PetroSkills®

2013 FACILITIES TRAINING GUIDE

INSIDE THIS ISSUE: Technical Training Courses for Facilities Engineers in Upstream Oil and Gas Topics Include: Gas Processing, Process Facilities, Mechanical, E&IC, Process Safety Engineering, Offshore Facilities, Gas Gathering Systems, Relief & Flare, Utility Systems and more.

ADDITIONAL COURSES FOR:

- OPERATOR TRAINING - Production and processing operations, gas dehydration operations, cryogenic NGL recovery and NGL fractionation. (Courses Customized to Your Plant and Operations)
- SUPPLY CHAIN PROFESSIONALS IN UPSTREAM OIL AND GAS
- OPERATIONS AND MAINTENANCE PROFESSIONALS

NEW COURSES INCLUDE:

- FPM-62 Advanced Project Management, PAGE 39
- IC-71 PLC and SCADA Technologies, PAGE 33
- IC-72 Valves and Actuators, PAGE 33
- PS-2 Process Safety Overview – Non-Technical, PAGE 42
- REL-61 Risk-Based Inspection, PAGE 36

OGCI®

John M. Campbell & Co.

Letter From **The President**

As we enter 2013, John M. Campbell & Company continues to experience exceptional demand for our training programs and we thank all of our customers, worldwide, for their repeated support. We are very excited about our growing list of courses, developed and taught by experienced professionals who are proficient at sharing their know-how with the participants in a way that leads to relevant and applicable learning. Our course schedule can be found on pages 12-14. We suggest early enrollment in our public courses as they tend to fill quickly. In-house courses may be an option if you have over 12 participants. Also, please contact us about "sponsored public" courses that we can offer when several clients in one geographical area have common training needs.

Our focus continues to be on learning programs that produce competent facilities engineers in the shortest time possible and increase the depth and breadth of understanding for those professionals in related disciplines involved in the design and operation of oil and gas facilities. You will notice several examples of course progressions in our catalog (pages 16, 22, 28, and 30). These are designed to be a visual road map for selecting courses that provide essential knowledge and skills in many technical competencies.

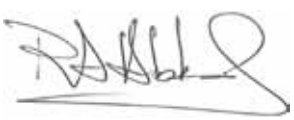
In 2013 we are adding several new courses to our curriculum:

1) FPM-62 Advanced Project Management - This new specialized course targets project managers, asset managers, and project engineers that are involved in the engineering, procurement and construction of surface facilities and pipelines for large onshore, offshore and pipeline projects. A detailed course description can be found on page 39.

2) REL-61 Risk Based Inspection - This new course is for anyone concerned with the safe on-going operation of pressure containing equipment in oil and gas facilities. The risk based approach requires a systematic and integrated use of expertise from the different disciplines that impact plant integrity. When properly implemented, this results in improved safety, lower failure risk, fewer forced shutdowns, and reduced operational costs. A detailed course description can be found on page 36.

3) PS-2 Process Safety Overview - Non-Technical - This new course provides an overview of process safety fundamentals for hydrocarbon processing facilities, with emphasis on the upstream oil and gas sector. The focus of this course is on how process safety is a key activity for all disciplines in the day-to-day activities of a facility. A detailed course description can be found on page 42.

As we enter 2013, our mission is to continue a long tradition of designing, developing and delivering world-class technical training programs. We've been doing so since 1968. Thank you for entrusting John M. Campbell & Company with the development of your people.



Robert A. Hubbard
President
John M. Campbell & Co.

DELIVERING TECHNICAL TRAINING TO OIL & GAS FACILITIES ENGINEERS

65,000+	**Engineers Trained on Gas Processing**
45+ YEARS	**Training Oil and Gas Engineers**
30+ YEARS	**Instructors Avg 30+ Years of Real-World Experience**

OUR VISION: Be the preeminent provider of technical training solutions to the international energy industry.

OUR MISSION: Partner with the energy industry to design, develop and deliver world-class technical training programs that produce measureable results and inspire customer loyalty by building competency in their workforce.

"John M. Campbell & Co., Norman, Oklahoma, one of the world's largest and best-known oil and gas training companies." — OIL AND GAS JOURNAL

John M. Campbell & Co., an employee-owned company, is the exclusive provider of PetroSkills facilities training and one of the most distinguished providers of training in the oil and gas industry. Since 1968 we have built our reputation on our "Gas Conditioning and Processing" course also known as "The Campbell Gas Course™" or the "Campbell G-4". As demand for highly skilled employees in the petroleum industry grows, we have expanded our training curriculum to include the whole stream of skills needed from well-head to the finished product.

LET US HELP YOU! Call 405-321-1383 or email jmcsupport@jmcampbell.com.

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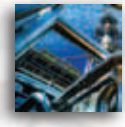
GAS PROCESSING



PROCESS FACILITIES

OFFSHORE

PIPELINE

INSTRUMENTATION, CONTROLS & ELECTRICAL

MECHANICAL

OPERATIONS MANAGEMENT

OPERATOR TRAINING

REFINING

PROCUREMENT/SUPPLY CHAIN

John M. Campbell & Co.

Exclusive provider of **PetroSkills** facilities training.

WHAT SETS PETROSKILLS APART? THE ALLIANCE.

THE PETROSKILLS ALLIANCE | Created in 2001 by BP, Shell, and OGCI to provide "important but not unique" high-quality, business-relevant, competency-based training. Through its membership PetroSkills has successfully evolved into an industry-driven, industry-approved program that spans the value chain. PetroSkills continues to grow as additional organizations join the PetroSkills Alliance at various levels.

MISSION.

Build competent petroleum professionals by delivering learning and development when, where and how customers need it.

OBJECTIVES:

- Provide the highest quality, business relevant program that spans all technical processes, and give management assurance that they have the skilled people they need to maximize asset value
- Offer added value to employees via courses that are new, broad, fill gaps, and deliver the ability to perform and be able to prove it
- Ensure the instructors are the best available
- Develop and continuously improve PetroSkills Competency Maps and progression trees; continue to align Competency Maps with corporate business goals
- Lower internal training costs by reducing administrative burdens, improving economies of scale, and/or eliminating marginal courses
- Increase the availability of courses in both the number of offerings and the number of delivery locations, thereby delivering competencies at the lowest total cost

Building a **Performance-Ready** Facilities Engineer

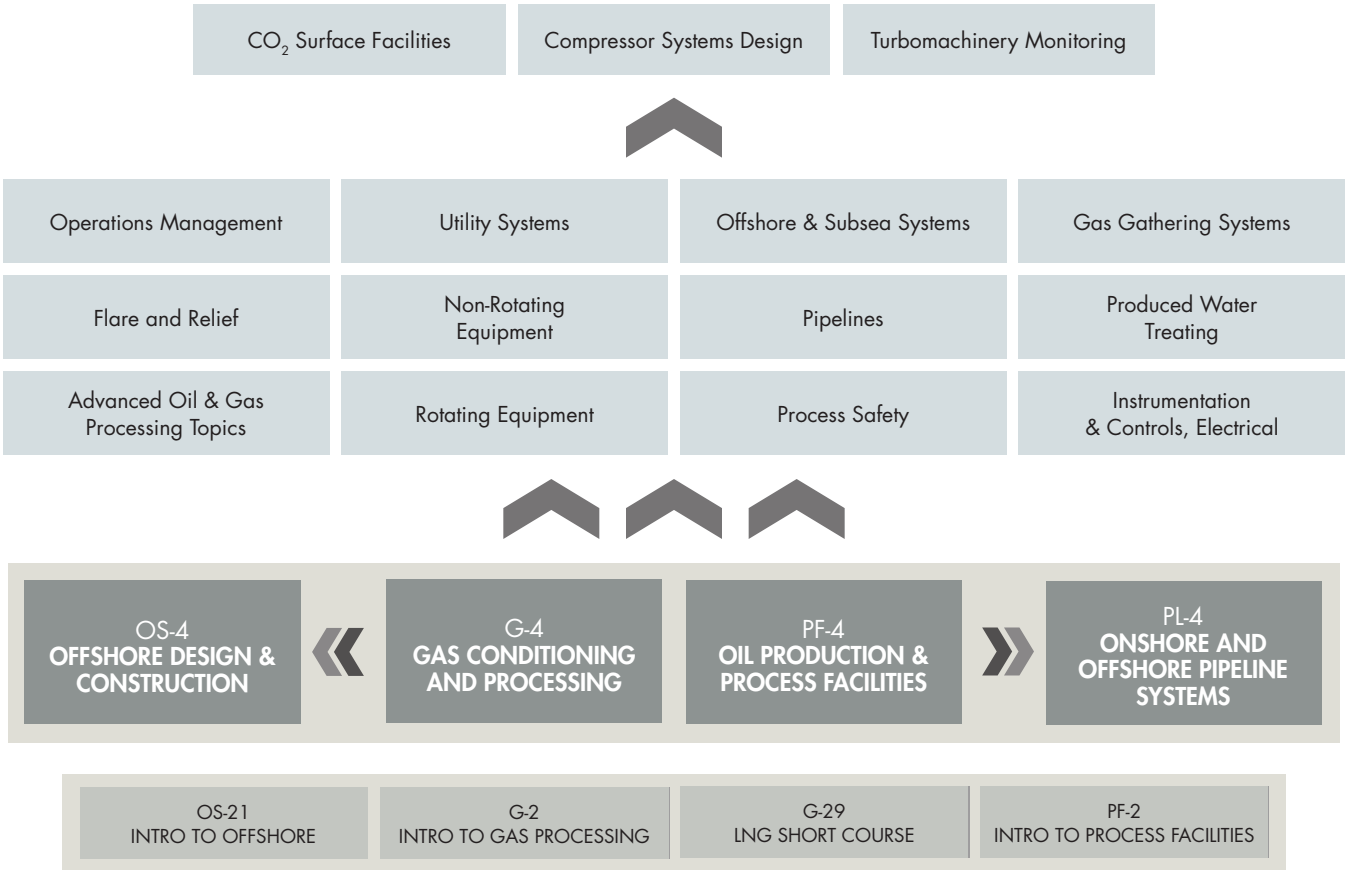
HOW TO QUICKLY BUILD A PERFORMANCE-READY SURFACE FACILITIES ENGINEER

A structured, integrated training program consisting of courses taken in a logical progression is the key to quickly developing a 'broad-based' facilities engineer who is ready to perform based on their technical knowledge and experience.

The diagram below illustrates this comprehensive approach where each course builds on a previous course. The bottom layer consists of basic courses for broad interest, or a refresher course or as a primer for a higher level course. The next layer up consists of our foundational level courses (e.g. OS-4, G-4, PF-4, and PL-4) that give a solid foundation for a career as a facilities engineer. After completing one or more foundation level courses, to broaden your knowledge on specific topics, an engineer is ready for our mid-level courses with a variety of topics whether it is in process safety, rotating equipment, or instrumentation and controls. If more in-depth specialization is required, additional specialized courses may be chosen.

While we believe in the value and efficiency of face-to-face training for technical knowledge transfer, younger engineers also need to be applying what they learn in our courses to their everyday jobs. With Campbell Designed Work Experience Inventories™, key learning points received in the classroom are reinforced in real-world situations, then verified and cataloged for assurance purposes.

Face-to-face training, work experience inventories, mentoring and coaching all work together to make up a robust Accelerated Development Program (ADP). For more information on a customized ADP for your company, contact us at today at 405-321-1383 or email us at info@jmcampbell.com.



Expanded versions of this diagram are available further in our catalog for Gas Processing Engineers, Process Facilities Engineers, Offshore Engineers, and Pipeline Engineers.

Providing your young facilities engineers the knowledge and skills they need to perform on the job is a high-priority for any company. Achieving it quickly and cost effectively is the challenge. Working with your technical management and human resource teams to help your facilities engineers succeed is what we do. Whether it's developing technical competency maps, customized work experiences or delivering knowledge transfer through e-learning, face-to-face training, mentoring or coaching, John M. Campbell & Co. has the experience and expertise to build performance-ready facilities engineers for your company. We've been doing it for over 40 years. **To find out more, call 405-321-1383 or send us an email at jmcsupport@jmcampbell.com.**

What Does This Young Facilities Engineer Need to Know?

Asset Location: Northern Caspian Sea area

Asset: $2 billion dollar gas field development, shallow water offshore & onshore facilities

Life-cycle stage: Option selection (Front End)

Environment: Severe climate conditions, environmentally sensitive region

Technical challenges: High pressure/high temperature (HP/HT) reservoir, 20% H2S, acid gas/sulfur disposition, limited gas and hydrocarbon liquid export options, minimal in-country fabrication/construction capability

Job location: London, UK - EPC contractor's office

Job experience: 13 months

John M. Campbell & Co.

Announcing the John M. Campbell & Company ■ **FREE Facilities Engineer Webinar Series**

Career Building Content:

Build Your Knowledge and Skills with Timely, Content-Rich Technical Topics Delivered Right To Your Desktop, Smartphone or iPad.

OUR NEW FACILITIES ENGINEER WEBINAR SERIES INCLUDES THE FOLLOWING EXPERTS AND TOPICS:

"How to Squeeze More Life From Your Molecular Sieve Dehydrator" with Mr. Harvey Malino

In this webinar, Mr. Harvey Malino will look at the application of molecular sieves to dehydrate natural gas (this webinar assumes the viewer will have a basic knowledge of adsorption). The discussion will also cover the transient nature of an adsoption process and common misperceptions about cycle time and pressure drops. Other topics include: simple approaches to extend the life of a molecular sieve bed while in the design phase and typical operating problems encountered in the field.

"A Key to Unlocking Pipeline Stress in Offshore Pipeline Construction" with Mr. David Hairston

During the installation of offshore pipelays, the steel pipe will see some of the highest stresses of its entire lifecycle. These stresses frequently reach 80 percent of the yield strength of the materials. One consequence of these high installation stresses is that construction considerations often set the wall thickness and the pipe grade (yield stress). In this webinar, Mr. David Hairston will develop the geometric framework that leads to defining the stresses in the pipe during installation.

"How to Deal with Performance Issues in Parallel & Series Pump Operations" with Mr. Stu Watson

In this webinar, Mr. Stu Watson will review applications and design philosophies where pumps may be installed in Parallel and Series. He will also recap the foundations of centrifugal pump curves and system curves. Other topics include: operating points on the pump curve, arranging pumps in both parallel and series configurations, the affects of mismatch between pumps & more.

Don't Miss Out. Sign Up Today!

FREE Facilities Engineer Webinar Series!
www.jmcampbell.com/webinar

Build Your Knowledge – Build Your Skills – Build Your Career

Campbell Courses **Delivered Exclusively**

ANY COURSE DELIVERED EXCLUSIVELY YOUR LOCATION YOUR TEAM

IN-HOUSE COURSES allow participants to receive comprehensive training and individualized attention from top instructors. They are an excellent solution to training needs when travel budgets are reduced. Using our resources, we can develop customized and relevant training programs on virtually any petroleum related subject while incorporating a company's own data into the curriculum. All course attendees are limited to your internal employees and can be held anywhere you need training.

NOT ENOUGH PARTICIPANTS FOR AN IN-HOUSE COURSE?

CONSIDER A SPONSORED PUBLIC COURSE

SPONSORED PUBLIC COURSES are courses held using our standard course material for 2 or more clients, each committing 5-8 registrations. The course location is arranged with the sponsoring client, then John M. Campbell & Co. opens registration to the public to fill the session.

CAMPBELL COURSES TAILORED TO FIT YOUR NEEDS

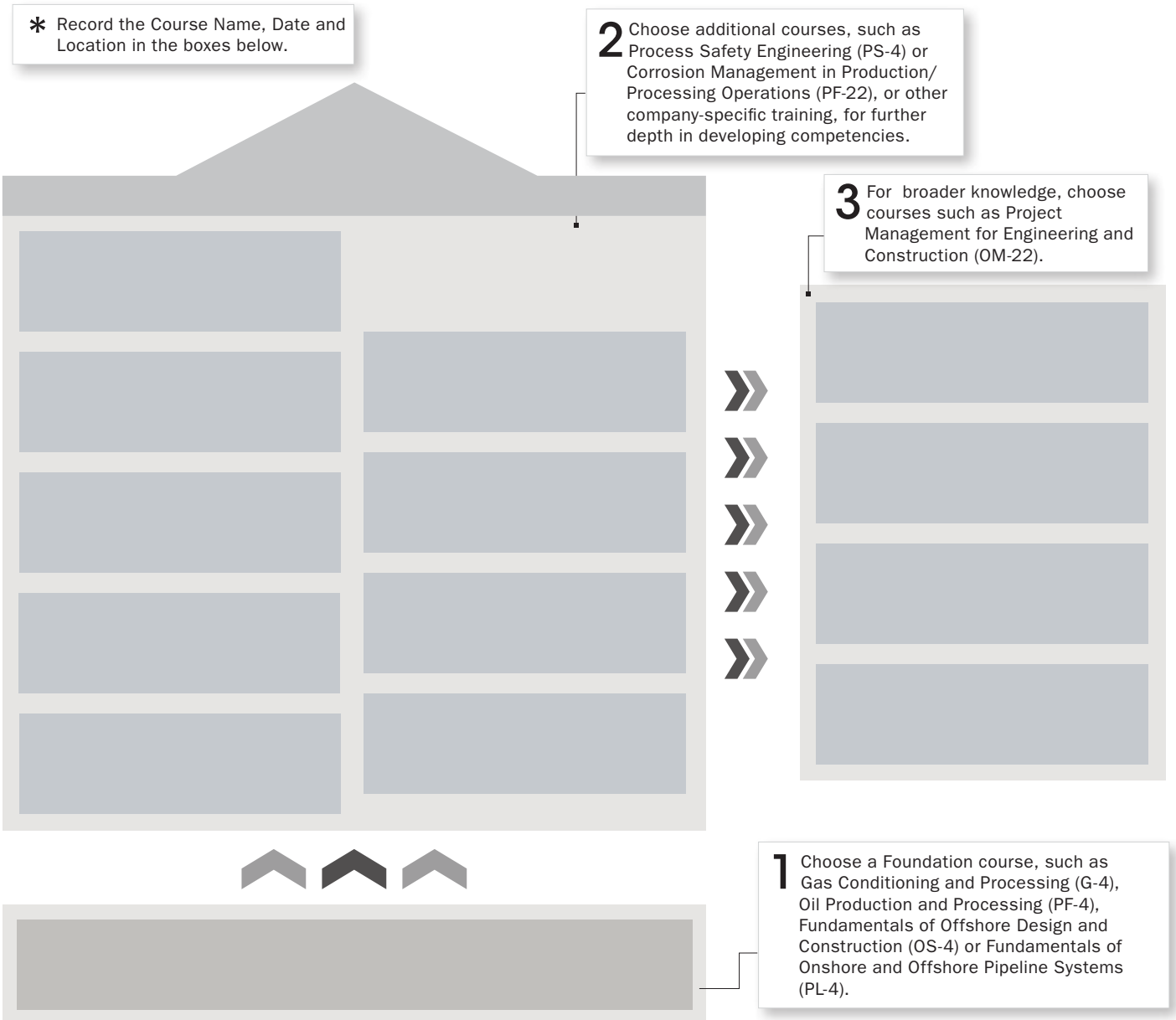
CUSTOMIZED COURSES are for clients who come to us with training requests that require specific geographic or asset-based learning requirements. These customized courses typically use part of an existing Campbell course that is then enhanced with additional content. The content can be developed by Campbell exclusively, or it can be developed collaboratively with input and direction from the client. Customized courses, once developed, often become a regularly scheduled course in the client's training program. They can be delivered face-to-face or online, and with mentoring or remote coaching.

Let us help you get your facilities engineers the training they need.
To schedule an in-house or sponsored course, email us at **jmcsupport@jmcampbell.com**.

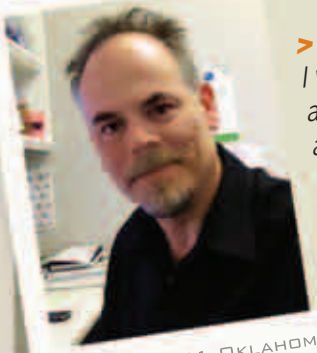
Personal Fast-Track

MY PERSONAL FAST-TRACK TO COMPETENCY (3-YEAR PLAN)

You know what your career goals are but have you figured out the best way to get there? Comprehensive self-assessment can highlight areas in which you may need training. Use this chart to develop your own personal FastTrack to competency progression.



Campbell Training



> I just wanted to tell you that I really enjoyed the class….. I would recommend this class to every work group we are associated with. I think you did a great job talking to your audience and really being able to communicate high level engineering concepts. A good teacher is one that can adapt to their students. To me that is the true mark of a good instructor and it is my belief that you did a fantastic job. <

• Tony, ME-41 Oklahoma City 2012

> I enjoyed the training and the interactions. I have made significant contributions to an on-going project using knowledge acquired during the training. Thanks for being able to pass on to us that vast knowledge of yours. We appreciate and look forward to good success. Thank you all for making it a fun-training. <

• Curtis, PF-21 Houston 2012

> I loved the key learning points sessions! I loved the close follow-up and familiarity with the text book. I really liked the exercises and the frequent breaks to keep fresh and alert. And of course the instructor's positive and highly encouraging attitude. <

• Mirna, G-4 Bergen 2008

ANY COURSE. ANY TIME. ANY PLACE.

John M. Campbell & Co. is committed to make training as convenient as possible. That's why we offer our courses in areas known to be hubs of oil and gas activity, minimizing your travel and other related costs thereby adding value to our courses.

Don't see the course you need on our schedule? Any course listed in our catalog or on our website can be scheduled on an In-House or Sponsored Public basis at the location of your choice.

So whether you are looking for training for yourself or your entire team, John M. Campbell & Co. offers an option to fit your needs.

To learn more, email jmcsupport@jmcampbell.com or call +1-405-321-1383.

