⚡EUCI
COURSE

DIGITAL OILFIELD 2.0: CONVERGENCE OF OT & IT

May 18-19, 2020
EUCI Conference Center
Plaza Tower One Conference Center
Denver, CO

TAG US #EUCI
FOLLOW US @EUCIEvents

AUTHORIZED IACET PROVIDER

EUCI is authorized by IACET to offer 1.0 CEUs for the course

OVERVIEW

Operations Technology (OT) and Information Technology (IT) have developed at a still increasing rate over the past several decades, each creating new ways of operating in its circle. Upstream field ope ations bring these two disciplines together in exciting and often challenging ways. If you work in either, it is critical that you learn how they work together so you can take full advantage of the benefits and n vigate challenges.

Operations Technology (aka: Instrumentation and Control)—which includes Process Control & Field Automation (SCADA & DCS), Smart Equipment (OEM) and Plant Automation and Asset Performance Management (APM)—has developed largely in a manufacturing/plant environment. Independently, corporate Information Technology has also developed in areas such as Data Center, Networks (WAN & LAN), Desktop, and Enterprise application platforms (Finance, HR, Supply Chain, Marketing). The digital oilfield has b ought these two disciplines together in potentially valuable but often challenging ways. The OT world is now operating on commercial technology platforms and making operational data available to the corporate networks (finan e, engineering). However, the two cultures are still learning to work together to address common issues of cybersecurity, mobile data access, and many others. IT and OT professionals will get an overview about how their job roles intersect. With this understanding, IT professionals will be better able to create applications that assist with the operations they are designed for in a more direct manner. OT professionals will be better able to use analytics and data gathering tools by gaining a more in depth understanding of how they work and what they can be used for.

This course will provide a comprehensive set of introductory information about the Digital Oilfiel , specifically ocusing on the convergence of technology, systems, practices, and required skills from the two key disciplines of operational technology and information technology for professionals working at oil and gas operators, oilfield se vice companies, and technology fi ms.

Key topics to be discussed in this course include:
- An overview of the Digital Oilfield and wh t is changing with DOF 2.0
- How to bring OT and IT on the same page; technology and culture
- Improving the HMI (human machine interface) for field ope ators and data access for optimization/reliability engineering
- The role of remote decision support centers
- How to achieve situational awareness and the change for route-based operations minimizing the number of visits to the well pad
- Cybersecurity concerns for field ope ations or how to hack an oilfiel
- Emerging architectures for field I&C (instrume tation and control)
  - o Mobile computing, edge and fog computing

LEARNING OUTCOMES

- Discuss what is meant by the digital oilfield and wh t is the current areas of interest by the O&G industry
- Identify the levels of the Digital Oilfield IT stac
- Review the history, practices, and challenges of traditional operational technology, field instrume tation and control, and the difference between onshore and offshore operations
- Review the history, practices, and challenges of traditional information technology; difference between corporate systems and business unit and function-specific ope ations
- Identify the touch points between OT and IT in the digital oilfiel
- Identify the vulnerabilities that open when OT and IT systems are connected for cyberattacks; what is the significan e of Stuxnet
- Discuss the role and opportunities of new remote decision support centers
- Discuss the concept of situational awareness and identify the dead spots in digital surveillance of legacy assets
- Discuss the pros and cons of new digital technology and emerging architecture patterns that could dramatically change the current field au omation paradigm
- Discuss the impact of automation, smart equipment and processes, advanced analytics, robotics, and drones on the future of oilfield ope ations

WHO SHOULD ATTEND

- Operations and maintenance supervisors from oil and gas producers
- I&C specialist involved in field au omation and remote decision support center operations
- Information technologists involved in support of oilfield ope ations (communications, data, and applications)
- System architects charged with developing systems that link field and orporate information architectures
- Service company managers and product managers who are responsible for products and services that support oilfiel operations
- Physical and cyber security specialists working on digital oilfield ope ations

WHAT PAST ATTENDEES HAVE SAID

"I really appreciated Jim and his personal style."

