract for BP
Spill characteristics	
Volume	up to 4,900,000 barrels (206,000,000 US gallons; 779,000 cubic meters)
Area	2,500 to 68,000 sq mi (6,500 to 180,000 km ²)

(http://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill 12/23/2010)

Critical Conditions & Root Cause

(<http://www.asascience.com/news/Deepwater/DeepWater-Horizon-Oil-Spill.pdf> 12/23/2010)

Draft - Work in progress. Not all information has been verified / corroborated. Subject to review in light of additional information or analysis

Macondo Well Diagram – Key Components & Critical Factors

Draft - Work in Progress. Subject to Revision

24 May, 2010

Critical Factors

1. Loss of Integrity of the 9 7/8" x 7" casing created a path for hydrocarbon (HC) influx
2. Unrecognized well conditions
 - Influx unrecognized - Integrity test failed to identify communication with the reservoir
 - Operations allowed HC influx to enter and move up the well bore – well became capable of flowing
 - Response failed to control the well
3. BOP & Emergency Systems failed to isolate the HC source
4. Gas plume ignited

Not All Information has been verified / corroborated. Subject to review in light of additional information or analysis

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Critical Factor 3 – BOP Failed to Isolate Source

Draft - Work in Progress. Subject to Revision

18 May 2010

BOP Failed to Isolate Source

Action to isolate the BOP once well condition was recognized failed to isolate the source

- BOP failed to secure the well (no seal activated from top after regulation)
- AWP Check-man failed to secure well
- Subsequent ROV interventions failed to secure the well

Ongoing work & forward plans

- Understand BOP testing history and performance of emergency systems, ESD, AWP shear, AWP (Deadline), ROV test
- Understanding of BOP configurations – could they have affected its functionality?
- Assess tests identified during ROV interventions and determine significance – could they have affected its functionality?
- Evaluation of BOP maintenance history, repairs system completeness, O&M and O&P services
- Inspect & test BOP components from sea floor

Not All Information has been verified / corroborated. Subject to review in light of additional information or analysis

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Case Background:

"The Deepwater Horizon was a 9-year-old semi-submersible mobile offshore drilling unit, a massive floating, dynamically positioned drilling rig that could operate in waters up to 8,000 feet (2,400 m) deep and drill down to 30,000 feet (9,100 m). It was owned by Transocean, operated under the Marshallese flag of convenience, and was under lease to BP from March 2008 to September 2013. At the time of the explosion, it was drilling an exploratory well at a water depth of approximately 5,000 feet (1,500 m) in the Macondo Prospect, located in the Mississippi Canyon Block 252 of the Gulf of Mexico in the United States exclusive economic zone about 41 miles (66 km) off the Louisiana coast.

Production casing was being installed and cemented by Halliburton Energy Services. At this point, Halliburton modeling systems were used several days running to design the cement slurry mix and ascertain what other supports were needed in the well bore.

BP is the operator and principal developer of the Macondo Prospect with a 65% share, while 25% is owned by Anadarko Petroleum Corporation, and 10% by MOEX Offshore 2007, a unit of Mitsui." (http://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill 12/23/2010)

Incident Synopsis:

"At approximately 9:45 p.m. CDT on April 20, 2010, methane gas from the well, under high pressure, shot all the way up and out of the drill column, expanded onto the platform, and then ignited and exploded. Fire then engulfed the platform. Efforts by multiple ships to douse the flames were unsuccessful. After burning for approximately 36 hours, the Deepwater Horizon sank on the morning of April 22, 2010.

The first attempts to stop the oil spill were to use remotely operated underwater vehicles to close the blowout preventer valves on the well head; however, all these attempts failed. The second technique, placing a 125-tonne (280,000 lb) containment dome (which had worked on leaks in shallower water) over the largest leak and piping the oil to a storage vessel on the surface, failed when gas leaking from the pipe combined with cold water formed methane hydrate crystals that blocked the opening at the top of the dome. More successful was the process of positioning a riser insertion tube into the wide burst pipe. There was a stopper-like washer around the tube that plugs the end of the riser and diverts the flow into the insertion tube. The collected gas was flared and oil stored on the board of drillship Discoverer Enterprise. 924,000 US gallons (22,000 barrels) of oil were collected before removal of the tube. By June 3, BP removed the damaged riser from the top of the blowout preventer and covered the pipe by the cap which connected it to a riser.