Around the World

> Regularly doing the key learning points in the classroom greatly helped me understand and remember more items in the course. I found it easier to understand the topics, even though my current and past background is not the refinery business. I am from the upstream gas processing business. <

• ADHI, RF-61 LONDON 2008

> Your Instructor did a great job here in Brisbane. <

• BRIAN, OT-1 BRISBANE 2012

> The SS-2 course was a comprehensive and interactive introduction to the constraints and drivers that influence the lifecycle of a subsea system. In particular, the trainer encouraged debate wherein he shared his international experience and created the opportunity for the group to contribute knowledge of their specific discipline or involvement in past and current subsea developments. I appreciated the open environment to ask questions and attendees sharing their experiences and knowledge. <

• MARK, SS-2 ABERDEEN 2008

> To be honest, this was one of the best and most useful trainings I have taken date. Approaching the future, we are more and more dependent on software and tools to help us design. But your course gave us a good insight on how calculations are done and the software is only a helping aid to speed up the calculation and increase accuracy. Your course gave me a good sense for verifying calculations. I hope you don't retire soon, because we young engineers need people who can deliver materials in a sophisticated and comprehensive way without making it too complicated. <

• TEGAR, INDONESIA 2012

> The red thread exercise and video helped a lot to realize how big a structure could be and how complex the installation process is. <

• PIYARAT, OS-2 SINGAPORE 2008

2013 Scheduled Courses

CODE	COURSE TITLE	LOCATION	START DATE	END DATE	TUITION	PG
G-5	Gas Conditioning and Processing - Special	Calgary	1/14/13	1/18/13	$4,408.00	21
G-4	Gas Conditioning and Processing	London	1/21/13	2/1/13	$8,985.00	18
PF-4	Oil Production & Processing Facilities	Houston	1/28/13	2/8/13	$7,848.00	23
G-4	Gas Conditioning and Processing	Houston	2/4/13	2/15/13	$7,848.00	18
PF-42	Separation Equipment - Selection & Sizing	Houston	2/4/13	2/8/13	$3,846.00	26
G-4	Gas Conditioning and Processing	Doha	2/10/13	2/21/13	$8,836.00	18
E-3	Electrical Engineering Fundamentals for Facilities Engineers	Houston	2/11/13	2/15/13	$3,846.00	32
PS-4	Process Safety Engineering	Houston	2/11/13	2/15/13	$3,846.00	21
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Houston	2/18/13	2/22/13	$3,846.00	32
G-4	Gas Conditioning and Processing	Calgary	3/4/13	3/15/13	$7,848.00	18
ME-41	Piping Systems - Mechanical Design and Specification	Houston	3/4/13	3/8/13	$3,846.00	34
OM-22	Project Management for Engineering and Construction	Houston	3/4/13	3/8/13	$3,529.00	38
G-4	Gas Conditioning and Processing	Stavanger	3/11/13	3/22/13	$8,985.00	18
G-6	Gas Treating and Sulfur Recovery	Houston	3/11/13	3/15/13	$4,174.00	21
ME-44	Fundamentals of Pump and Compressor Systems	Houston	3/11/13	3/15/13	$3,846.00	34
ME-47	Rotating Machinery Best Practices	London	3/11/13	3/15/13	$4,774.00	35
OM-21	Applied Maintenance Management	Houston	3/11/13	3/15/13	$3,529.00	38
PF-4	Oil Production & Processing Facilities	Kuala Lumpur	3/11/13	3/22/13	$8,102.00	23
PF-81	CO2 Surface Facilities	Calgary	3/11/13	3/13/13	$2,772.00	27
G-2	Overview of Gas Processing - Technical	London	3/18/13	3/20/13	$3,308.00	17
ICE-21	Instrumentation, Controls and Electrical Systems for Facilities Engineers	Bakersfield	3/18/13	3/22/13	$3,846.00	32
PF-21	Applied Water Technology in Oil and Gas Production	London	3/18/13	3/22/13	$4,774.00	25
PF-44	Relief and Flare Systems	Houston	3/18/13	3/22/13	$3,846.00	26
REL-41	Rotating Equipment Reliability Optimization	London	3/18/13	3/22/13	$4,774.00	36
SC-41	Contracts and Tenders Fundamentals	Houston	3/19/13	3/21/13	$2,471.00	43
PS-4	Process Safety Engineering	Kuala Lumpur	3/25/13	3/29/13	$4,856.00	21
G-4	Gas Conditioning and Processing	Aberdeen	4/8/13	4/19/13	$8,985.00	18
OS-21	Overview of Offshore Systems	London	4/8/13	4/12/13	$4,774.00	29
OS-4	Fundamentals of Offshore Systems Design and Construction	Houston	4/8/13	4/19/13	$6,858.00	29
ME-44	Fundamentals of Pump and Compressor Systems	London	4/15/13	4/19/13	$4,774.00	34
PL-42	Onshore Pipeline Facilities - Design, Construction and Operations	Houston	4/15/13	4/19/13	$3,846.00	31
ICE-21	Instrumentation, Controls and Electrical Systems for Facilities Engineers	Doha	4/21/13	4/25/13	$4,770.00	32
PS-4	Process Safety Engineering	Doha	4/21/13	4/25/13	$4,882.00	21
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Calgary	4/22/13	4/26/13	$3,846.00	32
ME-41	Piping Systems - Mechanical Design and Specification	London	4/22/13	4/26/13	$4,774.00	34
ME-47	Rotating Machinery Best Practices	Houston	4/22/13	4/26/13	$3,846.00	35
OM-23	Essential Leadership Skills for Technical Professionals	Houston	4/22/13	4/26/13	$3,529.00	39
PF-4	Oil Production & Processing Facilities	Bakersfield	4/22/13	5/3/13	$7,848.00	23
PS-4	Process Safety Engineering	Perth	4/22/13	4/26/13	$4,770.00	21
SS-2	Fundamentals of Subsea Systems	Houston	4/22/13	4/26/13	$3,846.00	29
G-4LNG	Gas Conditioning and Processing - LNG Emphasis	Perth	4/29/13	5/10/13	$9,128.00	20
OM-41	Maintenance Planning and Work Control	Houston	4/29/13	5/3/13	$3,529.00	38
REL-41	Rotating Equipment Reliability Optimization	Houston	4/29/13	5/3/13	$3,846.00	36
G-4	Gas Conditioning and Processing	Washington, D.C.	5/6/13	5/17/13	$7,848.00	18
G-5	Gas Conditioning and Processing - Special	Houston	5/13/13	5/17/13	$4,408.00	21
G-29	LNG Short Course: Technology and the LNG Chain	London	5/13/13	5/17/13	$4,774.00	17
IC-71	PLC and SCADA Technologies	London	5/13/13	5/17/13	$4,774.00	33
PF-47	Process Utility Systems	Houston	5/13/13	5/17/13	$3,846.00	27
REL-4	Optimizing Asset Availability Using Reliability Engineering	Houston	5/13/13	5/17/13	$3,846.00	36
IC-72	Valve and Actuator Technologies	London	5/20/13	5/24/13	$4,774.00	33
PS-4	Process Safety Engineering	London	5/20/13	5/24/13	$4,774.00	21

CODE	COURSE TITLE	LOCATION	START DATE	END DATE	TUITION	PG
OT-1	Operator Training for Oil & Gas Processing Facilities	Stavanger	6/3/13	6/7/13	$4,586.00	41
PF-44	Relief and Flare Systems	Aberdeen	6/3/13	6/7/13	$4,774.00	26
SS-2	Fundamentals of Subsea Systems	London	6/3/13	6/7/13	$4,774.00	29
PF-4	Oil Production & Processing Facilities	London	6/10/13	6/21/13	$8,144.00	23
PF-47	Process Utility Systems	Aberdeen	6/10/13	6/14/13	$4,774.00	27
G-4	Gas Conditioning and Processing	Denver	6/17/13	6/28/13	$7,848.00	18
ICE-21	Instrumentation, Controls and Electrical Systems for Facilities Engineers	London	6/17/13	6/21/13	$4,774.00	32
OS-4	Fundamentals of Offshore Systems Design and Construction	Lagos	6/17/13	6/28/13	$7,649.00	29
G-4	Gas Conditioning and Processing	London	6/24/13	7/5/13	$8,985.00	18
G-4LNG	Gas Conditioning and Processing - LNG Emphasis	Rio de Janeiro	7/8/13	7/19/13	$8,344.00	20
PF-4	Oil Production & Processing Facilities	Denver	7/8/13	7/19/13	$7,848.00	23
PF-45	Onshore Gas Gathering Systems: Design & Operations	Denver	7/15/13	7/19/13	$3,846.00	27
G-29	LNG Short Course: Technology and the LNG Chain	Perth	7/22/13	7/26/13	$4,770.00	17
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Denver	7/22/13	7/26/13	$3,846.00	32
ME-41	Piping Systems - Mechanical Design and Specification	Denver	7/22/13	7/26/13	$3,846.00	34
OS-21	Overview of Offshore Systems	Houston	7/22/13	7/26/13	$3,846.00	29
ME-44	Fundamentals of Pump and Compressor Systems	Denver	7/29/13	8/2/13	$3,846.00	34
PL-42	Onshore Pipeline Facilities - Design, Construction and Operations	Denver	7/29/13	8/2/13	$3,846.00	31
PS-4	Process Safety Engineering	Calgary	7/29/13	8/2/13	$3,846.00	21
G-4	Gas Conditioning and Processing	Perth	8/5/13	8/16/13	$9,128.00	18
G-5	Gas Conditioning and Processing - Special	Denver	8/5/13	8/9/13	$4,408.00	21
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Perth	8/5/13	8/9/13	$4,770.00	32
OT-1	Operator Training for Oil & Gas Processing Facilities	Brisbane	8/5/13	8/9/13	$4,578.00	41
G-29	LNG Short Course: Technology and the LNG Chain	Houston	8/12/13	8/16/13	$3,846.00	17
PF-21	Applied Water Technology in Oil and Gas Production	Houston	8/12/13	8/16/13	$3,846.00	25
PF-4	Oil Production & Processing Facilities	Calgary	8/12/13	8/23/13	$7,848.00	23
PS-4	Process Safety Engineering	Brisbane	8/12/13	8/16/13	$4,770.00	21
SS-2	Fundamentals of Subsea Systems	Singapore	8/12/13	8/16/13	$4,856.00	29
G-2	Overview of Gas Processing - Technical	Houston	8/13/13	8/15/13	$2,772.00	17
PF-22	Corrosion Management in Production/Processing Operations	Houston	8/19/13	8/23/13	$2,048.00	25
PF-44	Relief and Flare Systems	Perth	8/19/13	8/23/13	$4,770.00	26
SC-61	Inside Procurement in Oil and Gas	Houston	8/27/13	8/29/13	$2,471.00	43
ME-41	Piping Systems - Mechanical Design and Specification	London	9/2/13	9/6/13	$4,774.00	34
OS-4	Fundamentals of Offshore Systems Design and Construction	Singapore	9/2/13	9/13/13	$7,344.00	29
G-4	Gas Conditioning and Processing	Houston	9/9/13	9/20/13	$7,848.00	18
ME-44	Fundamentals of Pump and Compressor Systems	London	9/9/13	9/13/13	$4,774.00	34
OS-21	Overview of Offshore Systems	Houston	9/9/13	9/13/13	$3,846.00	29
PF-4	Oil Production & Processing Facilities	Stavanger	9/9/13	9/20/13	$8,144.00	23
PS-4	Process Safety Engineering	Houston	9/9/13	9/13/13	$3,846.00	21
G-4	Gas Conditioning and Processing	Aberdeen	9/16/13	9/27/13	$8,985.00	18
G-2	Overview of Gas Processing - Technical	Stavanger	9/17/13	9/19/13	$3,308.00	17
G-40	Process/Facility Fundamentals	Houston	9/23/13	9/27/13	$3,846.00	20
ICE-21	Instrumentation, Controls and Electrical Systems for Facilities Engineers	Houston	9/23/13	9/27/13	$3,846.00	32
SS-2	Fundamentals of Subsea Systems	Orlando	9/23/13	9/27/13	$3,846.00	29
ME-44	Fundamentals of Pump and Compressor Systems	Doha	9/29/13	10/3/13	$4,882.00	34
G-6	Gas Treating and Sulfur Recovery	London	9/30/13	10/4/13	$5,219.00	21
OS-4	Fundamentals of Offshore Systems Design and Construction	London	9/30/13	10/11/13	$7,649.00	29
ME-62	Turbomachinery Monitoring and Problem Analysis	Houston	9/30/13	10/4/13	$3,846.00	35
PF-44	Relief and Flare Systems	Houston	9/30/13	10/4/13	$3,846.00	26
REL-4	Optimizing Asset Availability Using Reliability Engineering	Dubai	9/30/13	10/4/13	$4,770.00	36
FPM-62	Advanced Project Management	Houston	9/30/13	10/4/13	$3,529.00	39
SC-42	Effective Materials Management	Houston	10/1/13	10/3/13	$2,471.00	43
ME-41	Piping Systems - Mechanical Design and Specification	Dubai	10/6/13	10/10/13	$4,882.00	34
PL-42	Onshore Pipeline Facilities - Design, Construction and Operations	Dubai	10/6/13	10/10/13	$4,882.00	31
G-4	Gas Conditioning and Processing	Kuala Lumpur	10/7/13	10/18/13	$8,880.00	18
OM-42	Managing Brownfield Projects	Orlando	10/7/13	10/11/13	$3,529.00	39

CODE	COURSE TITLE	LOCATION	START DATE	END DATE	TUITION	PG
PS-4	Process Safety Engineering	London	10/7/13	10/11/13	$4,743.00	21
IC-71	PLC and SCADA Technologies	Houston	10/8/13	10/12/13	$3,846.00	33
IC-72	Valve and Actuator Technologies	Houston	10/14/13	10/18/13	$3,846.00	33
OM-22	Project Management for Engineering and Construction	Houston	10/14/13	10/18/13	$3,529.00	38
OM-41	Maintenance Planning and Work Control	Orlando	10/14/13	10/18/13	$3,529.00	38
ME-44	Fundamentals of Pump and Compressor Systems	Rio de Janeiro	10/14/13	10/18/13	$4,346.00	34
PS-4	Process Safety Engineering	Rio de Janeiro	10/14/13	10/18/13	$4,346.00	21
PF-42	Separation Equipment - Selection & Sizing	Orlando	10/14/13	10/18/13	$3,846.00	26
SC-41	Contracts and Tenders Fundamentals	Orlando	10/15/13	10/17/13	$2,471.00	43
E-3	Electrical Engineering Fundamentals for Facilities Engineers	Orlando	10/21/13	10/25/13	$3,846.00	32
G-5	Gas Conditioning and Processing - Special	Houston	10/21/13	10/25/13	$4,408.00	21
ME-46	Compressor Systems - Mechanical Design and Specification	Orlando	10/21/13	10/25/13	$3,846.00	34
PF-4	Oil Production & Processing Facilities	Orlando	10/21/13	11/1/13	$7,848.00	23
PF-44	Relief and Flare Systems	Kuala Lumpur	10/21/13	10/25/13	$4,856.00	26
G-4	Gas Conditioning and Processing	Houston	10/28/13	11/8/13	$7,848.00	18
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Orlando	10/28/13	11/1/13	$3,846.00	32
ME-47	Rotating Machinery Best Practices	Orlando	10/28/13	11/1/13	$3,846.00	35
PF-45	Onshore Gas Gathering Systems: Design & Operations	Houston	10/28/13	11/1/13	$3,846.00	27
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Dubai	11/3/13	11/7/13	$4,770.00	32
G-4	Gas Conditioning and Processing	Orlando	11/4/13	11/15/13	$7,848.00	18
G-4	Gas Conditioning and Processing	Stavanger	11/4/13	11/15/13	$8,985.00	18
ME-41	Piping Systems - Mechanical Design and Specification	Orlando	11/4/13	11/8/13	$3,846.00	34
PS-4	Process Safety Engineering	Orlando	11/4/13	11/8/13	$3,846.00	21
REL-41	Rotating Equipment Reliability Optimization	Orlando	11/4/13	11/8/13	$3,846.00	36
SC-41	Contracts and Tenders Fundamentals	Houston	11/5/13	11/7/13	$2,471.00	43
ME-44	Fundamentals of Pump and Compressor Systems	Orlando	11/11/13	11/15/13	$3,846.00	34
OT-1	Operator Training for Oil & Gas Processing Facilities	Midland	11/11/13	11/15/13	$3,691.00	41
PF-21	Applied Water Technology in Oil and Gas Production	Orlando	11/11/13	11/15/13	$3,846.00	25
PF-4	Oil Production & Processing Facilities	Bakersfield	11/11/13	11/22/13	$7,848.00	23
PL-42	Onshore Pipeline Facilities - Design, Construction and Operations	Orlando	11/11/13	11/15/13	$3,846.00	31
PF-4	Oil Production & Processing Facilities	Doha	11/17/13	11/28/13	$8,836.00	23
G-4	Gas Conditioning and Processing	Dubai	11/17/13	11/28/13	$8,836.00	18
ME-44	Fundamentals of Pump and Compressor Systems	Dubai	11/17/13	11/21/13	$4,882.00	34
IC-3	Instrumentation and Controls Fundamentals for Facilities Engineers	Houston	11/18/13	11/22/13	$3,846.00	32
PF-22	Corrosion Management in Production/Processing Operations	Orlando	11/18/13	11/22/13	$2,048.00	25
PF-81	CO2 Surface Facilities	Midland	11/18/13	11/21/13	$2,772.00	27
PL-4	Fundamentals of Onshore and Offshore Pipeline Systems	Kuala Lumpur	11/18/13	11/29/13	$7,344.00	31
G-4LNG	Gas Conditioning and Processing - LNG Emphasis	Doha	11/24/13	12/5/13	$8,836.00	20
G-4	Gas Conditioning and Processing	Brisbane	12/2/13	12/13/13	$9,128.00	18
G-6	Gas Treating and Sulfur Recovery	Orlando	12/2/13	12/6/13	$4,174.00	21
ME-44	Fundamentals of Pump and Compressor Systems	Kuala Lumpur	12/2/13	12/6/13	$4,856.00	34
PF-4	Oil Production & Processing Facilities	Houston	12/2/13	12/13/13	$7,848.00	23
OS-21	Overview of Offshore Systems	Orlando	12/2/13	12/6/13	$3,846.00	29
REL-4	Optimizing Asset Availability Using Reliability Engineering	Orlando	12/2/13	12/6/13	$3,846.00	36
G-2	Overview of Gas Processing - Technical	Kuala Lumpur	12/3/13	12/5/13	$3,591.00	17
G-6	Gas Treating and Sulfur Recovery	Doha	12/8/13	12/12/13	$4,882.00	21
PF-4	Oil Production & Processing Facilities	Dubai	12/8/13	12/19/13	$8,144.00	23
PF-44	Relief and Flare Systems	Dubai	12/8/13	12/12/13	$4,904.00	26
G-5	Gas Conditioning and Processing - Special	Dubai	12/8/13	12/12/13	$5,219.00	21
ME-41	Piping Systems - Mechanical Design and Specification	Brisbane	12/9/13	12/13/13	$4,770.00	34
OM-23	Essential Leadership Skills for Technical Professionals	Orlando	12/9/13	12/13/13	$3,529.00	39
PF-47	Process Utility Systems	Orlando	12/9/13	12/13/13	$3,846.00	27
PS-4	Process Safety Engineering	Dubai	12/15/13	12/19/13	$4,882.00	21
PS-4	Process Safety Engineering	Bakersfield	12/15/13	12/19/13	$3,846.00	21
OM-21	Applied Maintenance Management	Orlando	12/16/13	12/20/13	$3,529.00	38

Announcing an Important NEW COURSE:

Advanced Project Management

FPM-62

Acquire Advanced Skills on Project Management and Avoid:

- Missed deadlines
- Scope creep
- Schedule delays
- No bids resulting in delays
- Contract strategies that don't match the market
- Cost increases due to inclusion of "risk money" by bidders

You will Learn:

- How to assess project governance structures and create a plan to facilitate decision making.
- What are the best mitigation strategies that allow you to manage project risks effectively.
- How to identify internal and external stakeholders and address their needs.
- How to properly create a decision support package that successfully navigates the reviews and approval process.
- What the true risks are associated with technology selection.
- How to establish a program to identify and manage project interfaces.
- How to identify the information sources and reporting requirements for information systems used on large international projects.

ADVANCED Project Management: (FPM-62)

Enroll today at jmcampbell.com/fpm62

Gas Processing Engineer Course Progression

The Gas Processing Progression covers equipment and processes primarily focused on the handling of natural gas and its associated liquids. The wellhead is the starting point, ending with delivery of the processed gas, meeting the required specifications, into a sales gas or reinjection pipeline. Recovered natural gas liquids (NGL), again meeting the required specifications, are delivered to an export point – either a pipeline or storage facility. The NGL may be fractionated into individual specification products or sold as a mix for fractionation elsewhere. Waste by-products are disposed of in accordance with the applicable regulatory requirements. Main topics covered include: fundamentals, natural gas characterization, phase behavior, vapor–liquid equilibrium, basic thermodynamics, and water–hydrocarbon behavior and all the key equipment to process natural gas. Campbell Training delivers competency-based training in these and other areas, at progressive levels to provide the skills necessary to successfully support the operation of oil and gas production processes.

GAS PROCESSING ENGINEER 3-YEAR COURSE PROGRESSION

Below is an example of a 3-year course progression covering topics we believe critical to developing technically strong Gas Processing Engineers.

2 Additonal courses offer further depth in developing competencies.

- **Gas Treating and Sulfur Recovery** (G-6) — PG 21
- **Corrosion Management in Production/Processing Operations** (PF-22) — PG 25
- **Compressor Systems: Mechanical Design & Specification** (ME-46) — PG 34
- **Onshore Gas Gathering Systems: Design & Operation** (PF-45) — PG 27
- **Process Utility Systems** (PF-47) — PG 27
- **Separation Equipment Selection and Sizing** (PF-42) — PG 26
- **Heat Transfer Equipment** (PF-43) — PG 26
- **Relief and Flare Systems** (PF-44) — PG 26
- **Process Safety Engineering** (PS-4) — PG 21
- **Instrumentation, Controls & Electrical Systems for Facilities Engineers** (ICE-21) — PG 32

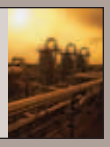
3 For broader knowledge, these courses are recommended.

- **Project Management for Engineering and Construction** (OM-22) — PG 38
- **CO_2 Surface Facilities** (PF-81) — PG 27
- **Overview of Offshore Systems** (OS-21) — PG 29
- **LNG Short Course: Technology and the LNG Chain** (G-29) — PG 17

- **Gas Conditioning and Processing** (G-4) — PG 18

1 A 3-year progression for a Gas Processing Engineer would begin with the Gas Conditioning and Processing Course (G-4).

Overview of Gas Processing Non-Technical (G-1)



BASIC - 2 DAYS

DESIGNED FOR
General administration, supervisory, non-technical management personnel, as well as anyone that could benefit from a broad overview of important aspects of the gas processing industry.