IT Business Analyst, Whiting

"Jim clearly brings a career's worth of oilfield insights. I feel smarter having spent two days in a room with him."

Halliburton

"Love James's knowledge of both OT/IT."

I&E Tech, Whiting Oil & Gas

"Lots of great stories from personal experience, relevant examples."

Sr. Business Analyst, Whiting

"I really enjoy the visuals and case studies [and] real life experiences."

Business Advisor, Whiting

AGENDA

MONDAY, MAY 18, 2020

8:00 – 8:30 am **Registration and Continental Breakfast**

8:30 – 9:00 am **Introduction**

9:00 – 10:00 am **Overview of the Digital Oilfield**
The concept of the Digital Oilfield sta ted about 20 years ago when increased field instrume tation, process control, and advanced software and data analysis techniques were brought to the operations and engineering practices in the oil fiel . The first gene ation of the digital oilfield solutions c eated value to complex drilling in offshore basins and optimization workfl ws to production challenges. The second generation of the digital oilfield is going fa ther with smart equipment, automation, and more statistical analysis and machine learning models.
- A brief history of the digital oilfield (DOF
- Lessons learned from the first decad
- The digital oilfield IT stac
- What is different this time around with DOF 2.0

10:00 – 11:00 am **The Current State of OT**
When most people think of Oilfield au omation systems, they usually think of SCADA (Supervisory Control and Data Acquisition) systems and downhole sensors. Oil and gas companies regularly collect critical data from remote well sites and production locations to monitor facilities, such as wellheads, storage tanks, artificial li t units, or pipelines. Current systems essentially polls information one-way back to central servers, where field pe formance data is displayed in an HMI (human machine interface) which trigger alarms or alerts that are used to dispatch personnel to visit the location to investigate.
- Sensors and field instrume tation
- Field communication networks
- Monitoring by "windshield miles" by lease operators
- SCADA and DCS

11:00 – 11:30 am **Networking Break**

11:30 am – 12:30 pm **The Current State of OT Versus IT**
According to Luigi De Bernardini, CEO, Autoware, in a recent blog in Automation World: "The convergence of information technology (IT) and operational technology (OT) is one of the key mantras in smart manufacturing (and the digital oilfield). This convergence has many different faces with several organizational and technical implications." The initial digital oilfield engageme t of OT and IT has surfaced a number of barriers but also points to significa t potential when near-real time data can be used to update predictive models allowing operators to go beyond static alarms and "run-to-failure" maintenance practices.
- Touchpoints between OT and IT
- A culture of electrical engineering versus programmers
- A different perspective on uptime and version control
- Historians and electronic data recorders

12:30 – 1:30 pm **Group Luncheon**

EUCI

AGENDA

1:30 – 2:30 pm **The Convergence of OT and IT**

Mr. Bernardini points out that there's still strong resistance to change at the organizational level between OT and IT. Most companies still have two strongly separated departments for operations and IT. They have different people, goals, policies, and projects. They not only operate in a very separate way, but sometimes they even have conflicting approaches. Continuing to operate separately not only slows the adoption of solutions based on technologies that fall outside of operations' comfort zone, but also exposes companies to security risks that could significantly impact production.

- OT moves to commercial platforms
- The limitations of HMI and historians
- Manage by exception (how alarm management is changing)
- Unified governance over OT and IT

2:30 – 3:30 pm **Managing a New Data Type**

Operational systems present a new data type to the engineering community. A time series is a series of data points indexed (or listed or graphed) in time order. Most commonly, a time series is a sequence taken at successive equally spaced points in time. Thus, it is a sequence of discrete-time data. Examples of time series for oil and gas operations includes measurement of pressure, temperature and sometimes flow rates. Incorporating time series into both physics-based and statistics-based predictive models and simulations help operators move from reactive to predictive practices.