On June 16, a second containment system connected directly to the blowout preventer became operational carrying oil and gas to the Q4000 service vessel where it was burned in a clean-burning system. On July 10, the containment cap was removed to replace it with a better-fitting cap consisting of a Flange Transition Spool and a 3 Ram Stack ("Top Hat Number 10"). On July 15 BP tested the well integrity by shutting off pipes that were funneling some of the oil to ships on the surface, so the full force of the gusher from the wellhead went up into the cap.

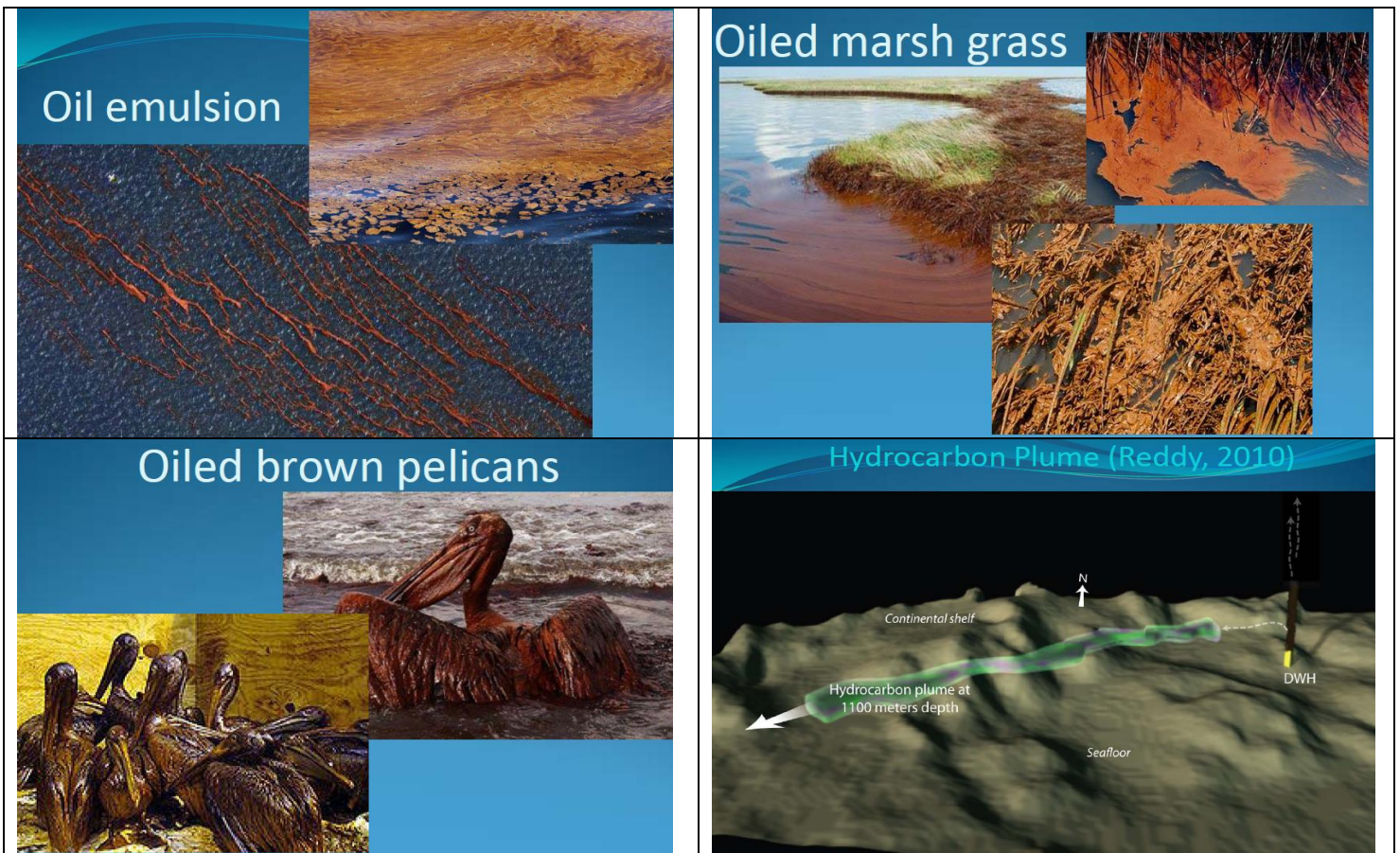
Transocean's Development Driller III started drilling a first relief well on May 2 and was at 13,978 feet (4,260 m) out of 18,000 feet (5,500 m) as of June 14. Starting at 15:00 CDT on August 3, first test oil and then drilling mud was pumped at a slow rate of approximately two barrels/minute into the well-head. Pumping continued for eight hours, at the end of which time the