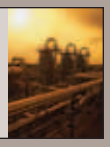
YOU WILL LEARN
- Oil and gas facilities terminology
- Fundamentals of commercial and contract issues
- Key areas in oil and gas production surface facilities
- How gas is transported and sold
- Non-technical fundamentals of technology and processes
- Why various treatment processes and technologies are selected for differing gas compositions and processing applications
- Markets and uses for natural gas liquids

ABOUT THE COURSE
This course is designed for a broad non-technical audience. While the course is intended to be interactive and participatory, most technical calculations are eliminated and use of technical terminology is minimized.

COURSE CONTENT
- Basic concepts & fundamentals of natural gas
- Industry overview
- Natural gas composition and specifications
- Process facilities
- Gas properties and behavior
- Gas flow fundamentals
- Natural gas treating
- Overview of sulfur recovery and disposal
- Gas dehydration
- Conditioning and processing of natural gas
- Liquid product fractionation and treating
- Gas compression
- Transportation systems

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Overview of Gas Processing Technical (G-2)



BASIC - 3 DAYS

DESIGNED FOR
G-2 is a versatile overview of the gas conditioning and processing industry based on highly condensed material from Campbell's G-4 and G-6 courses. As a wide ranging overview, it is suitable for interested parties, such as geologists, reservoir engineers, line managers, sales and business development staff, related specialists such as environmental staff, operational staff, shift foremen, or those new to the industry such as entry-level engineers, as well as anyone interested in a general, technically oriented overview of the gas processing industry.

YOU WILL LEARN
- Overview of world energy trends, natural gas, and the role of gas processing and conditioning
- Natural gas sources, makeup, properties, specifications, and related oil and gas terminology
- How gas is transported and sold
- Field operations that support gas processing
- Options for various basic gas conditioning and processing steps: treating, dehydration, liquid extraction, and product fractionation and treating
- Key commercial and contract issues in liquids extraction
- Principles of gas measurement and common measurement devices
- Markets and uses for NGL, LPG, ethane, propane and butane
- Key pieces of equipment used in natural gas production and processing facilities
- Overview of related specialty processes such as LNG, nitrogen rejection and helium recovery, and sulfur recovery and acid gas reinjection

ABOUT THE COURSE
This course is designed for a broad audience. It is participative and interactive, and utilizes fundamental technical exercises and terminology to communicate key learning points.

COURSE CONTENT
- Natural Gas and World Energy Trends
- A Closer Look at Natural Gas
- Gas Sweetening
- Gas Hydrates and Dehydration
- Phase Behavior and Phase Envelopes
- Stabilization and Fractionation Concepts and Facilities
- Gas Conditioning (Dew Point Control) and NGL Extraction
- Gas Processing Key Equipment and Support Systems (Heat Transfer, Compression, Pipelines, and Gathering Systems Measurement)
- Specialty Processes in Gas Processing (LNG, Nitrogen Rejection and Helium Recovery, and Sulfur Recovery and Acid Gas Reinjection)
- Special Topics in Gas Processing

2013 SCHEDULE AND TUITION

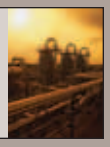
LONDON
18-20 MAR 2013 . . . . . US $3,308

HOUSTON
13-15 AUG 2013 . . . . . US $2,772

STAVANGER
17-19 SEP 2013 . . . . . US $3,308

KUALA LUMPUR
3-5 DEC 2013 . . . . . US $3,591

LNG Short Course: Technology and the LNG Chain (G-29)



BASIC - 5 DAYS

DESIGNED FOR
Technical, engineering and operations staff, as well as commercial and management staff who require a technical overview of the LNG industry.

YOU WILL LEARN
- LNG industry review; LNG facilities around the world
- A review of commercial and contractual issues
- About project costs, feasibility and development
- Some fundamentals of gas processing technology
- To apply knowledge of gas pretreatment and refrigeration to the liquefaction process
- To be familiar with liquefaction technologies and appreciate the differences
- About the heat exchangers used in cryogenic processes
- About compressors and the drivers including gas turbines and electric motors
- About LNG storage
- Understand the importance of marine issues and the various types of LNG carriers
- LNG import facilities and regasification of LNG and the utilization of cold energy from LNG
- Become aware of offshore LNG operations (FLNG and FSRU)

ABOUT THE COURSE
Technical LNG basics are covered in this intensive short course. It provides an overview of the technology in the LNG chain. The course covers facility operation topics, technical and design issues. Key commercial issues are also discussed. Selected exercises and syndicates are used throughout the course. In-House versions are available with either increased technical and operational emphasis or increased project and development emphasis.

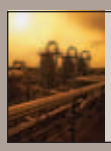
COURSE CONTENT
- Introduction to LNG
- Commercial issues
- Technical fundamentals
- Gas processing basics
- Major equipment
- Refrigeration and LNG liquefaction
- Shipping
- LNG storage
- Regasification terminals and energy recovery
- Future trends in LNG, off-shore LNG

2013 SCHEDULE AND TUITION

LONDON
13-17 MAY 2013 . . . . . US $4,774

PERTH
22-26 JUL 2013 . . . . . US $4,770

HOUSTON
12-16 AUG 2013. . . . . US $3,846



GAS CONDITIONING AND PROCESSING (G-4)

FOUNDATION - 10 DAYS

DESIGNED FOR

Production and processing personnel involved with natural gas and associated liquids to acquaint or reacquaint themselves with gas conditioning and processing unit operations. This course is for facilities engineers, process engineers, senior operations personnel, field supervisors and engineers that select, design, install, evaluate or operate gas processing plants and related facilities. A broad approach is taken with the topics.

YOU WILL LEARN

- About the selection and evaluation of processes used to dehydrate natural gas, meet hydrocarbon dewpoint specifications and extract NGLs
- Application of gas engineering and technology in facilities and gas plants
- Important specifications for gas, NGL and condensate
- How to apply physical/thermodynamic property correlations and principles to the operation, design and evaluation of gas processing facilities
- Practical equipment sizing methods for major process equipment
- To evaluate technical validity of discussions related to gas processing
- To recognize and develop solutions to example operating problems and control issues in gas processing facilities

ABOUT THE COURSE

The "Campbell Gas Course™" has been the standard of the industry for forty years. Over 30,000 engineers have attended our G-4 program, considered by many to be the most practical and comprehensive course in the oil and gas industry. Both hand-methods and computer-aided analysis are used to examine sensitivities of technical decisions. To enhance the learning process, about 30 problems will be assigned, reviewed and discussed throughout the course. Problems will be solved individually and in teams.

COURSE CONTENT

· Gas processing systems · Physical properties of hydrocarbons · Terminology and nomenclature · Qualitative phase behavior · Vapor-liquid equilibrium · Water-hydrocarbon phase behavior, hydrates etc · Basic thermodynamic concepts · General system energy changes and rate processes · Process control fundamentals · Fluid hydraulics; two-phase flow · Separation equipment · Heat transfer, heat exchangers · Pumps · Compressors and gas turbines · Refrigeration · Fractionation/distillation · Glycol dehydration; TEG · Adsorption systems, molecular sieves

SEE SAMPLE COURSE OUTLINE AND DAILY SCHEDULE ON PAGE 19.

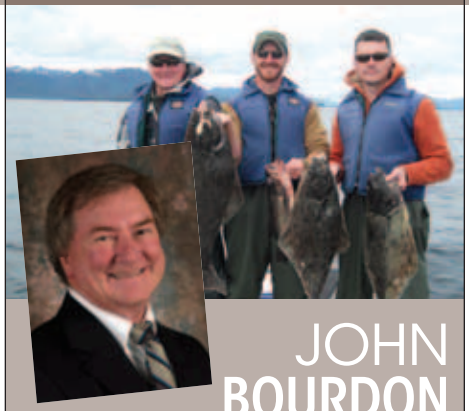
2013 SCHEDULE AND TUITION

LONDON	
21 JAN - 1 FEB 2013	US $8,985
HOUSTON	
4-15 FEB 2013	US $7,848
DOHA	
10-21 FEB 2013	US $8,836
CALGARY	
4-15 MAR 2013	US $7,848
STAVANGER	
11-22 MAR 2013	US $8,985
ABERDEEN	
8-19 APR 2013	US $8,985
WASHINGTON DC	
6-17 MAY 2013	US $7,848
DENVER	
17-28 JUN 2013	US $7,848
LONDON	
24 JUN - 5 JUL 2013	US $8,985
PERTH	
5-16 AUG 2013	US $9,128
HOUSTON	
9-20 SEP 2013	US $7,848
ABERDEEN	
16-27 SEP 2013	US $8,985
KUALA LUMPUR	
7-18 OCT 2013	US $8,880
HOUSTON	
28 OCT - 8 NOV 2013	US $7,848
STAVANGER	
4-15 NOV 2013	US $8,985
ORLANDO	
4-15 NOV 2013	US $7,848
DUBAI	
17-28 NOV 2013	US $8,836
BRISBANE	
2-13 DEC 2013	US $9,128

FOR UPDATED SCHEDULE INFORMATION OR TO ARRANGE AN IN-HOUSE SESSION OF THIS COURSE, CONTACT JMCSUPPORT@JMCAMPBELL.COM.

JOHN M. CAMPBELL & CO.

INSTRUCTOR SPOTLIGHT



JOHN BOURDON

What courses do you teach?

I teach our gas processing, LNG, and relief and flare courses.

Do you have a favorite city to visit?

I enjoy visiting Perth and Melbourne.

A favorite food from one of the cities in which you teach?

A couple of my favorites are Indian food in Aberdeen (the Mango Pickle) and Melbourne (The Curry Vault).

Do you have a favorite hobby you enjoy?

I really enjoy fishing as you can see in the photo where I am on the left. I was fishing with my two sons in Alaska.

Do you have a short story to share from a session?

I recently taught a G-4 course with 9 chemical engineers. They had recently graduated from university and were very sharp, so I was able to push the learning envelope and go into areas usually restricted by time. It was fun and challenging. We also had a great social evening at the Illicit Still there in Aberdeen where we practiced our skills in fractionation and distillation so common to our local market here in Scotland.

Gas Conditioning and Processing (G-4)
Course Outline

Considered by many to be the most practical and comprehensive course in the oil and gas industry, the "Campbell Gas Course™", has been attended by over 30,000 engineers. The standard of the industry for well over forty-four (44) years, Gas Conditioning and Processing (G-4) deals with the practical planning, design, specification and operation of gas processing and production systems.

GAS CONDITIONING AND PROCESSING (G-4)

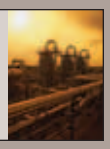
EXAMPLE OF DAY BY DAY COURSE TOPICS

DAY 1	Introduction to gas processing; gas and liquid contracts and specifications; gas process systems and options; physical properties of hydrocarbon fluids; and phase behavior. · Course Introduction · Gas Processing Systems · Physical Properties of Hydrocarbons · Qualitative Phase Behavior	DAY 6	Heat Exchangers - Overview, design and specification, shell and tube, plate, plate fin, heaters, cooling towers, and aerial coolers; pump principles; power and head; NPSH evaluation of pump performance and system curves; positive displacement and centrifugal pumps; and pump control. · Heat Transfer · Pumps
DAY 2	Principles of vapor-liquid equilibrium; K-values; dewpoints; bubblepoints; flash calculations; water content of natural gas; and hydrates. · Vapor-Liquid Equilibrium · Water-Hydrocarbon Behavior · Phase Envelopes and Flash Calculations	DAY 7	Overview and principles of compression including reciprocating and centrifugal compressors, power consumption, performance curves, axial compressors, compressor drivers and compressor control; principles of refrigeration including pressure vs. enthalpy charts, basic simple refrigeration cycle, economizer systems, power consumption, condenser load and mixed refrigerants; LTS/LTX processes; and turboexpanders. · Compressors · Refrigeration
DAY 3	Hydrate inhibition with glycols and alcohols, low dosage; energy balances; energy and power; tables of data; and basic thermodynamic concepts. · Water-Hydrocarbon Behavior (Cont'd) · Basic Thermodynamic Concepts · System Energy Changes	DAY 8	Fractionator operation, design and specification; mass transfer fundamentals; minimum reflux, theoretical trays; overall efficiency; energy balances; and oil stabilizers. · Refrigeration (Cont'd) · Fractionation · Refrigeration/Fractionation Exercise
DAY 4	Control modes (proportional, reset, derivative); valve characteristics; DCS and PLCs; flow measurement; examples of control applications, including liquid and gas flow, looped systems, complex systems and 2 phase horizontal and vertical flow. · Process Control Fundamentals · Fluid Flow · Consolidated Problem. NGL extraction for HC dewpoint control and hydrate inhibition.	DAY 9	Principles of glycol dehydration; glycol unit operation and design; absorber design and specification; equilibrium concepts; regeneration; coabsorption of aromatics; troubleshooting; foaming; and corrosion. · Fractionation (Cont'd) · Glycol Dehydration
DAY 5	Pressure vessel design; principles of separation; vessel sizing - vertical and horizontal, two/three phase; mist extraction; internals and specification; principles of rate processes; series and parallel resistance; and fundamentals of heat transfer. · Separation Equipment · Rate Processes	DAY 10	Operation and design of adsorption dehydration systems; properties of desiccants; sizing tower; regeneration requirements; and hydrocarbon recovery units. · Glycol Dehydration (Cont'd) · Adsorption Systems · Course Overview

FOR SCHEDULE AND TUITION INFORMATION, SEE PAGE 18

NOTE: Course schedule is approximate and may be adjusted for location and participant interest. G-4 is an intensive course and classroom hours are generally longer than a typical training course. Extended evening sessions are sometimes used for additional problems, exercises and syndicate work.

Gas Conditioning and Processing – LNG Emphasis (G-4LNG)



FOUNDATION - 10 DAYS

DESIGNED FOR

Personnel involved with natural gas processing and LNG production, as well as anyone interested in a solid understanding of the principles of an LNG plant. A broad approach is taken with the topics.

YOU WILL LEARN

- Fundamentals of gas processing and conditioning for the LNG industry
- How gas engineering and technology is applied in LNG facilities
- About important specifications for gas, LNG, NGLs and condensate
- To select and evaluate processes used to dehydrate natural gas and remove heavy components
- Other contaminants in LNG feed-gas
- Techniques to extract NGLs for LNG plants
- Important topics of H_2S and CO_2 removal before liquefaction
- Physical/thermodynamic property correlations and principles, including heating values, etc. as applied to gas processing facilities and LNG plants
- How to perform and review equipment sizing for major process equipment
- Fundamentals of propane, propane pre-cooled mixed refrigerant and cascade refrigerant systems as used in LNG plants
- Key points in other LNG liquefaction technologies
- Overview of LNG storage, transportation, and revaporization

ABOUT THE COURSE

This is the LNG-industry version of our popular G-4 course (the "Campbell Gas Course™") with expanded coverage on refrigeration and liquefaction. The course includes in-depth information on basic LNG gas conditioning and processing. Instructors will explain the acid gas removal processes employed in LNG processes. Relevant details of both the mixed refrigerant and cascade processes in LNG liquefaction are described. Approximately 30 class exercises/problems are assigned, reviewed and discussed during the course. Versions of this course have been taught in many of the world's base-load and peak-shaving LNG plants.

COURSE CONTENT

- Basic gas technology principles
- Gas processing systems
- Terminology and nomenclature
- Properties of hydrocarbons – LNG focus
- Vapor-liquid phase behavior and equilibrium
- Water-hydrocarbon system behavior.
- Hydrates and Inhibition
- Thermodynamics of LNG processes
- Separation equipment
- Gas treatment, CO_2 and H_2S removal for liquefaction.
- Dehydration of natural gas – glycol, molecular sieves
- Heat transfer, heat exchangers
- Pumps and compressors; gas turbines
- Refrigeration systems
- LNG liquefaction technologies
- Fractionation and absorption
- Process control examples
- LNG storage, shipping and receiving overview
- Course review and summary

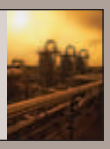
2013 SCHEDULE AND TUITION

PERTH
29 APR - 10 MAY 2013. . . . . US $9,128

RIO DE JANEIRO
8-19 JUL 2013. . . . . US $8,344

DOHA
24 NOV - 5 DEC 2013 . . . . . US $8,836

Process/Facility Fundamentals (G-40)



BASIC - 5 DAYS

DESIGNED FOR

Oil and gas process and facility personnel needing to understand gas processing fluid fundamentals and their applications to solve practical problems.

YOU WILL LEARN

- Technical fundamentals, property correlations, phase behavior and applied thermodynamics
- How to apply physical and thermodynamic property calculations with emphasis on limitations and applications to facility/equipment design
- How to apply phase behavior principles and phase diagrams to design and operating problems
- How to apply thermodynamic laws and principles to equipment design and operation

ABOUT THE COURSE

This course is designed for those who desire a brief but intensive overview of gas process engineering fluid principles. Course emphasis is on the application of engineering principles to solve operating and design issues common in gas processing facilities. Process simulation will be used throughout the course. The course is based on portions of Volume 1 of Campbell's Gas Conditioning and Processing.

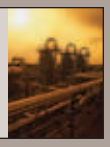
COURSE CONTENT

- Hydrocarbon phase behavior
- Vapor liquid equilibrium
- Physical properties of hydrocarbons
- Applied thermodynamics

2013 SCHEDULE AND TUITION

HOUSTON
23-27 SEP 2013 . . . . . US $3,846

Process Safety Engineering (PS-4)



FOUNDATION - 5 DAYS

DESIGNED FOR

Facilities, process and design engineers, supervisory/management personnel, as well as new safety/loss prevention engineers and HSE professionals who require an overview of Process Safety Engineering.

YOU WILL LEARN

· Types of equipment and process systems that have historically been problematic in the upstream oil & gas industry · Basics of risk analysis · Thinking in terms of Inherently Safer Design · Most commonly used process hazards analysis methods and where they are used · "Layers of Protection" concept - what the different layers are and how they are applied · Detection and mitigation methods for different types of hazards

ABOUT THE COURSE

This course provides an overview of process safety engineering fundamentals for hydrocarbon processing facilities, with emphasis on the upstream oil & gas sector. The focus of this course is on the engineering/design aspects of Process Safety Management. Frequent reference will be made to historical incidents and recurring problem areas. Techniques for analyzing and mitigating process safety hazards applicable to oil and gas processing will be reviewed. Integration of the concepts covered to achieve a measured approach to Process Safety Engineering is a key aim of this course. Exercises and group projects will be utilized throughout the course to emphasize the key learning points.

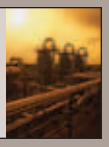
COURSE CONTENT

· Historical Incident & Problem Areas · Risk Analysis Basics · Process Hazards Analysis Techniques – Overview · Layers of Protection · Inherently Safer Design · Hazards Associated with Process Fluids · Leakage and Dispersion of Hydrocarbon Releases · Combustion Behavior of Hydrocarbons · Sources of Ignition · Hazards Associated with Specific Plant Systems · Plant Layout & Equipment Spacing · Pressure Relief and Disposal Systems · Corrosion & Materials Selection · Process Monitoring and Control · Safety Instrumented Systems · Fire Protection Principles · Explosion Protection

2013 SCHEDULE AND TUITION

HOUSTON
11-15 FEB 2013 ..... US $3,846
KUALA LUMPUR
25-29 MAR 2013 ..... US $4,856
DOHA
21-25 APR 2013 ..... US $4,882
PERTH
22-26 APR 2013 ..... US $4,770
LONDON
20-24 MAY 2013 ..... US $4,774
CALGARY
29 JUL - 2 AUG 2013 ..... US $3,846
BRISBANE
12-16 AUG 2013 ..... US $4,770
HOUSTON
9-13 SEP 2013 ..... US $3,846
LONDON
7-11 OCT 2013 ..... US $4,743
RIO DE JANEIRO
14-18 OCT 2013 ..... US $4,346
ORLANDO
4-8 NOV 2013 ..... US $3,846
BAKERSFIELD
15-19 DEC 2013 ..... US $3,846
DUBAI
15-19 DEC 2013 ..... US $4,882

Gas Conditioning and Processing – Special (G-5)



INTERMEDIATE - 5 DAYS

DESIGNED FOR

Engineers needing an intensive training in natural gas processing and associated liquids recovery processes with emphasis on the use and benefits of a simulation package. Those having a good understanding of basic sweet gas processing operations or who have attended the G4 Gas Conditioning and Processing course will benefit most from this course.

YOU WILL LEARN

- To determine the water content and hydrate formation conditions for gas streams using both a commercial process simulator and hand calculation methods
- Techniques to inhibit hydrate formation including injection of equilibrium inhibitors such as methanol and MEG
- Preliminary design and evaluation of TEG dehydration processes using quick hand calculations
- Design of processes used to control the hydrocarbon dew point of sales gas streams by removing NGL's using mechanical refrigeration processes
- Various techniques to optimize mechanical refrigeration systems
- How to use the process simulator to evaluate the impact that pressure and temperature changes have on the sizing of process equipment and levels of NGL recovery
- How to use short-cut distillation calculations to provide input to rigorous distillation simulations in order to obtain consistent convergence
- Which thermodynamic property correlations are the best applications for various gas processing systems
- Limitations associated with commercial simulation packages and how the simulation results can be quickly checked for relative accuracy

ABOUT THE COURSE

The course has been designed to cover sweet gas processing and NGL recovery topics in a 5-day format using a commercial simulator to perform calculations. A basic working knowledge of the commercial process simulation package being used will provide the best opportunity to achieve the learning objectives of this course. Volumes 1 and 2 of the John M. Campbell text books, Gas Conditioning and Processing, are used as the basis for the material presented in this course. A comprehensive course exercise based on a typical gas processing facility which can be applied to either onshore or offshore facilities is used for this course. The problem is developed in stages, as the material is covered, using a commercial simulator package (typically Promax® or UNISIM®). At the completion of the course the participant will have developed a process simulation model that includes a dew point control process, a mechanical refrigeration process with economizers, hydrate inhibition using MEG, and NGL liquid product stabilization with recycle.

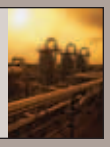
COURSE CONTENT

· Gas processing systems · Physical properties of hydrocarbons · Qualitative phase behavior · Vapor-liquid equilibrium · Water-hydrocarbon equilibrium · Basic thermodynamic concepts · Separation equipment · Heat transfer · Pumps · Compressors · Refrigeration · Fractionation/distillation · Glycol dehydration · Adsorption systems

2013 SCHEDULE AND TUITION

CALGARY
14-18 JAN 2013 ..... US $4,408
HOUSTON
13-17 MAY 2013 ..... US $4,408
DENVER
5-9 AUG 2013 ..... US $4,408
HOUSTON
21-25 OCT 2013 ..... US $4,408
DUBAI
8-12 DEC 2013 ..... US $5,219

Gas Treating and Sulfur Recovery (G-6)



INTERMEDIATE - 5 DAYS

DESIGNED FOR

Production and processing personnel involved with natural gas treating and sulfur recovery requiring an understanding of the principles of these process operations. This course is for facilities engineers, process engineers, operations personnel, field supervisors and others who operate, select, design, install, or evaluate gas sweetening and sulfur recovery facilities.