- How to manage time series data
- Streaming analytics
- Adding context: manual inspections, work orders, periodic measurements
- Enriching relational data models with transactional data

3:30 – 4:00 pm **Networking Break**

4:00 – 5:00 pm **Cybersecurity**

System security from traditional operational systems was based on their proprietary technology and isolated networks. The digital oilfield connects the field to the office to the supply chain. The discovery of field data by engineering applications offers great promise but also brings its own set of cybersecurity challenges.

- Security through obscurity
- Situational awareness challenges
- The impact of Stuxnet
- Internal firewalls

AGENDA

TUESDAY, MAY 19, 2020

7:30 – 8:00 am   **Continental Breakfast**

8:00 – 8:30 am   **Review of Day One**

8:30 – 9:30 am   **Remote Decision Support Centers**
A decision support system (DSS) is an information system that supports organizational decision-making activities. DSSs serve the management, operations and planning levels of an organization and help people plan for or react to changes in field pe formance. One of the characteristics of the digital oilfield is the development of remote decision support centers helping to link field and office with the same view of performance data.
- A second pair of eyes
- Offshore drilling and production
- Onshore drilling and production
- Monitoring-as-a-service

9:30 - 10:30 am   **The Impact of Instrumentation and Automation on Field Operations**
According to a McKinsey article on "Digitization of Oil and Gas Production," "More complex operations, increasing volume and complexity in hostile, remote locations (for example, arctic, offshore, and deepwater) require reliable remote and automated or semiautomated operations, and logistics optimized for efficie   y." The promise of the digital oilfield is o significa tly improve the productivity of physical assets and the humans that work in these environments. Automation and data-driven workfl ws are at the heart of this new world.
- Smart equipment
- Use of drones and UAV for inspection
- Route management: How to avoid visiting the well site
- Safety: Removing people from harm's way

10:30 - 11:00 am   **Networking Break**

11:00 am - 12:00 pm   **The Impact of Digital Technology and Advanced Analytics**
According to that same McKinsey article, "The rapid progress of technology such as big data and analytics, sensors, and control systems offers oil and gas companies the chance to automate high-cost, dangerous, or error-prone tasks." Most oil and gas operators have announced some kind of digital oilfield or di ital transformation project either at corporate, functional or asset level. The objective is to turn the potential of all the data that is being collected into sustainable solutions improving field and equipment performance, holistic asset lifecycle value, and better results on the bottom line.
- Reactive, scheduled, predictive, and prescriptive maintenance of critical equipment
- The impact of emerging architecture patterns (Fog and Edge computing)
- Who owns the data
- Digital platforms

12:00 – 12:30 pm   **Summary and Questions**

12:30 pm   **Course Concludes**

INSTRUCTOR

Jim Crompton

Jim retired from Chevron in 2013 after almost 37 years with the oil major. After moving to Colorado Springs, CO, Jim established the Refle tions Data Consulting LLC to continue his work in the area of data management and analytics for the Oil & Gas industry.

Jim was a Distinguished Lecturer for the Society of Petroleum Engineers in 2010-2011, speaking on the topic of "Putting the Focus on Data", and he is a frequent speaker at SPE conferences on Digital/ Intelligent Energy. His interests lie in the full spectrum of the information value chain from data capture, data management, data visualization, data access, modeling and analytics, simulations, and serious gaming.

Jim graduated from the Colorado School of Mines (BS in Geophysical Engineering in 1974 and MS in Geophysics in 1976) before joining Chevron in Denver, CO. He later earned an MBA degree (1996) from Our Lady of the Lake University (San Antonio, TX).

In 1999, Jim was elected to the position of chair of the general committee of PIDX (Petroleum Industry Data Exchange), the API electronic commerce subcommittee. Jim was able to influen e the direction of the standards setting activities towards emerging technologies, such as XML, and new electronic business models in the energy industry.