well was declared to be "in a static condition." On September 19, 2010, BP effectively killed the Macondo Well five months after the April 20th explosion."
 (http://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill 12/23/2010)

Incident Environmental Consequences

"Based on National Oceanic and Atmospheric Administration (NOAA) estimates, up to 75 percent of the oil from BP's Gulf oil disaster still remains in the Gulf environment..."

The spill is the 'worst environmental disaster the US has faced', according to White House energy adviser Carol Browner. Factors such as petroleum toxicity, oxygen depletion and the use of Corexit dispersant are thought to be the main causes of damage. Eight U.S. national parks are threatened. More than 400 species that live in the Gulf islands and marshlands are at risk, including the endangered Kemp's Ridley turtle, the Green Turtle, the Loggerhead Turtle, the Hawksbill Turtle, and the Leatherback Turtle. In the national refuges most at risk, about 34,000 birds have been counted, including gulls, pelicans, roseate spoonbills, egrets, terns, and blue herons. A comprehensive 2009 inventory of offshore Gulf species counted 15,700. The area of the oil spill includes 8,332 species, including more than 1,200 fish, 200 birds, 1,400 mollusks, 1,500 crustaceans, 4 sea turtles, and 29 marine mammals." (http://en.wikipedia.org/wiki/Deepwater_Horizon_oil_spill, 12/23/2010)



(<http://www.asascience.com/news/Deepwater/DeepWater-Horizon-Oil-Spill.pdf> 12/23/2010)

What's Next

- "NRC - The National Research Council - study in progress, Presidential Commission, determines root cause of accident, recommend action.
- Congressional hearings and legislation to change offshore drilling operations and regulatory oversight.
- Industry led, \$1 B effort to develop spill response capability for deep water
- Formal environmental impact/damage assessment of spill (under water plume mapping)
- **Litigation, litigation, and more litigation**... joint and several liability, spread the responsibility (300 suits filed to date, \$20 B compensation fund)
- Some key issues: root cause of accident, amount of oil released, effectiveness and impact of dispersant use (underwater and aerially), spill response decision making, economic and societal impacts, loss of income from fishing and tourism, etc. "
(<http://www.asascience.com/news/Deepwater/DeepWater-Horizon-Oil-Spill.pdf> 12/23/2010)

Lessons Learned:

- SAFETY & SAFETY FIRST...Revise Off shore personnel safety & evacuation.
- Revise well drilling operations & related safety measurements
- Preparedness to respond & contain spills...Revise emergency response plans & get personnel well prepared.
- Other than the previous, lots was said & published on the net in regard that will take several pages to fill. We advise googling "Deepwater Horizon oil spill lessons learned" for more details.



NACE News is produced four times a year by the Executive Committee of NACE Calgary Section, in December, March, June and September.

To provide feedback or to submit an article or story idea, email: nacenews@nacecalgary.ca.