YOU WILL LEARN

- Evaluation and selection of processes to remove acid gases (H_2S, CO_2, COS, CS_2, mercaptans, etc.) from gas and NGLs
- The advantages and disadvantages of available gas treating technology and processes
- How to estimate solvent circulation rates, energy requirements and equipment sizes
- Recognize and evaluate solutions to common operating and technical problems
- Sulfur recovery technologies, including an overview of the Claus Sulfur process
- How to select among the sulfur recovery process given differing process conditions
- Tail gas clean-up

ABOUT THE COURSE

This course emphasizes process selection, practical operating issues, technical fundamentals, and integration of the sweetening facilities into the overall scheme of gas processing. Sulfur recovery and tail gas processes are also covered including standard Claus configurations, SuperClaus®, EuroClaus®, SCOT® etc. Special design and operation topics such as handling trace sulfur compounds and the importance of H_2S:CO_2 ratio is covered. Related topics such as liquid product treating, corrosion, materials selection and NACE requirements will also be reviewed.

COURSE CONTENT

· Fundamentals of sour gas processing, sweetening etc. · Overview of gas treating and sulfur recovery, terminology · Gas specifications and process selection criteria · Generic and specialty amine treating · Common operating and technical problems · Proprietary amine solvents such as Sulfinol® and Flexsorb® · Carbonate processes · Physical absorption processes, e.g. Selexol · Metallurgical issues – corrosion · Other technologies and new developments · Selective treating, acid gas enrichment · Solid bed and non-regenerable treating; scavengers · Liquid product treating · Sulfur recovery processes · Tail gas clean-up: SCOT-type, CBA and others · Acid gas injection · Emerging and new technologies · Course workshop and summary

2013 SCHEDULE AND TUITION

HOUSTON
11-15 MAR 2013 ..... US $4,174
LONDON
30 SEP - 4 OCT 2013 ..... $US 5,219
ORLANDO
2-6 DEC 2013 ..... US $4,174
DOHA
8-12 DEC 2013 ..... US $4,882

Process Facilities Engineer
Course Progression

Process Facilities separate the well stream into three phases – oil, gas and water – and process these phases into marketable products or dispose of them in an environmentally acceptable manner. Gas handling/processing facilities are a major part of Process Facilities, and are covered in detail as Gas Processing elsewhere in this catalog. Process Facilities, as used here, will mainly include:

- Single-well, satellite & central tank batteries, including:
  - Oil treating - Stabilization
  - Separation equipment
  - Desalting - Storage
- Produced-water treating facilities
- Water injection facilities
- Offshore topsides facilities
- Corrosion management

PROCESS FACILITIES ENGINEER 3-YEAR COURSE PROGRESSION

Below is an example of a 3-year course progression covering topics we believe critical to developing technically strong Process Facilities Engineers.

2 Additonal courses offer further depth in developing competencies.

3 For broader knowledge, these courses are recommended.

- **Instrumentation, Controls & Electrical Systems for Facilities Engineers** (ICE-21) PG 32
- **Process Utility Systems** (PF-47) PG 27
- **Gas Conditioning and Processing** (G-4) PG 18
- **Process Safety Engineering** (PS-4) PG 21
- **Piping Systems: Mechanical Design & Specification** (ME-41) PG 34
- **Relief and Flare Systems** (PF-44) PG 26
- **Corrosion Management in Production/Processing Operations** (PF-22) PG 25
- **Fundamentals of Pump and Compressor Systems in Oil & Gas Facilities** (ME-44) PG 34
- **Onshore Gas Gathering Systems: Design & Operation** (PF-45) PG 27
- **CO_2 Surface Facilities** (PF-81) PG 27
- **Overview of Offshore Systems** (OS-21) PG 29
- **Project Management for Engineering and Construction** (OM-22) PG 38

Oil Production & Processing Facilities (PF-4) PG 23

1 A 3-year progression for a Process Facilities Engineer would begin with the Oil Production & Processing Facilities course (PF-4).

OIL PRODUCTION & PROCESSING FACILITIES (PF-4)

FOUNDATION - 10 DAYS

DESIGNED FOR

Process/facilities engineers, senior operating personnel, and production chemists. Wide-ranging skills for design, operation and troubleshooting of oil and water production equipment.

YOU WILL LEARN

- Well inflow performance and its impact on processing facilities
- About oil, gas, and water compositions and properties needed for equipment selection and sizing
- How to select and evaluate processes and equipment used to meet sales or disposal specifications
- How to apply physical and thermodynamic property correlations and principles to the design and evaluation of oil production and processing facilities
- How to perform equipment sizing calculations for major production facility separation equipment
- How to evaluate processing configurations for different applications
- How to recognize and develop solutions to operating problems in oil/water processing facilities

ABOUT THE COURSE

The emphasis of this course is on oil production facilities – from the wellhead to the delivery of a specification crude oil product to the refinery. Both onshore and offshore facilities will be discussed. Produced-water treating and water injection systems are also covered. Solution gas handling processes and equipment will be discussed as well, though at a relatively high level. In addition to the engineering aspects of oil production facilities, practical operating problems will also be covered including emulsion treatment, sand handling, dealing with wax and asphaltenes, etc. Exercises requiring calculations are utilized throughout the course. The course is intended to be complementary to the G-4 Gas Conditioning and Processing course which is focused on the gas handling side of the upstream oil and gas facilities area.

COURSE CONTENT

- Overview of upstream oil and gas production operations
- Fluid properties and phase behavior
- Overview of artificial lift
- Processing configurations (example PFD's)
- Phase separation of gas, oil, and water
- Emulsions
- Sand, wax, and asphaltenes
- Oil treating
- Field desalting
- Crude stabilization and sweetening
- Crude oil storage and vapor recovery
- Measurement of crude oil
- Transportation of crude oil
- Produced water treating
- Water injection systems
- Overview of solution gas processing
- Compressors
- Relief and flare systems

2013 SCHEDULE AND TUITION

HOUSTON		STAVANGER	
28 JAN - 8 FEB 2013	US $7,848	9-20 SEP 2013	US $8,144
KUALA LUMPUR		ORLANDO	
11-22 MAR 2013	US $8,102	21 OCT - 1 NOV 2013	US $7,848
BAKERSFIELD		BAKERSFIELD	
22 APR - 3 MAY 2013	US $7,848	11-22 NOV 2012	US $7,848
LONDON		DOHA	
10-21 JUN 2013	US $8,144	17-28 NOV 2013	US $8,144
DENVER		HOUSTON	
8-19 JUL 2013	US $7,848	2-13 DEC 2013	US $7,848
CALGARY		DUBAI	
12-23 AUG 2013	US $7,848	8-19 DEC 2013	US $8,144

Oil Production & Processing Facilities (PF-4)
Course Outline

The emphasis of this course is on oil production facilities – from the wellhead to the delivery of a specification crude oil product to the refinery. Both onshore and offshore facilities will be discussed. This course is intended to be complementary to the G-4 Gas Conditioning and Processing course which is focused on the gas handling side of the upstream oil and gas facilities area.

OIL PRODUCTION & PROCESSING FACILITIES (PF-4)

EXAMPLE OF DAY BY DAY COURSE TOPICS

DAY 1
- Course introduction
- Reservoir Traps, Rocks & Drive Mechanisms; Porosity & Permiability, Drive Mechanisms
- Phase Envelopes & Reservoir Fluid Classification; Phase behavior of different reservoirs
- Well Inflow Performance; Inflow performance curve & Effect on facilities
- Artificial Lift: When it is required, Types and selection of artificial lift
- Oil, Gas & Water
  - Composition & Properties
  - Calculation of properties needed for equipment sizing

DAY 2 & 3
- Emulsions; Definition, causes and characterization
- Gas – Liquid Separation
  - Types of equipment used
  - Feed pipe and inlet devices
  - Gas gravity separation section
  - Mist extractors

DAY 4
- Gas – Liquid Separation (cont'd)
  - Liquid handling section
- Oil – Water Separation
  - Types of equipment used, including compact coalescers
  - Residence time & droplet settling theory

DAY 5
- Oil Treating
  - Oil treating methods
  - Heat input requirements
  - Demulsifiers
  - Types of equipment, selection, performance and sizing methods
- Desalting
  - Why desalt? ⟶ crude oil salt specifications
  - Overview of desalting, processes, sizing and selection
- Crude Oil Stabilization & Sweetening
  - Crude oil vapor pressure & H_2S specifications
  - Stabilization and Sweetening processes

DAY 6
- Oil Storage & Vapor Recovery
  - Types of storage tanks & their applications
  - How vapor recovery systems work & where they are used
- Sand, Wax & Asphaltenes
  - Problems caused & typical solutions for surface facilities

DAY 7
- Crude Oil Flow Measurement
  - Types, accuracy and selection of liquid and gas meters
- Fired Equipment
  - Direct & Indirect fired heaters
  - Fire tube and process tube sizing criteria
- Pipeline Transportation of Crude Oil
  - Bernoulli's equation, friction loss and piping codes
  - Line sizing and heat loss calculations

DAY 8
- Pumps
  - Types of pumps & their applications
  - Calculation of head requirements, NPSHA/NPSHR and specific speeds
- Produced Water Treating
  - Produced water composition ⟶ characterization of hydrocarbon content
  - Importance of oil droplet size
  - Typical discharge/disposal specifications
  - Treating equipment options and performance
  - Combination of different equipment types

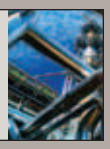
DAY 9
- Water Injection Systems
  - Typical flow diagrams and equipment
  - Source water quality and injection water quality
- Relief & Flare Systems
  - Causes of overpressure
  - Types of relief valves & sizing; Flare system components
  - Radiation calculations
  - Flare gas recovery

DAY 10
- Solution Gas Handling
  - Sales gas specifications, sweetening, dehydration, NGL recovery, etc
- Compressors
  - Types of compressors & applications
- Course Wrap-up

FOR SCHEDULE AND TUITION INFORMATION, SEE PAGE 23 TO THE LEFT.

NOTE: Course schedule is approximate and may be adjusted for location and participant interest. PF-4 is an intensive course and classroom hours are generally longer than a typical training course. Extended evening sessions are sometimes used for additional problems, exercises and syndicate work.

Applied Water Technology in Oil and Gas Production (PF-21)



FOUNDATION - 5 DAYS

DESIGNED FOR
Managers, engineers, chemists, and operators needing to understand water related problems in oil and gas production and their solutions.

YOU WILL LEARN
- The basics of oil field water chemistry
- How to monitor and control corrosion, scale, and bacterial growth in produced water and water injection/disposal systems
- How to implement system surveillance programs to detect potential problems before system damage occurs
- Produced (oily) water treatment options and related treatment equipment
- How to use the knowledge gained to identify typical system problems and be able to propose solutions

ABOUT THE COURSE
This course provides an overview of the main water handling systems typically encountered in upstream (E&P) production operations, both onshore and offshore. The chemistry of the main water related problems of mineral scales, corrosion, bacteria, and oily water will be reviewed both from the theoretical and practical aspects. Produced water treatment equipment and typical water quality specifications will be reviewed as well as water injection and disposal systems. An exercise will be given to identify typical system problems and attendees will be able to apply the knowledge gained to propose solutions. Emphasis will be placed on understanding and resolving operational problems in process equipment.

COURSE CONTENT
- Water chemistry fundamentals
- Water sampling and analysis
- Water-formed scales
- Corrosion control
- Water treatment microbiology
- Produced water discharge/disposal and treatment principles
- Produced water treating equipment – theory of operation, advantages and disadvantages, and the importance of oil droplet size
- Water injection and disposal systems – theory of operation, corrosion, scale, and biological control
- Case study

2013 SCHEDULE AND TUITION

LONDON
18-22 MAR 2013 ..... US $4,774

HOUSTON
12-16 AUG 2013 ..... US $3,846

ORLANDO
11-15 NOV 2013 ..... US $3,846

Corrosion Management in Production/Processing Operations (PF-22)

FOUNDATION - 5 DAYS

DESIGNED FOR
Managers, engineers, chemists, and operators needing to understand corrosion and its control management in oil and gas production and processing.

YOU WILL LEARN
- The basics of corrosion chemistry
- The main corrosion mechanisms occurring in oil and gas production/processing systems
- The different types of damage caused by corrosion
- Materials selection for corrosion prevention
- Some methods for conducting cathodic protection (CP) surveys
- Items to consider in corrosion inhibitor selection
- Key advantages and disadvantages of the various corrosion monitoring methods
- Where the main locations of corrosion concern occur within oil production systems, gas processing facilities (including amine units), and water injection systems

ABOUT THE COURSE
This course will cover the main causes of corrosion in upstream oil and gas operations, as well as monitoring and mitigation methods. The various corrosion mechanisms give rise to a number of different forms of corrosion damage which will all be considered. Participants will estimate the corrosivity of a given environment through analysis of the chemical and physical characteristics of the system. You will review approaches to selecting materials and coatings for corrosion resistance for different conditions and applications, including the use of NACE MR0175. You will be introduced to CP surveys, selecting the CP system type, estimating current requirements and the design principles of simple cathodic protection systems. There is an opportunity to review some of the selection criteria used to find the optimum corrosion inhibitor for different systems. The course content is based on a field facilities engineering point of view as opposed to a more narrowly specialized corrosion engineering or chemistry viewpoint. This course provides an appropriate balance of necessary theory and practical applications to solve/mitigate corrosion related problems.

COURSE CONTENT
- Fundamentals of corrosion theory
- Major causes of corrosion (O_2, CO_2, H_2S, microbiologically influenced corrosion)
- Forms of corrosion damage
- Materials selection
- Protective coatings & linings
- Cathodic protection
- Corrosion inhibitors
- Corrosion monitoring and inspection
- Corrosion in gas processing facilities
- Corrosion in water injection systems
- Corrosion management strategy and life-cycle costs

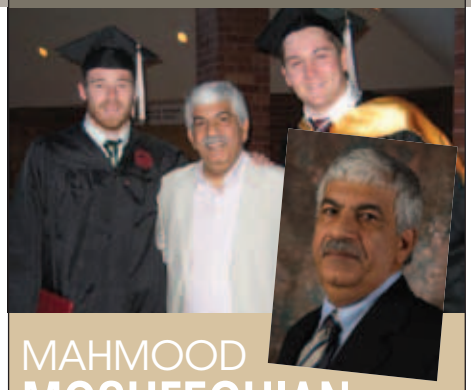
2013 SCHEDULE AND TUITION

HOUSTON
19-23 AUG 2013 ..... US $2,048

ORLANDO
18-22 NOV 2013 ..... US $2,048

JOHN M. CAMPBELL & CO.

INSTRUCTOR SPOTLIGHT



MAHMOOD MOSHFEGHIAN

What courses do you teach?
G-4, G-40, G-2, PF-4, PF-42, and the Online GCAP Course for JMC Instructors.

Do you have a favorite city to visit?
I like most cities I've visited. My favorite cities are Shiraz where I was born and worked, and Bushehr where I grew up and went to school. I've enjoyed Florence in Italy, Perth and Sydney in Australia as well. The weather is pleasant and I still have a few friends with whom I enjoy visiting.

A favorite food from one of the cities in which you teach?
I enjoy spicy foods so Cajun cuisine and fresh seafood are my favorites.

Do you have a favorite hobby you enjoy?
I used to do a lot of carpentry which I still enjoy when I get a chance. I like to watch and play soccer, though it's getting harder to chase the ball as fast as I used to.

Do you have a short story to share from a session?
On my recent flight from Amsterdam to Almaty in Kazakhstan, I introduced myself to the man sitting next me, who was travelling with his wife and baby boy. He also introduced himself and said I know you! I was embarrassed that I didn't remember who he was and asked if he had attended one of my courses.

I normally have a hard time remembering the names of some past participants, since I've taught so many courses in university and industry. He said you are the JMC instructor who writes Tips of the Month. He went on to tell me that he is a senior process engineer on his way back to Kazakhstan after two years of assignment in Wyoming, USA. He mentioned that he has enjoyed reading the Tips and found them helpful at work.

Separation Equipment - Selection & Sizing (PF-42)

INTERMEDIATE - 5 DAYS

DESIGNED FOR
Process/Facilities engineers needing skills for design and trouble-shooting of separators.

YOU WILL LEARN
- Different types of separation equipment utilized in the oil and gas industry and where they are used
- Separation performance capabilities of the different types of equipment
- How to size the different types of separation equipment
- How to troubleshoot and debottleneck separation equipment
- How to calculate the wall thickness and estimate the weight of separators
- Instrumentation and controls used on separation equipment

ABOUT THE COURSE
This course covers the different types of separation equipment typically encountered in oil & gas process facilities. Fractionation equipment and produced water treating equipment are not covered in this course. You will learn where the different types of separation equipment are used based on operating conditions and separation performance requirements. Frequent references will be made to real production facility process flow diagrams (PFD's). Typical operational problems and their solutions will be discussed. Exercises requiring calculations are utilized throughout the course.

COURSE CONTENT
- Fluid properties & phase behavior
- Phase separation processes
- Gas–liquid separation equipment
  - Slug catchers
  - Conventional separators (horizontal & vertical)
  - Scrubbers
  - Compact separators
  - Filter separators/coalescing filters
- Separator internals
  - Inlet devices
  - Mist extractors
  - Baffles, weirs, etc
- Emulsions
- Oil–water separation equipment
  - Conventional 3–phase separators & freewater knockouts
  - Wash tanks
- Oil treating & desalting equipment
  - Mainly electrostatic coalescers
- Liquid-liquid coalescing filters
- Mechanical design aspects
  - Pressure vessel codes
  - Wall thickness & vessel weight estimation
  - Material selection
  - Relief requirements
- Operational problems

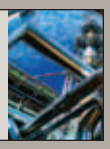
Participants, please be aware that due to overlap in content, it is not necessary to take the PF-42 course if you have already taken the PF-4 Oil Production and Processing Facilities course.

2013 SCHEDULE AND TUITION

HOUSTON
4-8 FEB 2013 . . . . . US $3,846

ORLANDO
14-18 OCT 2013 . . . . . US $3,846

Heat Transfer Equipment (PF-43)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Engineers and senior operating personnel involved in the design, specification, or operation of heat transfer equipment.

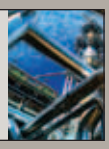
YOU WILL LEARN
- Select the correct heat transfer equipment for a particular application with reference to typical facility process flow diagrams (PFD's)
- Apply heat transfer principles to design and specify heat transfer equipment
- Evaluate the performance of heat transfer equipment and recommend solutions to problems
- About the typical instrumentation and control schemes used by the various types of heat transfer equipment

ABOUT THE COURSE
This course reviews the selection, basic design, and operation of heat transfer equipment commonly used in the oil and gas industry with focus on E&P process facilities. Heat transfer equipment discussed will include shell and tube exchangers, compact heat exchangers, brazed aluminum exchangers, air coolers, and fired equipment (fire-tube and direct-fired).

COURSE CONTENT
- Typical process heating & cooling applications
- Fluid properties
- Heat transfer principles
- Shell and tube exchangers
- Compact heat exchangers
  - Plate-frame
  - Printed circuit
  - Welded plate
- Brazed aluminum exchangers
- Air coolers
- Fired equipment (furnace type & fire-tube)
- Operating problems
- Typical instrumentation control schemes

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Relief and Flare Systems (PF-44)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Engineers & senior operating personnel responsible for designing, operating and maintaining relief and flare systems in oil and gas facilities.

YOU WILL LEARN
· Purposes of relief and flare systems and their importance in safe operations · Causes of overpressure and the ways to control/mitigate · Relief case scenarios and relief load determination · How to select and size pressure relief devices · Relief device installation, including sizing their associated inlet and outlet lines · Set/relieving pressures to meet operational, safety and code requirements · Relief and flare system design and operating considerations, including fluid characteristics, service conditions, volumes, gas dispersion and radiation · Sizing and selection of relief/flare system components such as flare knockout drums, flare stacks and tips, pilot and ignition systems

ABOUT THE COURSE
This is an intensive 5-day course providing a comprehensive overview of relief and flare systems for oil and gas processing facilities. The course begins with the need for pressure control/overpressure protection, continues with the key engineering and design aspects including code considerations, and concludes with selecting and defining the components of a relief and flare system. The material of the course is applicable to onshore field production facilities, pipelines, gas plants, terminals, and offshore production facilities.

COURSE CONTENT
· Purposes and overview of typical relief and flare systems and key components · Safety implications and the causes of overpressure · Codes, standards and recommended practices used for overpressure protection design and operation in oil and gas facilities · Overpressure protection methods including pressure source isolation using high integrity protection systems (HIPS) · Introduction to Process Hazard Analysis · Determination of relief requirements and defining setpoint pressures · Types and applications of common relief devices · Blowdown/depressurizing – purpose & design/operational considerations · Design and specification considerations for relief valves and header systems including fluid characteristics, services conditions, material selection, and header sizing · Radiation calculations and the impact of flare tip design · Selection and sizing of key components such as knockout and seal drums, vent/flare stack, vent/flare tips and flare ignition systems · Defining need and quantity of purge gas · Use of environmental friendly strategies such as flare gas recovery, smokeless flaring and purge gas conservation · Operational and troubleshooting tips

2013 SCHEDULE AND TUITION

HOUSTON
18-22 MAR 2013 . . . . . US $3,846

ABERDEEN
3-7 JUN 2013 . . . . . US $4,774

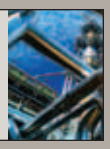
PERTH
19-23 AUG 2013 . . . . . US $4,770

HOUSTON
30 SEP - 4 OCT 2013 . . . . . US $3,846

KUALA LUMPUR
21-25 OCT 2013 . . . . . US $4,856

DUBAI
8-12 DEC 2013 . . . . . US $4,904

Onshore Gas Gathering Systems: Design & Operation (PF-45)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Production & facilities department engineers/senior operating personnel responsible for the design, operation and optimization of onshore gas gathering systems and their associated field facilities.