In acknowledgement of his contributions in applications of information technology to business problems, Jim was named a Chevron Fellow in 2002. In 2013, Jim co-authored a book titled The Future Belongs to the Digital Engineer with Dr. Dutch Holland, which focuses on the issues of the impact of emerging digital technology on oil and gas operations. He is currently working on his second book with Steve Cooper of EnergyIQ.

In 2017, Jim was named as the PNEC Cornerstone award winner. Jim was selected to be on the board of the SPE Digital Energy Technology Section (DETS), is chair of the Digital Transformation committee under DETS, and is working on a subcommittee developing a digital academy curriculum for SPE. As of January 2018, Jim is an adjunct teaching faculty member in the Petroleum Engineering Department at the Colorado School of Mines teaching a graduate level course in "Petroleum Data Analytics".

INSTRUCTIONAL METHODS

PowerPoint presentations, group discussions, and active participation.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for a minimum of four hours to be eligible for any continuing education credit.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for this course

EVENT LOCATION

Plaza Tower One Conference Center
6400 S Fiddlers Green Cir. Greenwood Village, CO 80111
The EUCI conference center is conveniently located adjacent to the Arapahoe at Village Center Light Rail Station, allowing easy access to and from DIA, Downtown, and Local Area Attractions. EUCI will validate parking at the Plaza Tower One Conference Center.

NEARBY HOTELS

Each of these hotels offers a complimentary shuttle to and from the EUCI conference center.

Hyatt Regency Denver Tech (*2.8 miles away*)
7800 E. Tufts Ave. Denver, CO 80237
303-779-1234

Special EUCI Room Rate: $179.00 *or lowest available rate*
To access EUCI room rate visit
denvertechcenter.regency.hyatt.com
Click "Book Now", then click "Special Rates",
Click "Corporate or Group Code" and enter **CR102338**

You may also call central reservation at **1-800-233-1234** and give them the corporate code of **CR102338**

Springhill Suites DTC (*0.3 miles away*)
7900 East Peakview Ave., Greenwood Village, CO 80111
303-721-3321

Wingate by Wyndham (*0.3 miles away*)
8000 E. Peakview Ave., Greenwood Village, CO 80111
303-626-2641

Hyatt Place DTC (*2.1 miles away*
8300 E. Crescent Pkwy, Greenwood Village, CO 80111
303-804-7000

Denver Marriott Tech Center (*3.1 miles away*)
4900 S. Syracuse St., Denver, CO 80237
303-779-1100

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this conference may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

To Register Click Here, or

Mail Directly To:
PMA Conference Management
PO Box 2303
Falls Church VA 22042
201 871 0474
Fax 253 663 7224
register@pmaconference.com

EVENT LOCATION

Plaza Tower One Conference Center
6400 S Fiddlers Green Cir.
Greenwood Village, CO 80111

See nearby hotels on page 8

PLEASE SELECT

○ **DIGITAL OILFIELD 2.0: CONVERGENCE OF OT & IT COURSE**
MAY 18-19, 2020 : US $1395
EARLY BIRD on or before MAY 5, 2020: US $1195

ENERGIZE WEEKLY

Energize Weekly is EUCI's free weekly newsletter, delivered to your inbox every Wednesday. We provide you with the latest industry news as well as in-depth analysis from our own team of experts. Subscribers also receive free downloadable presentations from our past events.

○ Sign me up for Energize Weekly

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name   Job Title

Company

What name do you prefer on your name badge?

Address

City   State/Province   Zip/Postal Code   Country

Phone   Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card   Billing Address

Account Number   Billing City   Billing State

Exp. Date   Security Code (last 3 digits on the back of   Billing Zip Code/Postal Code
                 Visa and MC or 4 digits on front of AmEx)

OR Enclosed is a check for $ _____ to cover _____ registrations.

Substitutions & Cancellations
Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before January 24, 2020 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices.
EUCI reserves the right to alter this program without prior notice.