YOU WILL LEARN
- The impact of gathering system pressure on gas well deliverability
- The impact of produced fluids composition on gathering system design & operation
- Evaluate field facility & gathering system configurations for different applications
- Recognize and develop solutions to operating problems with existing gas gathering systems

ABOUT THE COURSE
This course deals with the design, operation and optimization of onshore gas gathering systems and their associated field facilities, from the wellhead to the central gas processing facility. From a design perspective, the main variables that impact the flexibility and operational characteristics of an onshore gas gathering system will be discussed. Typical operating problems are covered including hydrates, multiphase flow issues, corrosion, declining well deliverability, etc. Exercises will be utilized throughout the course to emphasize the key learning points.

COURSE CONTENT
- Gas well inflow performance & deliverability
- Overview of gas well deliquification methods for low-rate, low pressure gas wells
- Effect of gathering system/abandonment pressure on reserves recovery
- Impact of produced fluids composition
- Sweet/sour
- CO_2 content
- Rich/lean
- Produced water
- Hydrates and hydrate prevention
- Dehydration
- Heating
- Chemical inhibition
- Multiphase flow basics
- Corrosion/materials selection
- Gathering system layout
- Wellsite/field facilities options
- Provisions for future compression

2013 SCHEDULE AND TUITION

DENVER
15-19 JUL 2013 . . . . . US $3,846

HOUSTON
28 OCT - 1 NOV 2013 . . . . . US $3,846

Process Utility Systems (PF-47)

FOUNDATION - 5 DAYS

DESIGNED FOR
Facility Engineers or engineers new to utility systems who are responsible for designing, operating and maintaining utility systems in oil and gas processing and related facilities. Most operations and planning activities depend on a fundamental knowledge of utility systems. This important subject is frequently overlooked however it is vital to successful oil and gas operations. Attending this course will assist participants in developing a broad background in utility systems.

YOU WILL LEARN
- To list the various options in selecting utility systems
- How to evaluate and select systems based on key criteria and considerations
- Key site selection considerations
- How to efficiently provide utilities
- Utilities management issues

ABOUT THE COURSE
This 5 day course will provide an overview of the various Utility Systems, key selection considerations and how they are integrated into onshore and offshore oil and gas facilities. Individuals will develop a basic understanding of the wide variety of utility systems and components and how they integrate with the process facilities and overall operation. System selection, relative costs and other managerial decisions pertinent to utility operations are covered. Exercises are used to identify utility consumers, summarize utility requirements, consider high level utility systems options, and select the most energy efficient alternatives from an onshore and offshore perspective.

COURSE CONTENT
- Process heating systems
  - Steam
  - Hot oil
  - Glycol and water
- Process cooling systems
  - Indirect- cooling water
  - Direct-seawater
- Process drains – open and closed
- Refrigeration
- Power generation and distribution
- Instrument/Plant air and breathing air
- Fresh & potable water
- Fuel systems
  - Natural gas
  - Diesel
- Firewater
- Inert gas systems
- Utilities energy considerations
- Utilities management issues

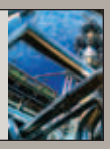
2013 SCHEDULE AND TUITION

HOUSTON
13-17 MAY 2013 . . . . . US $3,846

ABERDEEN
10-14 JUN 2013 . . . . . US $4,774

ORLANDO
9-13 DEC 2013 . . . . . US $3,846

CO_2 Surface Facilities (PF-81)



SPECIALIZED - 3 DAYS

DESIGNED FOR
Engineers and senior operating personnel involved with carbon dioxide (CO_2) Enhanced Oil Recovery (EOR) systems.

YOU WILL LEARN
- ·What to expect over the life of a CO_2 EOR system
- The impact of CO_2 on the design and operation of oilfield equipment
- The physical and thermodynamic properties of pure CO_2 and the impact of CO_2 as a component in hydrocarbon mixtures
- Unique characteristics of dehydrating CO_2 and CO_2–rich gases
- Best practices to deal with dense phase in pipelines, meters, flare and blowdown systems etc.
- How to compress and/or pump CO_2
- The basics of ductile fracture arrest
- The challenges of separations involving high CO_2 concentrations and the basics of specialized processes such as membranes, bulk and/or extractive distillation, and hybrid systems.

ABOUT THE COURSE
This course emphasizes the affect of carbon dioxide on the selection and operation of equipment (separators, compressors, and dehydrators), as well as sweetening process equipment. This program, first introduced in 1985, assists those working with carbon dioxide or high carbon dioxide content natural gas. This course is particularly applicable to those persons who are familiar with conventional facilities but need to understand the significance of high CO_2 concentrations. Physical and thermodynamic properties for carbon dioxide/natural gas mixtures are described and best practices are discussed. Tools are introduced and used which allow participants to predict the behavior and assess the impact of CO_2 on facilities.

The standard course has a heavy emphasis on CO_2 for enhanced oil recovery. Variations of the course have been delivered which focus on acid gas injection or CO_2 storage facilities - both of which have much in common with CO_2 injection for EOR. Numerous specialized sessions have also been conducted to prepare operations and maintenance personnel for high-CO_2 environments.

An extra day will be added to the Midland course if a plant tour is available. The plant tour is optional.

COURSE CONTENT
- Overview of CO_2 injection and process facilities with an emphasis on CO_2 EOR
- Physical and thermodynamic properties of CO_2 and high CO_2 mixtures
- Materials selection and design consideration in CO_2 systems
- Process vessel specification
- Pumps and compressors
- Fluid flow and special pipeline design considerations such as the control of Ductile Fractures
- Dehydration of CO_2 and CO_2-rich gases
- General overview of processes to treat/recover CO_2

2013 SCHEDULE AND TUITION

CALGARY
11-13 MAR 2013 . . . . . US $2,772

MIDLAND
18-21 NOV 2013 . . . . . US $2,772

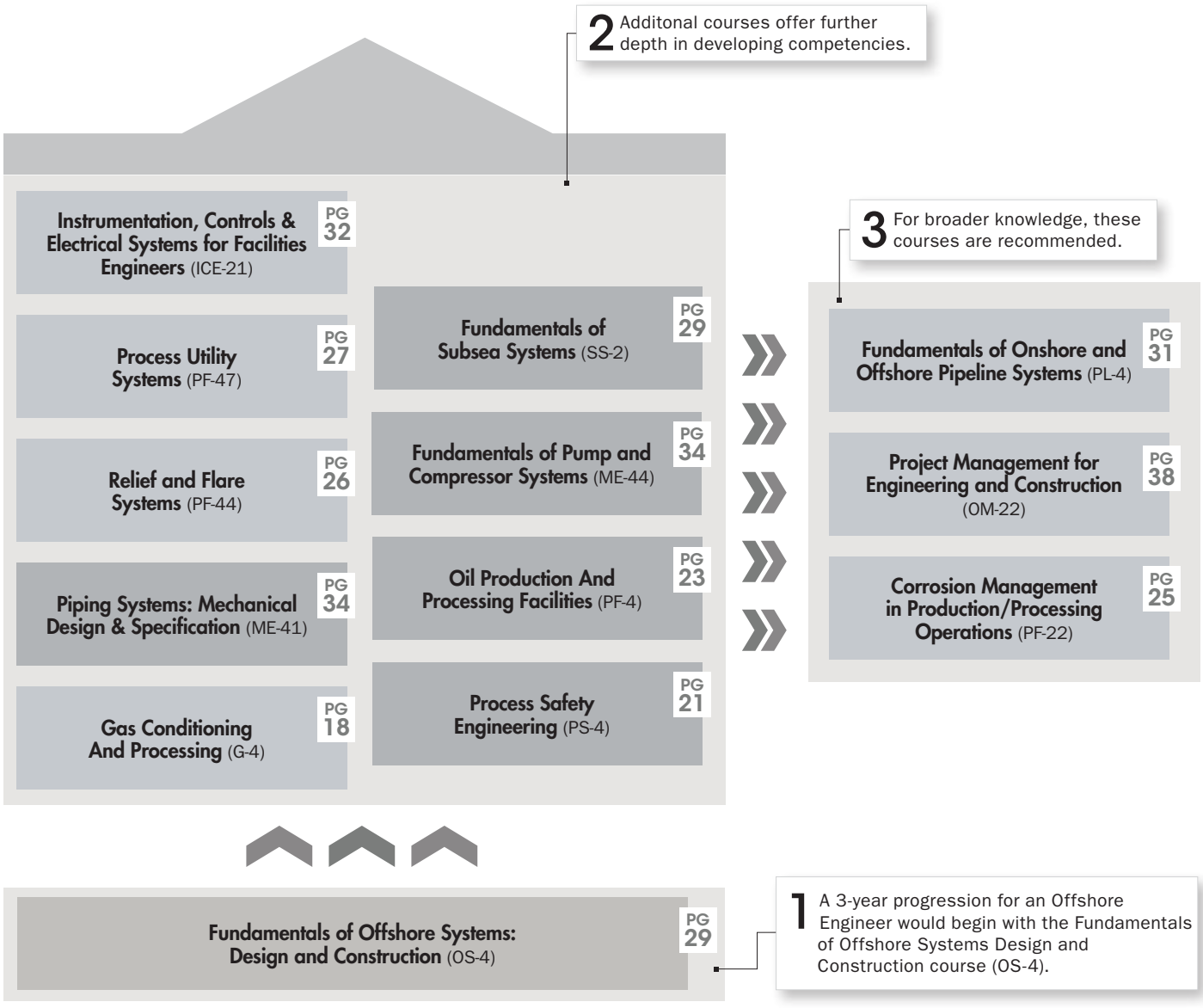
Offshore Engineer Course Progression

Campbell Training's Offshore Team provides technical training and consulting for the complete life-cycle of offshore oil and gas systems; from exploration and development to decommissioning. The curriculum includes courses that provide attendees the knowledge to understand and participate in evaluating the major offshore development alternatives: fixed structures, floating systems and subsea systems. Other key elements stressed in all offshore courses include life-cycle costs, constructability, operability and interface management.

Offshore instructors have extensive real world experience managing offshore development projects, well construction and servicing, asset management and producing operations. Their broad knowledge blends the unique technical and operational issues of offshore into an integrated approach to enhance understanding of the full scope of offshore facilities.

OFFSHORE ENGINEER 3 YEAR COURSE PROGRESSION

Below is an example of a 3 year course progression covering topics we believe critical to developing technically strong Offshore Engineers.



Fundamentals of Offshore Systems: Design & Construction (OS-4)

FOUNDATION - 10 DAYS

DESIGNED FOR

Individuals with a basic awareness of, or experience in, offshore engineering and operations. Technical staff, project engineers, engineering discipline leads, engineering specialists and operating staff find this course accelerates their ability to contribute on offshore field development planning, design and construction projects and field operations.

YOU WILL LEARN

· Identify the key facilities parameters that must be evaluated for field development · Describe the types and capabilities of offshore well construction, pipeline, riser and production (surface and subsea) facilities needed for all water depths, from shallow to ultra deepwater · Recognize the best applications and characteristics of each type of offshore fixed and floating structure · Account for the affects of the ocean environment on facilities design, construction and operations · Identify the impact space, loads and forces have on the structural design and global performance of offshore structures and how they influence their cost · Describe how topside facilities (drilling, well servicing, processing and utilities) affect the structural design and how the topside design process is done · Recognize and manage key design and operational interfaces between the major components of offshore facilities systems · Understand and apply the key design, construction and installation issues associated with fixed and floating platforms to your work

ABOUT THE COURSE

The 10-day course provides a fundamental understanding of the technology and work processes used for the design and construction of all types of offshore systems asset development, surveillance and management. The content includes the full range of water depths from shallow water to ultra deepwater and will also address life-cycle considerations in all phases of offshore field development and operation. All major components required for offshore developments such as fixed and floating platforms, drilling rigs, workover equipment, pipelines, risers, process and utilities and construction equipment are discussed. Emphasis is placed on the multi-discipline team approach needed to manage the myriad interfaces of offshore facility design, construction and operations. Individual and group exercises are used throughout the course. A "red thread" project exercise is included to develop field architecture recommendations, basic design and high level project execution plans for an offshore development. The course instructors are experienced offshore managers.

COURSE CONTENT

· Offshore systems overview and field architecture selection · Well construction and servicing equipment and operations · Flow assurance · Topside facilities · Oil and gas transportation facilities · Riser systems · Subsea systems · Production operations · Infrastructure impact on design and operations · Effects of the ocean environment · Introduction to naval architecture · Structural design processes and tools · Construction plans and execution · Project management lessons learned · Life-cycle and decommissioning considerations

2013 SCHEDULE AND TUITION

HOUSTON
8-19 APR 2013 ..... US $6,858
LAGOS, NIGERIA
17-28 JUN 2013 ..... US $7,649
SINGAPORE
2-13 SEP 2013 ..... US $7,344
LONDON
30 SEP - 11 OCT 2013 ..... US $7,649

Overview of Offshore Systems (OS-21)

BASIC - 5 DAYS

DESIGNED FOR

Technical staff, business professionals, technicians, analysts and other non-technical staff that are involved but have limited experience, or will be involved, with offshore oil and gas facilities. The course provides a basic understanding of offshore systems in all water depths, from shallow to ultra deepwater, including design, construction and operations.

YOU WILL LEARN

· Identify the key steps in the development of offshore fields from discovery through decommissioning · Understand the elements of field architecture to define an optimum field development · Recognize key technical and non-technical stakeholder issues · Recognize the types and terminology of offshore process facilities and structures - fixed and floating. · Understand the impact of the ocean environment on facilities design and operations · Identify major design, construction, and operational issues and interfaces of offshore systems · Recognize important forces on offshore structures and their influence on design and cost · Understand strategic options for well drilling (construction) and servicing · Appreciate the basic processes and equipment involved in the topsides design and operation · Understand the options and equipment used for transportation of produced fluids and treatment chemicals · Develop an appreciation for the marine equipment used in the construction of offshore facilities. · Understand basic issues in life-cycle and decommissioning decisions · Appreciate the continuing advances being made in the technology of offshore

ABOUT THE COURSE

This five-day course will accelerate the learning and productivity of individuals with little to no experience working in the offshore oil and gas industry. The course provides an overview of field development concepts and explains how offshore structures and facilities function as integrated systems. The content includes the full range of water depths from shallow water to ultra deepwater. All major components required for offshore developments such as fixed and floating platforms, drilling and workover rigs, pipelines, risers, process and utilities and construction equipment are discussed. The importance of life-cycle considerations during development planning is emphasized. Individual and group "red thread" exercises are used throughout the course. The course instructors are experienced offshore managers.

COURSE CONTENT

· Field development concepts: - Ocean environment and its impact on offshore systems - Fixed and floating structures - options and applications · Subsea Systems · Drilling wells, their construction and servicing operations · Topsides Facilities: - Processing - Utilities · Oil and gas transportation system design and installation · Production operations · Offshore Construction - Equipment - Fabrication, Transportation, Integration, Installation · Project Management · Life-cycle considerations including decommissioning

2013 SCHEDULE AND TUITION

LONDON
8-12 APR 2013 ..... US $4,774
HOUSTON
22-26 JUL 2013 ..... US $3,846
HOUSTON
9-13 SEP 2013 ..... US $3,846
ORLANDO
2-6 DEC 2013 ..... US $3,846

Fundamentals of Subsea Systems (SS-2)

FOUNDATION - 5 DAYS

DESIGNED FOR

Technical staff that are beginning or transitioning into the design, construction, and operation of subsea systems. Non-technical staff working with a subsea development team will benefit by developing an awareness of subsea systems.

YOU WILL LEARN

- Recognize the integrated nature of field architecture, system design, and component selection
- Identify appropriate applications for subsea systems
- Identify the main subsea components, their functions, strengths, weaknesses and interfaces from the well to the production facility
- Understand key design, construction, and installation issues
- Describe basic operating and maintenance considerations
- Understand the key steps from drilling through startup for the design, fabrication, testing, installation and operation
- Understand the importance of an integrated approach to design, flow assurance, installation, and life-cycle considerations

ABOUT THE COURSE

An overview of subsea components and how they are integrated into field architecture is provided during this 5-day course. Individuals will develop a basic understanding of the various subsea components used in all water depths, from relatively shallow to ultra deepwater. The participants will all learn how the components are integrated into subsea field developments which will accelerate learning and productivity. Installation and working underwater are emphasized as key drivers in subsea design. The course emphasizes a systems approach to design. Individual and group exercises are used throughout the course including a "red thread" exercise to develop field architecture recommendations, basic component selection, and high level project execution plans for a subsea development. Course instructors are experienced offshore managers.

COURSE CONTENT

- Applications for subsea systems
- Flow assurance considerations in system design and configuration
- Field architecture considerations
- Subsea component descriptions and functions
- Fabrication, testing, installation, commissioning, and operational issues
- Production, maintenance, and repair considerations

2013 SCHEDULE AND TUITION

HOUSTON
22-26 APR 2013 ..... US $3,846
LONDON
3-7 JUN 2013 ..... US $4,774
SINGAPORE
12-16 AUG 2013 ..... US $4,856
ORLANDO
23-27 SEP 2013 ..... US $3,846

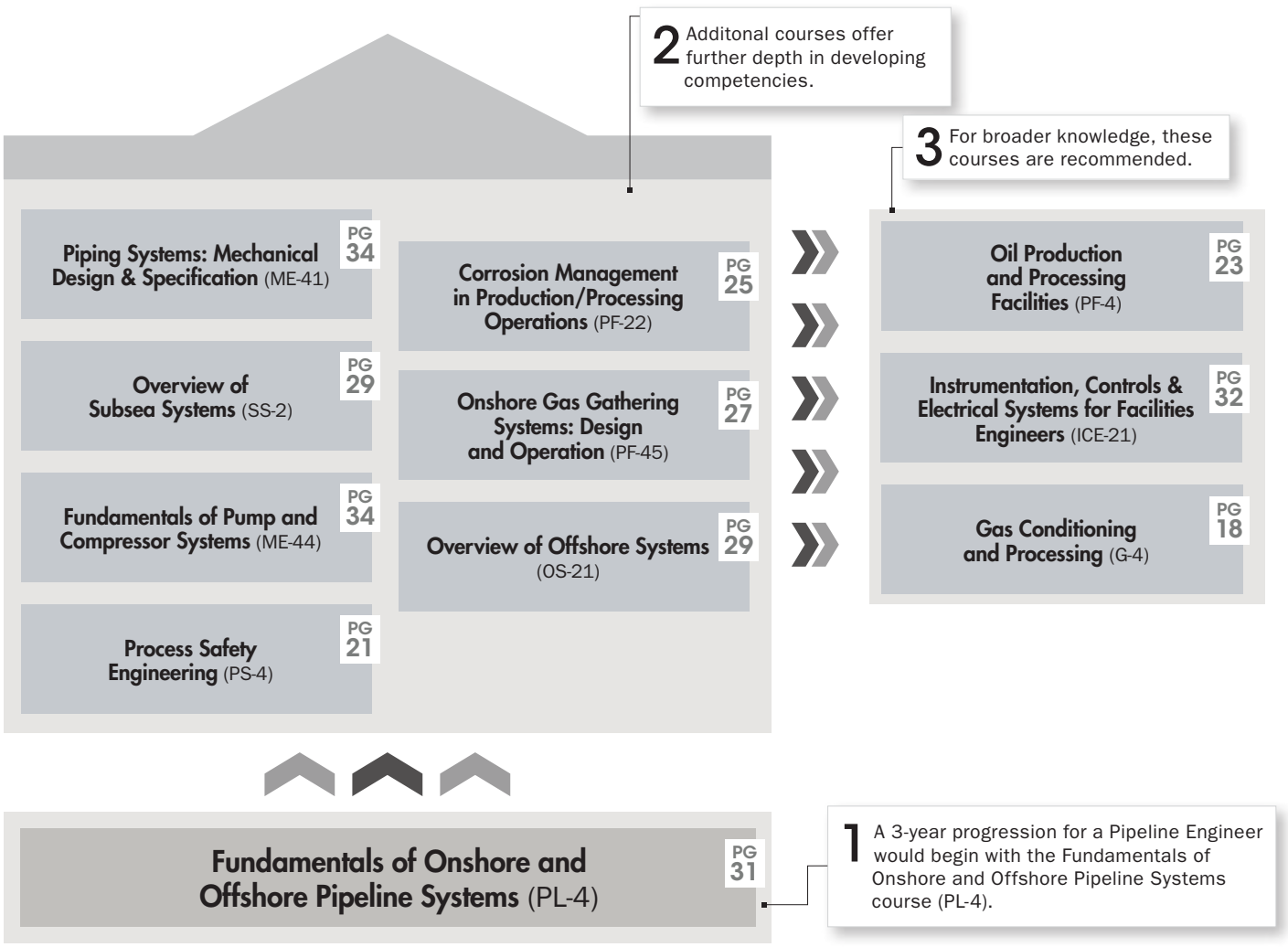
Pipeline Engineer Course Progression

Campbell Training's Pipeline Progression provides technical training and consulting for oil and gas transportation, focusing on pipeline systems as well as onshore infrastructure systems that support oil and gas operations. The curriculum covers pipeline transportation systems, oil and gas terminal facilities, and the onshore infrastructure from regional considerations through design and construction of site-specific systems. As with all our training programs, these discipline areas integrate with the other technical, operations and HSE disciplines.

The Campbell Instructors and Consultants that support the Pipeline discipline have extensive real world – global experience from conceptual development through operations. Their broad knowledge blends the unique technical and operational issues of pipeline systems that transport all types of fluids – from heavy oils to refined products to high pressure injection gas and water - into integrated systems. This global experience spans the pipeline industry from initial site selection through detailed design and construction of unique facilities.

PIPELINE ENGINEER COURSE PROGRESSION

Example of recommended courses to develop a Pipeline Engineer over a 3-year span.



Fundamentals of Onshore and Offshore Pipeline Systems (PL-4)

FOUNDATION - 10 DAYS

DESIGNED FOR

Technical professionals new to the pipeline business or needing a broad understanding of the pipeline business including: pipeline project managers, pipeline engineers, facilities engineers, pipeline design and construction engineers, engineering and construction contractors.

YOU WILL LEARN

- How to apply mechanical and physical principles to all phases of pipeline design, construction, and operation
- Identify similarities and differences of onshore and offshore pipeline systems
- Incorporate construction methods, commissioning, pressure testing, and start-up into the design of a pipeline system
- Applying safety and environmental regulations for a sound design
- Common sense methods and technical requirements to define pipeline routes and facilities locations
- The importance of fluid properties and process to pipeline systems design and construction

ABOUT THE COURSE

This intensive, ten-day foundation level course covers the design, construction, and operation of pipeline systems. The focus is on pipeline routing, hydraulics, mechanical design, and construction for both onshore and offshore pipelines. The result of this course is cost-effective, safe and environmentally sound design, construction, inspection, operation, and maintenance of pipelines. Design problems and group projects are an integral part of this course.

COURSE CONTENT

- Pipeline systems definition and applications
- Codes and standards related to pipelines
- Pipeline hydraulics: single-phase gas and liquids, multiphase fluids and heavy/waxy crudes
- Major design considerations for strength, stability, and installation
- Pipeline survey and mapping
- Pipeline route engineering
- Pipeline materials and components
- Corrosion and cathodic protection of pipelines
- Special design aspects, covering such issues as risers, slug catchers, pigging facilities, etc
- Basic design considerations for pipeline facilities
- Pipeline construction for cross country and offshore systems focusing on welding
- Pressure testing, pre-commissioning, and commissioning
- Pipeline integrity aspects including in-line inspection
- Leak detection and emergency planning considerations
- Repairs and modification considerations
- Safety, environmental, and regulatory requirements

2013 SCHEDULE AND TUITION

KUALA LUMPUR
18-29 NOV 2013 ..... US $7,344

Onshore Pipeline Facilities: Design, Construction and Operations (PL-42)

FOUNDATION - 5 DAYS

DESIGNED FOR

Technical professionals new to the onshore pipeline business or needing a broad understanding of the design and construction of onshore pipeline business including: pipeline project managers, pipeline engineers, facilities engineers, pipeline design and construction engineers, engineering and construction contractors.

YOU WILL LEARN

- How to apply mechanical and physical principles to pipeline design, material selection, construction, and operation
- Identify special design and construction challenges of onshore pipeline systems
- Identify the principal interfaces and potential interrelationships of pipeline facilities such as: pump stations and terminals on design and operations of onshore pipeline systems
- Safety and environmental practices and their affect on design, construction, and operation

ABOUT THE COURSE

This intensive, five-day foundation level course covers the design, construction, and operation of onshore pipeline systems. This course will incorporate construction methods, commissioning, pressure testing, and start-up into the design of a pipeline system. The course focuses on pipeline routing, mechanical design, construction methods, hydraulics, installation, and operation of onshore pipeline systems. Participants will acquire and/or consolidate the essential knowledge and skills to design, construct, and operate pipelines. Design problems are an integral part of this course.

COURSE CONTENT

- Pipeline systems definition and applications
- Safety, environmental, and regulatory considerations; codes and standards related to pipelines
- Pipeline conceptual and mechanical design for strength, stability, and installation
- Impacts of pipeline hydraulics on pipeline design, construction, and operations
- Pipeline survey, mapping, and route selection
- Pipeline materials and components
- Corrosion and cathodic protection of pipelines
- Pipeline construction for onshore systems
- Introduction to flow assurance considerations and pipeline integrity aspects including in-line inspection, leak detection, and emergency planning considerations
- Pipeline operations, maintenance and repairs considerations

2013 SCHEDULE AND TUITION

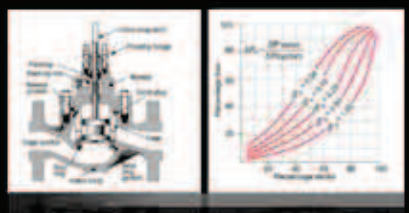
HOUSTON
15-19 APR 2013 ..... US $3,846

DENVER
29 JUL - 2 AUG 2013 ..... US $3,846

DUBAI
6-10 OCT 2013 ..... US $4,882

ORLANDO
11-15 NOV 2013 ..... US $3,846

Build Your Knowledge & Skills In PLC, SCADA, Valves & Actuator Technologies



ANNOUNCING TWO NEW COURSES:

PLC and SCADA Technologies (IC-71)

This workshop provides engineers and technicians with the basic theoretical and practical understanding of PLC and SCADA systems. It traces the evolution of the PLC as an intelligent 'black box' replacement for the relay panel and how, with the advent of modern communications architectures, it is combined with supervisory control systems to allow stand-alone control systems to be configured.

Valve and Actuator Technologies (IC-72)

A methodology is presented to ensure the optimum selection of size, choice of body and trim materials, components, and ancillaries. While studying both liquid and gas valve sizing, delegates will also learn the correct procedures for calculating the spring 'wind-up' or 'bench set'. Maintenance issues also include: testing for dead-band/hysteresis, stick-slip and non-linearity; on-line diagnostics; and signature analysis.

For course descriptions, see page 33
To enroll, go to **jmcampbell.com/ice**

Instrumentation, Controls and Electrical Systems for Facilities Engineers (ICE-21)

FOUNDATION - 5 DAYS

DESIGNED FOR
Managers, engineers, technicians and system operators requiring a broad understanding of instrumentation, control, and electrical systems in oil and gas facilities.

YOU WILL LEARN
Electrical Power
- Defining fundamentals parameters for electrical power usage and generation such as voltage levels, self-generate versus purchased power, and basic electrical power management.
- Developing electrical power demand (load) lists, one-line diagrams, and the selecting and integration of power distribution systems.
- Identifying electrical power users (for the load list) then evaluating the equipment demand on the power system (such as intermittent or continuous service, and motor starting loads).
- Using safe practices such as hazardous area definition and circuit protection.

Instrumentation and Control
- Defining what to measure, why to measure a parameter, and how to measure.
- Determining and using the many control strategies, equipment and computer systems common to an oil and gas facility.
- Identifying equipment and instrument characteristics and using appropriate instrumentation and controls.
- Defining and integrating components into systems that monitor and locally control the process (and related equipment), safety systems, and the communications and remote control systems used.

ABOUT THE COURSE
This 5-day course provides an overview of electrical power generation and distribution, process and safety systems instrumentation, and control strategies and configurations. The focus is on application and integration into the process and control of upstream and midstream oil and gas facilities. The material of the course is applicable to field process facilities, pipelines, gas plants, and offshore systems.

COURSE CONTENT
· Key electrical power considerations and fundamentals applied in oil and gas facilities. · Voltage levels and power type (3-phase, single-phase, and direct current) selection and application. · Purchased power considerations including generation efficiency, redundant sources, transmission grid parameters, and cost considerations. · Electric power distribution, systems loads, internal grid layout, major distribution equipment and cabling. · Power users definition and integration into the power distribution system. · Electrical system safety. · Process systems operations and the key characteristics, and measurement needs, as well as techniques to measure and control. · Control modes and their applications, communications requirements, and the operator and computer controller interface. · Interrelationships between process, equipment, instruments and controls. · Field (facility) control and monitoring systems such as pressure and level indicators and controllers. · Field (facility) safety monitoring and response systems including SIS, HIPPS and emergency shutdown valves. · System-wide considerations including communications, local control, remote control, and data management and use.

2013 SCHEDULE AND TUITION

BAKERSFIELD
18-22 MAR 2013 ..... US $3,846

DOHA
21-25 APR 2013 ..... US $4,770

LONDON
17-21 JUN 2013 ..... US $4,774

HOUSTON
23-27 SEP 2013 ..... US $3,846

Electrical Engineering Fundamentals for Facilities Engineers (E-3)

FOUNDATION - 5 DAYS

DESIGNED FOR
Facilities and Project Engineers as well as new Instrumentation, Controls and Electrical Engineers who need to improve their basic understanding of electrical systems within oil and gas facilities.

YOU WILL LEARN
- The key components of facilities electric power distribution which include circuit arrangements, low and medium voltage switchgear, and single-phase and three phase schemes
- Operation, components, electromotive forces, turns and voltage ratios, losses, efficiency, rating, and connections of transformers
- The difference between direct current motors, alternating current motors, enclosures and how to select motors
- Protection of electrical equipment including fuses, direct tripping, relaying, and coordination
- About emergency power to include power requirements, generator sets, direct current systems, batteries, and an overview of uninterruptible power supplies (UPS)
- Power generation which includes an overview of emergency, prime, base, peak and co-generation, quality, sizing, operation, control, and power factor correction
- Grounding and bonding with an overview of systems, equipment, ignition sources, separately derived systems, performance, and substation grounding
- Hazardous areas with general information on classifications, NEC, IEC, equipment protection, certification, and definitions

ABOUT THE COURSE
This course applies fundamental electrical engineering principles to oil and gas facilities design and operation. The course is designed for Facilities Engineers with or without a background in electrical engineering and can accelerate the development of new Facilities Electrical Engineers. Through the use of individual and group problem solving, attendees will learn about transformers, motors, generators, one-line diagram interpretation, protection and coordination of electrical equipment, emergency power, site and standby generation, electrical safety, and hazardous areas. Participants will gain a better understanding of electrical components and systems and will develop a greater appreciation for electrical engineering.

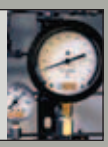
COURSE CONTENT
· Fundamentals of electricity · Direct current · Basic AC theory · Transformers · Motors · Power distribution · System protection and coordination · Emergency power generators, direct current systems and uninterruptible power systems · Power generation · Variable speed drives · Programmable electronic systems · Electrical safety · Grounding and bonding · Hazardous area

2013 SCHEDULE AND TUITION

HOUSTON
11-15 FEB 2013 ..... US $3,846

ORLANDO
21-25 OCT 2013 ..... US $3,846

Instrumentation and Controls Fundamentals for Facilities Engineers (IC-3)



FOUNDATION - 5 DAYS

DESIGNED FOR
Facilities and Project Engineers as well as newly graduated Instrumentation, Controls and Electrical Engineers who need to improve their basic understanding of instrumentation and control systems within oil and gas facilities.

YOU WILL LEARN
· Field measurement devices including level, pressure, temperature, and flow · Final elements and actuators including control loops, control valves, shutdown valves, actuators, and transducers · Pressure relief and pressure regulation · How to document instrumentation including tag numbers, P&IDs, loop and logic diagrams · Process control basics with emphasis on control loops, types, strategies, and loop tuning · How programmable logic controllers operate as well as their advantages, application, functionality, architecture, and programming · Supervisory Control and Data Acquisition (SCADA) Systems to include types of communication and hardware used · Distributed Control Systems (DCS) including Fieldbus and Profibus · Risk mitigation, technologies, and architecture of Safety Instrumented Systems (SIS) · The best practices for hazardous areas and equipment selection which will include area classification, NEC, IEC, equipment protection, selection, certification, location, and ingress protection

ABOUT THE COURSE
This course applies fundamental instrumentation and control engineering principles to oil and gas facilities design and operation and is designed for Facilities Engineers with or without a background in instrumentation or control engineering. The course is also designed to accelerate the development of new facilities Instrumentation and Control Engineers. Through the use of individual and group problem solving, attendees will learn about field measurement devices, final elements and actuators, pressure relief and regulation, documentation, programmable logic controllers, power supplies, SCADA, DCS, SIS, and hazardous areas. Participants will gain a better understanding of instrumentation and control components and systems and will gain a greater appreciation for instrumentation and control engineering.

COURSE CONTENT
· Fundamentals · Field measurement devices · Final elements and actuators · Pressure relief and pressure regulation · Instrumentation documentation · Control system basics · Programmable logic controllers · Supervisory control and data acquisition (SCADA) systems · Distributed control systems (DCS) · Safety instrumented system (SIS) · Hazardous areas and equipment selection

2013 SCHEDULE AND TUITION

HOUSTON
18-22 FEB 2013 ..... US $3,846

CALGARY
22-26 APR 2013 ..... US $3,846

DENVER
22-26 JUL 2013. ..... US $3,846

PERTH
5-9 AUG 2013 ..... US $4,770

ORLANDO
28 OCT -1 NOV 2013 ..... US $3,846

DUBAI
3-7 NOV 2013 ..... US $4,770

HOUSTON
18-22 NOV 2013 ..... US $3,846

Electrical Engineering Practices for Facilities Engineers (E-4)

INTERMEDIATE - 5 DAYS

DESIGNED FOR
Facilities and Project Engineers with two or more years of experience; Instrumentation, Controls and Electrical Engineers with two or more years of experience, or those who have completed the E-3 course and need to further develop their understanding of electrical systems within oil and gas facilities.

ABOUT THE COURSE
This course applies Electrical Engineering principles to oil and gas facilities design and operation and requires some prior electrical knowledge. Electrical Engineering principles are reinforced through the use of individual and team problem-solving exercises, one-line diagram coordination, interpretation, and class discussions of interfaces between facilities engineers, contractors and maintenance personnel. Participants gain additional understanding of electrical equipment requirements for facilities and what is important to the Electrical discipline.

COURSE CONTENT
· Electrical project management · Standards and recommended practices · Distribution systems · Motors · Wire and cable · Transformers · Switchgear · Motor control centers · Switchboards and panels · Electrical faults (short circuits) and circuit protection · UPS and emergency power · Electrical system ground and bonding · Hazardous area classification

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Instrumentation and Controls Engineering Practices for Facilities Engineers (IC-4)

INTERMEDIATE - 5 DAYS

DESIGNED FOR
Oil and gas Facilities and Project Engineers, as well as Instrumentation, Controls and Electrical Engineers with two or more years of field experience who want to further improve their practical understanding of instrumentation/controls systems within oil and gas facilities. Attendees should have basic working knowledge of instrumentation and control fundamentals. Completion of IC-3 is a benefit.

ABOUT THE COURSE
An exercise is developed throughout the session to illustrate the process of instrumentation selection and specification for a pressure vessel. The required documentation is identified and developed for incorporation in a BPCS (basic process control system). The exercise does not require formal instrument engineering training but prior field experience is very helpful. Through the use of individual and team exercises and problem solving you will learn about instrumentation on a vessel, developing required calculations, preparing documentation. In addition, you will understand the various interfaces between facilities engineers, contractors and maintenance personnel. Participants will gain a better understanding of the instrumentation process and what is important to this discipline.

COURSE CONTENT
· Introduction · Basic project management · Front end engineering design (FEED) · Final design activities · Construction and commissioning · Weekly project design actives

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

NEW

PLC and SCADA Technologies (IC-71)

INTERMEDIATE - 5 DAYS

DESIGNED FOR
Instrumentation, electrical and process engineers and technicians involved in selecting, sizing, specifying, installing, testing, operating and maintaining programmable logic controllers (PLCs) and supervisory (SCADA) systems.

YOU WILL LEARN
- Describe the fundamental principles of the PLC
- Identify the basic components
- Write a ladder logic program
- Explain the basics of advanced programming according to IEC 61131-3
- Compare different methods of analog processing
- Apply common-sense installation practices
- Examine the different components of a SCADA system
- Describe the basic principles of serial communications
- Evaluate the requirements for PLC-to-SCADA communications
- Distinguish the specific requirements of the PLC in safety-related applications

ABOUT THE COURSE
This workshop provides engineers and technicians with the basic theoretical and practical understanding of PLC and SCADA systems. It traces the evolution of the PLC as an intelligent 'black box' replacement for the relay panel and how, with the advent of modern communications architectures, it is combined with supervisory control systems to allow stand-alone control systems to be configured.

Throughout the workshop, participants will learn through active participation using exercises, questionnaires, and practical PC-based simulation (LogixPro) covering: basic ladder logic programming; hardware diagnostics; and implementation of various communication strategies.

COURSE CONTENT
- Introduction to control systems
- SCADA versus DCS
- PLC environmental enclosures
- Processing and scanning
- Digital processing
- Analog processing
- Installation practices
- Interference or noise reduction
- Cable spacing and routing
- Earthing and grounding
- Binary and hexadecimal numbering systems
- The IEC 61131-3 standard
- Ladder logic diagrams
- Functional block diagrams
- Derived function blocks
- Structured text
- Instruction lists
- Sequential function chart
- SCADA basics
- System architecture communication strategies
- Asynchronous transmission
- Coding
- The RS 232 standard
- The RS 485 standard
- Modbus
- Safety PLCs
- Voting system architectures

2013 SCHEDULE AND TUITION
LONDON
13-17 MAY 2013 . . . . . US $4,774
HOUSTON
8-12 OCT 2013 . . . . . US $3,846

NEW

Valve and Actuator Technologies (IC-72)

INTERMEDIATE - 5 DAYS

DESIGNED FOR
Facilities, chemical, electrical, instrumentation, maintenance, and mechanical engineers and technicians involved in designing, selecting, sizing, specifying, installing, testing, operating and maintaining shutoff, pressure relief, and control valves.

YOU WILL LEARN
- Compare the major technologies used in the final control element
- Calculate the valve flow coefficient Cv
- Perform flow and system pressure head loss calculations
- Contrast the different types of control, shut-off, and check valves
- Describe the principles of cavitation control and noise reduction
- Select optimum materials of construction to avoid corrosion and erosion
- Identify the correct requirements for trim selection
- Differentiate between inherent and installed characteristics
- Identify ANSI/DN pipe sizes and pressure ratings
- Explain the control valve seat leakage classifications
- Evaluate the optimum valve-actuator combination
- Apply on-line valve testing and diagnostics for deadband and hysteresis, stick-slip and non-linearity
- Examine the principles of preventive maintenance through the application of signature analysis
- Perform a bench set and calculate actuator spring wind-up
- Pick the correct positioner using our set of guidelines

ABOUT THE COURSE
This workshop provides a total in-depth insight into valve and actuator technology covering: control valves, check valves, shut-off valves, solenoid valves, and pressure relief valves.

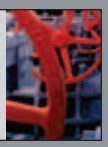
A methodology is presented to ensure the optimum selection of size, choice of body and trim materials, components, and ancillaries. Whilst studying both liquid and gas valve sizing, delegates will also learn the correct procedures for calculating the spring 'wind-up' or 'bench set'. Maintenance issues also include: testing for dead-band/hysteresis, stick-slip and non-linearity; on-line diagnostics; and signature analysis.

Throughout the workshop, participants will learn through active participation using exercises, questionnaires, and practical sessions covering: systems choice; basic sizing calculations; computer-based sizing; and maintenance diagnostics.

COURSE CONTENT
· Defining the valve flow coefficient, Cv · Choked flow · Pressure recovery · Flashing and cavitation · Cavitation control · Noise reduction · Control valve selection and sizing · Water hammer · Valve seat leakage classifications · Packing/stuffing box requirements · Globe valves · Gate valves · Pinch valves · Diaphragm valves · Ball valves · Butterfly valve · Plug valve · Check valves · Inherent vs. installed characteristics · Body selection guide · Trim selection guide · Actuator and accessory selection · Manual and computer-based valve sizing · I/P converter · Diaphragm actuators · Cylinder/piston-type actuator. · Electro-hydraulic actuation · Electric actuator · Solenoid valves · Transfer mechanisms · Valve positioners · Valve testing and diagnostics · Bench Set · Valve maintenance and repair · Safety relief valves · Rupture discs

2013 SCHEDULE AND TUITION
LONDON
20-24 MAY 2013 . . . . . US $4,774
HOUSTON
14-18 OCT 2013 . . . . . US $3,846

Piping Systems - Mechanical Design and Specification (ME-41)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Mechanical, facilities, plant or pipeline engineers and piping system designers who are involved in the design of in-plant piping systems for oil and gas facilities.

YOU WILL LEARN
- Apply piping system codes and standards
- About line sizing and layout of piping systems in various types of facilities
- How to specify proper components for process and utility applications
- Compare alternative materials of construction
- The process of steelmaking, pipe manufacturing and material specifications
- Joining methods and inspection techniques
- Key considerations for flare and vent systems, including PSV sizing

ABOUT THE COURSE
This five-day course for engineers and piping system designers reviews the key areas associated with the design of piping systems for oil and gas facilities. The course is focused on four areas: codes and standards, pipe materials and manufacture, piping components, and piping layout and design. Applicable piping codes for oil and gas facilities (ISO, B31.3, B31.4, B31.8, etc.), pipe sizing calculations, pipe installation, and materials selection are an integral part of the course. The emphasis is on proper material selection and specification of piping systems.

COURSE CONTENT
- Piping codes and standards (ANSI/ASME, API, ISO)
- Pipe materials and manufacturing
- Basic pipe stress analysis methods
- Valves and actuators
- Welding and non-destructive testing
- Line sizing basics (single-phase and multiphase flow)
- Pipe and valve material selection
- Piping layout and design
- Manifolds, headers, and flare/vent systems
- Non-metallic piping systems
- Operations and maintenance considerations of facilities and pipelines

2013 SCHEDULE AND TUITION

HOUSTON
4-8 MAR 2013 . . . . . US $3,846

LONDON
22-26 APR 2013 . . . . . US $4,774

DENVER
22-26 JUL 2013 . . . . . US $3,846

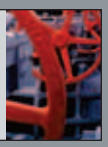
LONDON
2-6 SEP 2013 . . . . . US $4,774

DUBAI
6-10 OCT 2013 . . . . . US $4,882

ORLANDO
4-8 NOV 2013 . . . . . US $3,846

BRISBANE
9-13 DEC 2013 . . . . . US $4,770

Fundamentals of Pump and Compressor Systems (ME-44)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Engineers, senior technicians and system operators designing, operating and maintaining pump and compressor systems in oil and gas facilities.

YOU WILL LEARN
- Selecting the appropriate integrated pump and compressors units (drivers, pumps, compressors, and auxiliary systems).
- Integrating the pump or compressor units with the upstream and downstream piping and process equipment.
- Evaluating pump and compressor units and their drivers in multiple train configurations – parallel and series.
- Identifying the key local and remote control elements of pumps and compressors as well as their drivers.
- Defining the major life-cycle events such as changes in flows, changes in fluid composition, and changes in operating conditions that can affect equipment selection and operating strategies.
- Assessing key pump hydraulics and compressor thermodynamics and their affect on selection and operations.
- Identifying significant conditioning operating monitoring parameters and troubleshooting techniques.

ABOUT THE COURSE
This is an intensive 5-day course providing a comprehensive overview of pumps and compressor systems. The focus is on equipment selection – type, unit and station configuration, integration of these units in the process scheme and control strategy in upstream and midstream oil and gas facilities. The material of the course is applicable to field process facilities, pipelines, gas plants, and offshore systems.

COURSE CONTENT
· Types of pumps, compressors, and drivers and their common applications and range of operations. · Evaluation and selection of pumps and compressors and their drivers for long-term efficient operations. · Unit and station configuration including multiple trains in series and/or parallel operations. · Integration with upstream and downstream process equipment, local and remote control systems, and facilities utilities. · Key auxiliary systems including monitoring equipment, heat exchangers, lube and seal systems, and fuel/power systems. · Major design, installation, operating, troubleshooting, and maintenance considerations.

2013 SCHEDULE AND TUITION

HOUSTON
11-15 MAR 2013 . . . . . US $3,846

LONDON
15-19 APR 2013 . . . . . US $4,774

DENVER
29 JUL - 2 AUG 2013 . . . . . US $3,846

LONDON
9-13 SEP 2013 . . . . . US $4,774

DOHA
29 SEP - 3 OCT 2013 . . . . . US $4,882

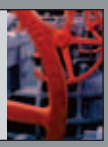
RIO DE JANEIRO
14-18 OCT 2013 . . . . . US $4,346

ORLANDO
11-15 NOV 2013 . . . . . US $3,846

DUBAI
17-21 NOV 2013 . . . . . US $4,882

KUALA LUMPUR
2-6 DEC 2013 . . . . . US $4,856

Compressor Systems - Mechanical Design and Specification (ME-46)



SPECIALIZED - 5 DAYS

DESIGNED FOR
Mechanical, facilities, plant, or pipeline engineers and technicians needing an in-depth understanding of the different types of compressors.

YOU WILL LEARN
- How to apply thermodynamics to compressor performance and operating characteristics
- How to size, specify, and select compressors
- Compressor auxiliary systems
- Series and parallel application of compressors
- How to integrate compressor systems into process facilities used in the oil and gas industry
- How to use state-of-the-art monitor and control devices in the operation, maintenance, and troubleshooting of compression systems
- How to apply maintenance practices to improve compressor reliability
- Shop and field performance testing
- Compressor economics including OPEX vs. CAPEX considerations

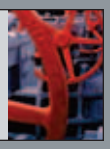
ABOUT THE COURSE
This five-day course is for facility design engineers, operations engineers and technicians seeking an in-depth understanding of centrifugal, reciprocating, and screw compressors. This course provides basic knowledge of compressor types and associated auxiliary systems, mechanical design of equipment, operating and performance characteristics, control and monitoring systems, maintenance practices, and codes and standards.

COURSE CONTENT
- Types and application of compressors
- Selection criteria of dynamic and positive displacement compressors
- Compressor thermodynamics and operating characteristics
- Performance curves and off-design evaluations
- Key compressor components and other auxiliary systems
- Equipment specifications
- Compressor controls and monitoring devices
- Driver and gear involvement
- Installation, operation, maintenance practices, and troubleshooting
- Economic considerations

2013 SCHEDULE AND TUITION

ORLANDO
21-25 OCT 2013 . . . . . US $3,846

Rotating Machinery Best Practices (ME-47)



FOUNDATION - 5 DAYS

DESIGNED FOR
Engineers, senior technicians and system operators designing, operating and maintaining rotating equipment in oil and gas facilities. Best practices from a variety of rotating machinery topics, representing many years of collective experiences, are presented in this course. In addition, the experience of the instructors allows many topics to be discussed in addition to those topics selected. ***The proper application of even one of the best practices is worth several times the cost of attending the course.***

YOU WILL LEARN
- Project machinery best practices
- Pump best practices
- Compressor best practices
- Steam turbine best practices
- Gas turbine best practices
- Lubrication system best practices
- Seal oil system best practices
- Pump mechanical seal best practices
- Dry gas seal best practices
- Preventative maintenance best practices
- Predicative maintenance best practices
- Implementation & communication best practices

ABOUT THE COURSE
This is an intensive 5-day course providing a comprehensive overview of pumps, compressors, steam turbines, lubrication systems, seals and other machinery and practices related to rotating machinery. The focus is on equipment and system best practices– type, unit and station configuration, integration of these units in the process scheme and control strategy in upstream and midstream oil and gas facilities. The material of the course is applicable to all oil and gas field production facilities, refineries, pipelines, gas plants, marine applications and offshore systems.

COURSE CONTENT
- Life cycle cost considerations
- Selecting pumps to operate in best flow range
- Detailed component experience checks prior to purchase
- Review of blade experience prior to purchase
- Site power sizing guidelines
- System component design audit guidelines
- System stability modification best practices
- Practical seal monitoring guidelines
- Seal gas systems, intermediate and separation systems
- Essential PM items to assure optimum reliability
- The concept of Component Condition Monitoring
- Management presentations that assure implementation

PRESENTED BY FORSTHOFFER AND ASSOCIATES

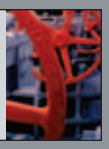
2013 SCHEDULE AND TUITION

LONDON
11-15 MAR 2013 ..... US $4,774

HOUSTON
22-26 APR 2013 ..... US $3,846

ORLANDO
28 OCT - 1 NOV 2013 ..... US $3,846

Turbomachinery Monitoring and Problem Analysis (ME-62)



SPECIALIZED - 5 DAYS

DESIGNED FOR
Experienced mechanical or facilities engineers and senior technicians needing an understanding of control, monitoring and troubleshooting turbomachinery utilized in the oil and gas industry.

YOU WILL LEARN
- To understand various types and classes of turbomachinery (drivers and driven equipment)
- To understand system integrity (availability and reliability)
- How to evaluate turbomachinery performance during startup and operation
- How to identify turbomachinery system and auxiliary components
- How to define and use appropriate monitoring techniques and tools
- How to utilize effective operation and shutdown procedures
- How to analyze common turbomachinery problems, such as vibration, performance degradation, system or control induced instabilities and surge
- How to solve instrumentation, system and control problems
- Understand the inter-relationships of drivers, couplings, gearboxes, and driven equipment
- Installation techniques, equipment failures and different maintenance practices
- Economic considerations

ABOUT THE COURSE
This five-day course is an intensive, intermediate level program for experienced mechanical equipment engineers or facilities engineers to develop and expand their capabilities in controls, monitoring and problem analysis of turbomachinery. This course focuses on defining the systems and subsystems that form the turbomachinery; the potential problems with these systems and subsystems; monitoring techniques for early detection of problems; and methods to analyze the monitored variables to detect potential problems or reconstruct reasons for failures. Case studies are used throughout the course.

COURSE CONTENT
·Turbomachinery in the oil and gas industry · Machine integrity · Monitoring and turbomachinery · Vibration and vibration monitoring · Process parameters (pressure, temperature, flow, equipment performance) · Operating principles of gas turbines · Electric machinery: motors and generators · Installation · Drivers: Steam turbines, gas turbines, engines · Driven equipment: Pumps · Transmission systems · Auxiliary Systems · Pumps · Compressors · Key performance variables and means to monitor · Principals of operation and major components of gas turbines: rotors, blades, shafts, combustion chambers, nozzles, etc. · Auxiliary systems: lube oil, seal oil, fuel, start-up, etc. · Evaluation of turbine performance parameters during start-up and normal operation · Troubleshooting control systems for gas turbines: start-up, speed and temperature controls, vibration · Principles of operation and general components of compressors: rotors, seals, diaphragms, etc · Operating characteristics curves · Surge phenomenon · Choke phenomenon · Compressor instrumentation: various control loops; anti-surge control loops · Compressor safety interlock and trip systems · Gas turbine and compressor systems start-up and shutdown procedures · Normal operation - monitoring of parameters · Logging of monitoring checks · Vibration monitoring · Troubleshooting · Case Studies

2013 SCHEDULE AND TUITION

HOUSTON
30 SEP - 4 OCT 2013 ..... US $3,846

JOHN M. CAMPBELL & CO.

INSTRUCTOR SPOTLIGHT

WES WRIGHT

What courses do you teach?

I teach mostly the PF-81 CO_2 Surface Facilities and PF-4 Oil Production and Processing courses.

Do you have a favorite city to visit?

I'm still looking for a "favorite." Each city is unique and I enjoy getting out and just walking around - watching the people, looking in the shops and trying the local cuisines. If I had to choose at this point, I'd say I like the European cities - with their bicycle paths, public transit systems and small, local markets. I am constantly impressed with the small kindnesses people show to a complete stranger who (usually) doesn't even speak the language!

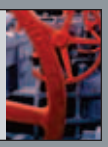
A favorite food from one of the cities in which you teach?

I really enjoy the Cajun foods from New Orleans - like crawfish pie, gumbos, jambalaya, soft shell crab and Po'boys. I like to try the local specialities from each place I visit, but I am especially fond of seafoods. I have learned to save the more adventurous meals for after the course is over!

Do you have a favorite hobby you enjoy?

My favorite hobby is scuba diving. I am a Certified PADI Dive Master and I have been fortunate to dive is some spectacular places. There is no more peaceful place on earth than 15 or 20 meters below the surface, floating along above a coral reef.

Principles of Reliability Engineering (REL-4)



INTERMEDIATE - 5 DAYS

DESIGNED FOR

Maintenance, engineering and operations personnel involved in improving reliability, availability, condition monitoring, and maintainability of process equipment and systems. Participants should have foundation skills in statistical analysis and reliability techniques for equipment.

YOU WILL LEARN

- RE Fundamentals
  - Important Definitions
  - Three Types of Availability
  - How Equipment Spends Its Time
- Statistical Analysis for Reliability Engineering
  - Why Gaussian Statistical Analysis May Not Apply
  - Weibull Analysis
- Reliability-Centered Maintenance (RCM) Methodology
  - Seven Questions of RCM
  - Six Failure Patterns and the Maintenance Strategies for Battling Them
  - Failure Modes, Effects, and Criticality Analysis
  - How to Apply RCM in Operating Facilities
  - How to Apply RCM in New Facilities
  - How to Implement a Reliability-Centered Maintenance Program
  - RCM with Simulation and Modeling
- Root Cause Analysis (RCA) Methodology
  - Elements of RCA
  - How to Implement a Successful RCA Program
- Availability Simulation and Modeling
  - Building Reliability Block Diagrams (RBDs)
  - Assessing System Design
  - Assessing Maintenance Strategies
  - Assessing Spares Holding Strategies
- Failure Reporting, Analysis, and Corrective Action Systems (FRACAS)
  - Relationship to RCM, RCA, Statistical Analysis, and Availability Simulation and Modeling
  - Fundamental System Requirements
  - How to Implement FRACAS

ABOUT THE COURSE

This course is designed to teach the skills of Availability Engineering as detailed in the Facilities Maintenance Management and Reliability Engineering Competency Maps. We will use statistical analysis examples and Monte Carlo Simulation software to measure plant availability and optimize it against business need. Case studies and exercises will be used to demonstrate availability optimization techniques and their benefits.

COURSE CONTENT

· Statistical analysis techniques · MTBF · MTTR · Weibull Analysis · Monte Carlo simulation · Availability analysis and simulation · Equipment performance gap analysis · Work procedure analysis for maintainability · Creating improvement actions in the organization

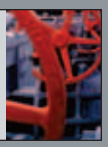
2013 SCHEDULE AND TUITION

HOUSTON
13-17 MAY 2013 . . . . . US $3,846

DUBAI
30 SEP - 4 OCT 2013 . . . . . US $4,774

ORLANDO
2-6 DEC 2013 . . . . . US $3,846

Rotating Equipment Reliability Optimization (REL-41)



FOUNDATION - 5 DAYS

DESIGNED FOR

Maintenance, engineering and operations personnel involved in improving reliability, availability, condition monitoring, and maintainability of process equipment and systems. Participants should have foundation skills in statistical analysis and reliability techniques for equipment.

YOU WILL LEARN

- Fundamentals and reliability terms
- Causes of machinery failures (5 whys)
- Failures are not random
- The Effects of Process Changes
- Installation errors
- Operating procedures
- Design problems
- Component wear out
- RCFA (Root Cause Failure Analysis) procedures and techniques (rotors, journal bearings and vibration, thrust bearings, balance drums, pump mechanical seals, compressor seals - liquid and dry gas, and auxiliary systems)

ABOUT THE COURSE

This is an intensive 5-day course providing a comprehensive understanding of root cause failure analysis through a variety of exercises used to conduct failure analysis in the class. After an introduction to essential reliability terms, exercises are used extensively to immerse the participant in real world scenarios involving common rotating equipment reliability issues: rotors, journal bearings and vibration, thrust bearings, balance drums, pump mechanical seals, compressor seals (liquid and dry gas) and auxiliary systems. The material of the course is applicable to all oil and gas field production facilities, refineries, pipelines, gas plants, marine applications and offshore systems.

COURSE CONTENT

- Fundamentals and reliability terms
- The causes of machinery failures (5 why's)
- "Failures are not random"
- Process condition changes
- Installation errors
- Operating procedures
- Design problems
- Component wear out
- Root Cause Failure Analysis (RCFA) procedure and example
- Rotors – the effect of process head
- Journal bearings and vibration
- Thrust bearings and balance drums
- Pump mechanical seals
- Compressor seal systems (liquid and dry gas)
- Auxiliary systems
- Equipment knowledge
- Defining abnormal conditions
- Listing all possible causes
- Eliminating non-related causes
- Stating root cause of the problem
- Developing and implementing final action plan

PRESENTED BY FORSTHOFFER AND ASSOCIATES

2013 SCHEDULE AND TUITION

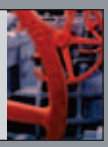
LONDON
18-22 MAR 2013 . . . . . US $4,774

HOUSTON
29 APR - 3 MAY 2013 . . . . . US $3,846

ORLANDO
4-8 NOV 2013 . . . . . US $3,846

NEW

Risk-Based Inspection (REL-61)



INTERMEDIATE - 5 DAYS

DESIGNED FOR

Inspection maintenance, production and other plant engineers and technicians responsible for the safe on-going operation of pressure containing equipment in oil and gas facilities.

YOU WILL LEARN

- How to apply fundamental principles of risk analysis, using practical application through case histories and a step-by-step evaluation process for each type of damage mechanism
- How to quantitatively determine probability of failure of pressure equipment, analyse consequences of failure and develop an appropriate inspection plan
- About the fundamental principles of component integrity, application of the API rules, material properties of strength and toughness, and the introduction to stress and fracture mechanics
- How to assess the integrity of equipment and make projections about its remaining useful life
- Assessment of existing static equipment to increase the equipment capacity and to extend service life time. API 579-1/ASME FFS-1 provides calculations that can be used to re-rate the component.
- To apply and use API RP 580 and API RP 581 recommended practices. For pressurized components (e.g. pressure vessels and piping), these assessments can be used to determine optimum inspection intervals through the considered application of ASME section V NDE techniques.

ABOUT THE COURSE

The risk-based approach requires a systematic and integrated use of expertise from the different disciplines that impact plant integrity. These include design, materials selection, operating parameters and scenarios, and understanding of the current and future degradation mechanisms and of the risks involved. Risk-Based Methodologies enable the assessment of the likelihood and potential consequences of equipment failures. RBI (Risk-Based Inspection) provides companies the opportunity to prioritize their equipment for inspection; optimize inspection methods, frequencies and resources and develop specific equipment inspection plans. This results in improved safety, lower failure risk, fewer forced shutdowns, and reduced operational costs.

COURSE CONTENT

- RBI philosophy based on API RP 580
- Risk-Based Decision-Making Fundamentals and Tools
- Technical integrity and mechanical properties of pressure equipment.
- Understanding and managing risk
- Fires, Vapor Cloud Explosions (VCE) and Boiling Liquid Expanding Vapor Explosions (BLEVE)
- API Risk-Based Inspection Methodology
- Damage mechanisms affecting pressure equipment in the oil and gas industry
- Non-destructive examination techniques (NDE and NDT)
- API RP 581 Part 1 – Inspection Planning
- API RP 581 Part 2 – Failure Probability Quantification and Reliability Assessments
- API RP 581 Part 3 – Consequence Analysis and Mitigation Management
- Fitness for Service assessments using API 579-1/ASME FFS-1
- Inspection plan development and implementation
- RBI rollout and management

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

New Course in 2013

Finally, a 5-Day Intensive Course Covering:

Risk Based Inspections

Are you a Facilities Engineer Concerned with the Safe Operations of Pressure Containing Equipment? If so, consider REL-61 (Risk Based Inspections) and Learn:

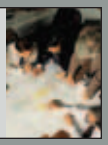
- How to apply fundamental principles of risk analysis using practical case histories and a step-by-step evaluation process.
- How to quantitatively determine probability of failure of pressure equipment. Plus, be able to analyze consequences of failure and develop an appropriate inspection plan.
- What the fundamental principles of component integrity are and how to specifically apply the API rules.
- How to assess the integrity of equipment and make projections about its remaining useful life.
- How to apply and use API RP 580 and API RP 581 recommended best practices. And much more! (For more information, see page 36 in this catalog)

Additional Course Content Includes:

- RBI philosophy based on API RP 580
- Risk-Based Decision-Making Fundamentals and Tools
- Technical integrity and mechanical properties of pressure equipment
- Understanding and Managing Risk
- Fires, Vapor Cloud Explosions (VCE) and BLEVEs
- API Risk-Based Inspection Methodology
- Damage mechanisms affecting pressure equipment in the oil and gas industry
- Non-destructive examination techniques (NDE and NDT)
- API RP 581 Part 1 – Inspection Planning
- API RP 581 Part 2 – failure probability quantification & reliability assessments
- API RP 581 Part 3 – consequence analysis and mitigation management
- Fitness for Service assessments using API 579-1/ASME FFS-1
- Inspection plan development and implementation
- RBI rollout and management

Enroll Now at www.jmcampbell.com/REL61

Applied Maintenance Management (OM-21)



BASIC - 5 DAYS

DESIGNED FOR
Maintenance supervisors, team leaders, or managers needing to improve their maintenance programs. This course is a broad survey of essential aspects of maintaining a safe, efficient and reliable facility asset.

YOU WILL LEARN
- Why unplanned jobs are 5 times more likely to result in an accident
- World class maintenance standards and how to apply them
- What it takes to progress from Reactive to Preventive to Predictive to Proactive
- How to develop consistent, reliable, timely and accessible asset work information
- Key Performance Indicators for your dashboard
- Essential elements of work planning & scheduling
- How to understand and use backlogs effectively
- Optimization of Preventive and Predictive maintenance
- How to focus your resources on critical equipment
- How to work with contractors more effectively
- How to develop organizational competence

ABOUT THE COURSE
Safety is the number one reason to take this course! We will focus on how to reduce your accident rate through better control of the maintenance work. Data shows that maintenance workers are 5 times more likely to suffer an injury if their job is reactive rather than planned and scheduled. The skills of Applied Maintenance Management are a necessary foundation for successful reliability-centered maintenance efforts. This course provides essential knowledge required for achieving excellence in maintenance management. Work control, planning, and scheduling will be covered. Participants will receive a sound, integrated, basic knowledge of the maintenance function and how to progress towards world-class performance. Individual action plans will carry course learning into the work environment. Better utilization of Computerized Maintenance Management Systems (CMMS) will be covered. A pre- and post-seminar self-assessment will be given to indicate delegates' competency improvements. The assessment is taken from the PetroSkills industry standard competency map for Maintenance Management. This course is one of our most popular and has been delivered worldwide for many diverse facilities such as drilling, wells, pipeline systems, oil and gas conditioning, refining, and shipping as well as a broad range of other types of industrial environments.

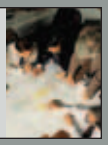
COURSE CONTENT
- Safe behavior and near-misses
- World class standards
- Maintenance strategies
- Planning and scheduling
- Optimizing Preventative and Predictive maintenance
- Identifying critical equipment
- Utilizing your CMMS
- Supplier certification
- Developing organizational competence
- Presenting your action plan

2013 SCHEDULE AND TUITION

HOUSTON
11-15 MAR 2013 . . . . . US $3,529

ORLANDO
16-20 DEC 2013 . . . . . US $3,529

Maintenance Planning & Work Control (OM-41)



FOUNDATION - 5 DAYS

DESIGNED FOR
Maintenance and Operations managers, superintendents, supervisors, team leaders and planners engaged in work management, planning, and scheduling.

YOU WILL LEARN
- Why work control is essential to every safety program
- How to install world class planning and work control
- Employ business process analysis techniques in work control
- How to use a gap analysis on your work management system
- Step-by-step work control from identification by using work history
- Optimization of preventive and condition-monitoring activities
- Techniques of critical equipment analysis, critical spares control and emergency response work
- To make an action plan for taking your work control processes to a new level

ABOUT THE COURSE
Safety is the reason we must plan and schedule our maintenance activities! Efficiency and reliability are very good side effects. Participants will be able to assess their current state of control of work and determine the most effective and sustainable improvement efforts. New work control standards such as PAS-55, ISO 50001, and OSHA 1910 are being enforced with greater intensity and this course will provide a substantial insight into what these standards mean. This working seminar is designed to build competency in Work Control as a primary skill set in the Competency Map for Facilities Maintenance Management. We will focus on the six phases of work management: work identification, planning, prioritization, scheduling, execution and history capture. Mastering these essential skills are the key components of integrity management, behavioral safety, resource control, and reliable operation. A pre- and post-course self-assessment will be used to measure competency improvement. Each participant will develop an action plan to help their organizations become more efficient and safe and be ready to present it to their corporate teams.

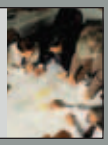
COURSE CONTENT
- Key elements in work information control
- How other companies have achieved excellence in work management
- Best ways to integrate with your CMMS
- The importance of correct work identification and approval
- Planning roles, responsibilities and capacity
- How prioritization drives scheduling
- Scheduling work so that everyone can follow
- Skillful use of backlog information to plan work
- Precision execution and capturing "as found, as left"
- Creating useful history records and using them for better performance
- Optimizing preventive maintenance to track what is 'prevented'
- Using predictive maintenance technologies as a basis for risk-based decisions
- How to utilize resources to focus on critical equipment
- How to differentiate emergency response from 'urgent' need for maintenance
- How to develop loyal and supportive maintenance customers

2013 SCHEDULE AND TUITION

HOUSTON
29 APR -3 MAY 2013 . . . . . US $3,529

ORLANDO
14-18 OCT 2013 . . . . . US $3,529

Project Management for Engineering and Construction (OM-22)



FOUNDATION - 5 DAYS

DESIGNED FOR
Small project managers, project engineers, facility engineers, operations engineers, and purchasing personnel including team leaders and managers who plan, manage, or participate on multi-discipline project teams.

YOU WILL LEARN
- Define project phases and execute them skillfully
- Develop Scopes of Work and Execution Plans
- Utilize control techniques and earned value analysis
- Develop checklists to ensure project deliverables for each phase are addressed
- Apply project management skills to your current projects
- Guide projects through technical reviews and secure management approvals
- Develop sustainable, repeatable knowledge management for projects

ABOUT THE COURSE
This course will provide a comprehensive presentation and discussion of modern project management principles and practices as they relate to project concept selection, development planning, engineering design; procurement; and construction activities for facilities in the oil and gas industry. The specific training received in schedule and cost management, risk management, and the proper use of scarce resources (people and materials) will help the project manager make the best decisions possible. Upon completion of this course, the participant will know what the six project management phases entail and be able to employ key project management knowledge areas and project control tools to facilitate successful project outcomes. Participants will understand how project management process groups relate to one another, how execution plans are used to integrate the work effort, what tools are available for the project manager to use, what information will be generated, and what that information means. The course is taught using a combination of instruction, facilitated discussion, and hands-on exercises using "real-world" project examples related to facilities design, procurement, and construction. The exercises will include both individual and group activities that will provide each participant with a visual application of the principles and practices discussed throughout the course.

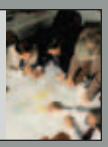
COURSE CONTENT
- Introduction to project management systems for the oil & gas industry
- Six phases of a project system
- Key project management knowledge areas:
  - Leadership
  - Project Types
  - Contracting
  - Execution Planning
  - HSE Management
  - Risk Management
  - Interface Management
  - Organization & Staffing
- Project Controls
  - Work Breakdown Structure
  - Planning & Scheduling
  - Progress Measurement
  - Cost Estimating
  - Earned Value
  - Change Management
  - Reviews & Approvals

2013 SCHEDULE AND TUITION

HOUSTON
4-8 MAR 2013 . . . . . US $3,529

HOUSTON
14-18 OCT 2013 . . . . . US $3,529

Managing Brownfield Projects (OM-42)



FOUNDATION - 5 DAYS

DESIGNED FOR
Project engineers, maintenance and operations leaders planning and managing effective brownfield and shutdown projects.

YOU WILL LEARN
- How to make brownfield projects safer with less environmental risk
- Skills for managing projects in existing facilities
- How to use a stage-gate process for planning and executing a project
- How to manage multiple projects at the same time
- To develop and control a brownfield scope of work
- Special issues that arise in existing facilities
- How to measure progress with earned value
- Develop and use lessons learned for better future projects

ABOUT THE COURSE
This course is designed to teach skills to better plan and manage projects in existing facilities, including process shutdown, contractor management, commissioning and start up. These skills and their competencies are found on the PetroSkills Maintenance Management Competency Map. Participants will develop shutdown planning strategies and will create/manage the organizational structure necessary to be successful. This includes working with your project team, scope, and schedule and managing costs throughout the project. Exercises, games and discussions will make the sessions challenging and invigorating. Participants are encouraged to bring examples of the brownfield projects they are working on.

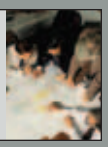
COURSE CONTENT
- Differences between brownfield and greenfield projects
- Using a stage-gate process to initiate, evaluate, plan, design, execute and close out brownfield projects
- Roles and qualities of successful project managers
- Detailed planning of the phases and components of the shutdown
- Contract types, contractor selection and contractor management
- Cost control strategies throughout the project
- Complicated schedules and their dynamics
- Tracking risk: identification, mitigation, contingencies and ownership
- Elements of procurement and materials management for the project
- Resource estimation and tracking from planning through execution and operation

Please note that OM-42 replaces our former OM-43 course. Due to popular demand, we have restructured and expanded our former course Effective Maintenance Shutdowns (OM-43) to include brownfield projects using stage gate models and other key management skills.

2013 SCHEDULE AND TUITION

ORLANDO
7-11 OCT 2013 . . . . . US $3,529

Essential Leadership Skills for Technical Professionals (OM-23)



BASIC - 5 DAYS

DESIGNED FOR
Anyone who has new responsibilities to lead a team. Supervisors, Team Leads, Managers and others interested in becoming a better leader and contributing team member will greatly benefit from this one week experience. Many may want to take this seminar/workshop more than once for continuous improvement.

YOU WILL LEARN
- Become a more effective leader by - Overcoming the "tyranny of the urgent" with better time management - Becoming the leader you want to work for
- Make better decisions by - Assessing when to make what kind of decisions - Developing more options to choose from
- Help others develop themselves by - Creating better individual development plans - Unleashing their career motivation
- Have more effective communications with technical and non-technical teams by - Learning to respond rather than react - Developing the patience to let the team do its work
- Recognize and resolve conflicts before they get out of control by - Early detection of conflicts, when they're simpler and have less impact - Developing skillful techniques for win-win outcomes
- Develop the ability to lead an empowered team of technical professionals by - Knowing how to guide the team rather than force the team - More effective delegation - Reduce your own stress level by - Recognizing how your stress affects others and your decisions, and doing something about it - Teaching yourself how to lower your stress with clearer thinking
- Learn assessment techniques for yours and other's people skills by - Learning the differences between skill and competency - Raising the competency levels of yourself and your team - Walk your talk by getting buy-in for your ideas and vision - Leading by example

ABOUT THE COURSE
In the oil and gas industry, skillful and competent leadership is extremely important for safety, productivity and asset management. The 21st century brings new emphasis on leaders, new communication technologies, increased focus on safety, information overload, workforce dynamics, asset integrity and many other concerns which challenge even the most proficient leader/manager. How do we blend these new challenges with tried and true wisdom of success? There are skills to learn that will help you be more effective, with less stress. In this seminar/workshop you will explore your internal drivers and learn how to combine them with new skills for greater effectiveness.
This seminar/workshop will include self-assessment, discussion, lecture, readings, role-playing, games, video examples and creation of participant action plans. This course will help you unleash natural motivation in your team. Your stress level can be lowered by working more efficiently and effectively by tapping the emotional intelligence of your team and co-workers.

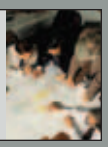
COURSE CONTENT
- The nature of teams
- Leadership vs. management
- Self-centering and tangential leadership
- Listening
- Motivation
- Group dynamics
- Conflict management
- Team-building
- Critical thinking and taking action

2013 SCHEDULE AND TUITION

HOUSTON
22-26 APR 2013 . . . . . US $3,529
ORLANDO
9-13 DEC 2013 . . . . . US $3,529

NEW

Advanced Project Management (FPM-62)



SPECIALIZED - 5 DAYS

DESIGNED FOR
Project Managers, Asset Managers, Project Control Managers and Project Engineers that are involved in the engineering, procurement and construction of surface facilities and pipelines for large onshore, offshore and pipeline projects.

YOU WILL LEARN
- Assess project governance structures for both domestic and international projects and create a plan to facilitate decision making
- Develop a project work breakdown, assess key market drivers and compose a contract strategy plan that minimizes project risk and effectively utilizes resources
- Identify and evaluate risks associated with technology selection and engineering development and prepare an engineering management plan
- Identify internal and external stakeholders and create a strategy to address their needs
- Establish a program to identify and manage project interfaces
- Evaluate the effects of major project risks and mitigate their impact on cost, schedule and operability
- Create a decision support package and successfully navigate the reviews and approvals process associated with funding gates
- Identify the information sources and reporting requirements for information systems used on large international projects

ABOUT THE COURSE
This five-day specialized level course is for Project Managers, Asset Managers, Project Control Managers and Project Engineers seeking an in-depth understanding of key topics associated with large domestic and international projects. This course provides advanced knowledge in contract strategy, project governance, engineering and technology management, stakeholder management, joint venture and non-operated projects, interface management, risk management, reviews and approvals and management information systems.

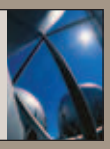
COURSE CONTENT
- Key aspects of a stage-gate process
- Influence of markets and regional practices on contract strategy development
- Governance structure influence on decision making
- Technology selection and engineering management in a limited resource environment
- Stakeholder identification and influence planning for large, complex projects
- How to influence the outcome of joint venture and non-operated projects
- Critical factors in successful interface management
- Risk identification and mitigation methodologies essential to preserve project value
- Managing expectations associated with peer reviews, technical assists and gate approvals

2013 SCHEDULE AND TUITION

HOUSTON
30 SEP - 4 OCT 2013 . . . . . US $3,529

Campbell Operator Training

P-3 Production/ Processing Operations (OT)



SKILLED - UP TO 10 DAYS

EXAMPLE CONTENT - ALL OT COURSES ARE CUSTOM BUILT

DESIGNED FOR

Plant and facility operators, supervisors and technicians.

YOU WILL LEARN

- Advanced level physical principles, hydrocarbon properties and hydrocarbon phase-behavior
- Practical thermodynamics, including mass and energy balances
- Principles of fluid dynamics and application to pumps and compressors
- To understand process equipment, including heat exchangers, fired heaters, separators, piping and towers with trays or packing
- To understand process unit operations, including gas dehydration, NGL extraction processes and stabilization/ fractionation

ABOUT THE COURSE

This course will provide a more detailed examination of the processes found in gas process facilities, including the important theoretical aspects that must be mastered before operators can truly understand their processes and become proficient at avoiding problems and troubleshooting the technical problems that do arise. This course prepares operations personnel to communicate better and work more closely with professional engineering staff. A problem set consisting of practical calculations that will be useful to operators beyond the classroom will be administered during the course. A high-quality scientific calculator is issued to all participants of the P-3 course. It is an effective introduction to the G-4 engineering-level course. Course content is customized to client needs.

AVAILABLE TOPICS

- Hydrocarbons and hydrocarbon system language
- Units of measurement
- Process drawings
- Overview of oil and gas processing
- Important properties of hydrocarbons
- Phase behavior fundamentals
- Practical thermodynamics: mass and energy balances
- Heat transfer and fired heaters
- Mechanical refrigeration
- Introduction to process control
- Basic principles of fluid flow
- Centrifugal pumps
- Centrifugal compressors
- Reciprocating compressors
- Introduction to gas turbines
- Production separators and oil dehydration
- Water treating
- Corrosion and corrosion monitoring
- Amine gas sweetening
- Sulfur recovery
- Mass transfer operations
- Water-hydrocarbon behavior
- TEG gas dehydration
- Mole sieve dehydration
- Gas expansion NGL recovery (valve & turboexpander)
- Crude oil, condensate, and NGL stabilization
- NGL fractionation
- Process troubleshooting

THIS COURSE IS ALSO AVAILABLE IN NON-MATHEMATICAL, BASIC VERSION OF 5 DAYS DURATION.

EMAIL JMCSUPPORT@JMCAMPBELL.COM OR CONTACT US AT 1-405-321-1383 FOR MORE INFORMATION.

Skilled Operators are Safe Operators

Who Should Attend Campbell Operator Training Courses?

- New Operators
- Technicians
- Operators Joining New Crews
- Seasoned Operators
- Supervisors

Training designed to help your operators perform safely & efficiently

Important Campbell Operator Training Features:

- Customized courses based on YOUR PFD diagrams
- Improve the technical communication between operators and engineers
- Develop in-depth understanding of process operations
- Mixed and matched course topics from a bank of course content
- Flexible Course Lengths (3/5/10 day courses available)
- Flexible and adaptable to shift schedules
- Non-mathematical introductory courses available
- Advanced level courses available

Campbell Operator Training Gets Your Operators Up to Speed Quickly

To bring Campbell Operator Training to your facility and for more information go to www.jmcampbell.com/operator-training or email jmcsupport@jmcampbell.com.

OPERATOR TRAINING

Gas Dehydration Operations (OT)

BASIC - 2 DAYS

EXAMPLE CONTENT OF AN IN-HOUSE COURSE CUSTOMIZED TO YOUR LOCATION

DESIGNED FOR

Plant and facility operators, supervisors and technicians.

YOU WILL LEARN

- To determine the water content of produced natural gas
- The problems and dangers of hydrate formation
- Effective methods of hydrate inhibition
- Principles and operational elements of TEG gas dehydration
- Principles and operational elements of Mole Sieve gas dehydration

ABOUT THE COURSE

This course will provide the basic knowledge required for understanding operating issues in natural gas dehydration units. This course is customizable to client needs.

COURSE CONTENT

- Types of dehydration processes: absorption, adsorption and condensation
- Water vapor content of gaseous hydrocarbons
- Hydrates and hydrate inhibition
- Dewpoint depression
- Mass transfer operations: absorption and stripping, trays vs. packing
- TEG equipment: gas scrubbers, glycol contactors, flash tank, filters, lean/rich heat exchanger, regenerator, stripping gas
- Operating procedures and problems for TEG systems: startup and shutdown, normal operations, glycol losses, corrosion, troubleshooting
- Care of the TEG solution
- Mole sieve gas dehydration
- Adsorbers and desiccants
- Mass transfer zone
- Regeneration system
- Operation and adsorbent life
- Mole Sieve operating problems and troubleshooting

EMAIL JMCSUPPORT@JMCAMPBELL.COM OR CONTACT US AT 1-405-321-1383 FOR MORE INFORMATION.

Cryogenic NGL Recovery and NGL Fractionation (OT)

BASIC - 4 DAYS

EXAMPLE CONTENT OF AN IN-HOUSE COURSE CUSTOMIZED TO YOUR LOCATION

DESIGNED FOR

Plant and facility operators, supervisors and technicians.

YOU WILL LEARN

- To use hydrocarbon system language
- Basic principles of gas processing
- The physical properties of natural gas and NGL components
- Practical application of the principles of hydrocarbon phase behavior
- Principles, operation, and troubleshooting of mechanical refrigeration systems
- Operating principles and issues in gas expansion NGL recovery (Turboexpander and J-T Valve) processes
- Operating principles and techniques for NGL stabilization and fractionation

ABOUT THE COURSE

This course will provide the basic knowledge required for understanding operating issues in cryogenic NGL (Natural Gas Liquids) extraction and stabilization/fractionation. Course content is non-mathematical and customizable to client needs.

COURSE CONTENT

- Hydrocarbon systems: reservoir fluids
- Hydrocarbon series: paraffins
- Physical properties of hydrocarbons
- Fluid properties: VLE, vapor pressure, boiling point, etc.
- Pressure-temperature phase diagrams (phase envelopes)
- Application of phase envelopes: hydrocarbon dewpoint control, equilibrium stage concepts, flash separators and fractionators
- Mechanical refrigeration: principles and equipment
- Tray-type towers; packed towers
- Components of turboexpander NGL recovery plants
- Turboexpander-compressor and utilities
- Principles of gas expansion NGL recovery and process variations
- Stabilizers, fractionators, and fractionation trains
- The basic fractionator and operator control techniques
- Troubleshooting

EMAIL JMCSUPPORT@JMCAMPBELL.COM OR CONTACT US AT 1-405-321-1383 FOR MORE INFORMATION.

Operator Training for Oil & Gas Processing Facilities (OT-1)

BASIC - 5 DAYS

PUBLIC COURSE

DESIGNED FOR

Production operators and other non-engineering personnel requiring a broad introduction to production facilities and processes, including the separation, conditioning and disposition of produced oil, gas and water; including the common operational difficulties that may arise, as well as the operational tactics used to resolve them.

YOU WILL LEARN

- About the effects of produced fluid (OGW) compositions on facility design and operation
- About various separation and conditioning processes for meeting specifications on oil, gas and produced water streams
- How to determine the water vapor content of produced natural gas
- How to recognize problems and dangers of hydrate formation
- About methods and issues in hydrate prevention/inhibition

ABOUT THE COURSE

This course will provide the basic knowledge required for understanding processes and operating issues common to all locations. See below for customized content per location.

COURSE CONTENT

- Produced Hydrocarbon Fluids
- Process Drawings
- Production Facility Operations
- Basic Physical Principles
- Oil and Condensate Processing
- Produced Water Treating
- Gas Conditioning and Processing
- Auxiliary Systems (Gas Lift, Sea Water Treating)

2013 SCHEDULE AND TUITION

**See regionally customized content below*

STAVANGER
3-7 JUN 2013 ..... US $4,586

BRISBANE
5-9 AUG 2013 ..... US $4,578

MIDLAND
11-15 NOV 2013 ..... US $3,691

OPERATOR TRAINING

Operator Training Public Course Sessions (OT-1)

Regionally Specific Topics in Addition to Core Content Above

STAVANGER

- Typical North Sea oil and gas producing operations
- Produced water treating, seawater treating
- Other offshore topics of general interest

BRISBANE

- Gas processing
- Intro to Liquefied Natural Gas (LNG) processes

MIDLAND

- Gas conditioning and processing
- Sour gas treating
- Sulfur recovery

Go to www.jmcampbell.com/ot1

NEW

Process Safety Overview – Non-Technical (PS-2)

FOUNDATION - 3 DAYS

DESIGNED FOR
Operators, maintenance personnel, facilities managers/supervisors, facilities engineers, HSE practitioners, project managers and anyone who could benefit from a broad overview of the elements associated with process safety in the upstream oil and gas industry. The course does not address the calculations engineers will perform in process safety engineering.

YOU WILL LEARN
- ·The elements of a risk based process safety management system and your role in the system
- Types of equipment and process systems that have historically been problematic in the upstream oil and gas industry
- The definition of risk and how to determine appropriate risk reduction strategies
- Most commonly used process hazards analysis methods and where they are used
- "Layers of Protection" concept – what the different layers are and how they are applied
- The role of all disciplines within process safety activities
- How to ensure that all tasks associated with upstream oil and gas processing are managed safely

ABOUT THE COURSE
This course provides an overview of process safety fundamentals for hydrocarbon processing facilities, with emphasis on the upstream oil and gas sector. The focus of this course is on how process safety is a key activity for all disciplines in the day-to-day activities of a facility. Frequent reference will be made to historical incidents and recurring problem areas. Techniques for analyzing and mitigating process safety hazards applicable to oil and gas processing will be reviewed. Integration of the concepts covered to achieve a measured approach to Process Safety Engineering is a key aim of this course. Exercises and group projects will be utilized throughout the course to emphasize the key learning points.

COURSE CONTENT
- Historical Incident and Problem Areas
- Elements of Risk Based Process Safety Management
- Process Hazards Analysis Techniques – Overview
- Layers of Protection
- Hazards Associated with Process Fluids
- Leakage and Dispersion of Hydrocarbon Releases
- Combustion Behavior of Hydrocarbons
- Sources of Ignition
- Hazards Associated with Specific Plant Systems
- Plant Layout and Equipment Spacing
- Pressure Relief and Disposal Systems
- Process Monitoring and Control
- Safety Instrumented Systems
- Fire Protection Principles
- Explosion Protection

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Fundamentals of Refining Technology (RF-31)

BASIC - 4 DAYS

DESIGNED FOR
Personnel in the petroleum refining business and related activities.

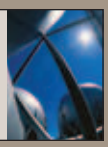
YOU WILL LEARN
- Sources of refinery feedstocks, crude or synthetic
- Composition of the feeds, their characterization, desirable properties, and selection
- How a refinery matches crude composition (assay) to product market demand by selection of process units
- Fundamentals of individual refinery processes, engineering, materials, and construction challenges
- Operational challenges
- How to improve profitability by debottlenecking, yield improvement, and blending
- How to evaluate alternative processing schemes and what makes a regional 'Pacesetter' refinery

ABOUT THE COURSE
This basic course shows how any crude oil is converted to products based upon the demand for premium quality gasoline, diesel, lubes, and chemical feedstock. It is useful for those new to the refining business such as new hires of any discipline, transferees from other sectors of the petroleum, upstream, mid-stream, and chemical sectors. This course is excellent for experienced operators who want to understand the 'why' as much as the 'how' of refining. Basics of refining and its technology are stressed. Details of chemistry, process conditions, and materials are described where necessary to support the basics. The backbone of the course is to develop a refinery processing scheme through a series of simple, linked student-worked problems. This will show how a processing scheme to meet product qualities and volumes is developed.

COURSE CONTENT
- Refining industy climate, background and driving forces
- Crude oil distillation processes: atmospheric and vacuum
- Straight-run naphtha processing, treating, isomerisation and reforming for gasoline production
- Distillate desulfurization for diesel and heating oil production
- Light-ends recovery and treating of liquefied petroleum gas (LPG) for gasoline blending and sales
- Vacuum gas oil conversion, catalytic feed hydrotreater (CFHT), fluidized catalytic cracking (FCC) and hydrocracking
- Light olefin streams recovery, treating and alkylation for gasoline
- Residue processing, residue fluidized catalytic cracking (RFCC), ARVDS, VRDS, residue hydrocracking, delayed and continuous coking
- Lube oil production
- Aromatics recovery and re-arrangement to make benzene, toluene, ethyl-benzene and xylene (BTEX)
- Product blending to make gasoline, diesel, heating oil, and fuel oil
- Refining economics

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Refinery Gas Treating, Sour Water, Sulfur and Tail Gas (RF-61)



INTERMEDIATE - 5 DAYS

DESIGNED FOR
Personnel in the gas treating, sulfur recovery and environmental conservation areas of the petroleum refining business including managers, process engineers, and operators.

YOU WILL LEARN
- Safety concerns with handling H_2S and H_2S rich streams
- Composition of typical refinery sour gas and acid gas feeds and their characterization
- The different types of amines: advantages and disadvantages
- How to select an amine from the various types available and calculate amine circulation rates required
- How to select a sour water processing scheme
- How to select sulfur recovery unit configuration
- About the economics of tail gas treatment plant selection to meet legislation
- Individual processes, engineering, materials, and construction challenges
- How to handle the operation of units, interaction and challenges encountered
- How to maximize reliability
- How to increase sulfur removal and recovery by debottlenecking, changing solvents, and sulfur plant oxygen injection

ABOUT THE COURSE
This is an intermediate, five-day course with an established, successful format that has been delivered worldwide to refinery and natural gas process engineers and managers. Practical acid gas removal, sour water stripping, and sulfur recovery processes are stressed. Details of chemistry, process conditions and materials are described as required to assure a real understanding of the processes and their materials, construction, and operational issues. To ensure that participants return to their workplace with enhanced ability and understanding, a large portion of the course includes participant discussions and problem solving.

COURSE CONTENT
- Source and compositions of refinery sour gas and sour water streams
- Types of sulfur compounds and ammonia and their affects on treating, stripping, and sulfur recovery
- Gas treating with amines – Acid Gas Removal Unit (ARU)
- Sour water stripping (SWS)
- Elemental sulfur recovery – Sulfur Recovery Unit (SRU)
- Tail gas treating – Tail Gas Unit/Tail Gas Clean-Up (TGU /TGCU)
- Incineration

For schedule and pricing information or to arrange an In-House session of this course, visit our website at www.jmcampbell.com or contact us at jmcsupport@jmcampbell.com.

Contracts and Tenders Fundamentals (SC-41)

FOUNDATION - 3 DAYS

DESIGNED FOR

Individuals involved in any aspect of sourcing, tendering, selecting, forming and executing contracts with suppliers of goods and services to the oil and gas industry. This includes supply chain roles such as contracting and procurement specialists, sourcing specialists, category managers, and logistics managers. The course is also intended for technical roles assigned to project work such as facilities engineers, drilling engineers, project engineers and coordinators, commissioning engineers, contracts engineers, planning engineers, asset managers, and legal trainees.

YOU WILL LEARN

- How to better manage project and legal risks in the contracting process.
- Key similarities and differences of the legal systems in global contracting.
- The key steps to avoid or successfully manage disputes and contract performance issues.
- How to initiate the tendering process and what is required in a tender package.
- How progress payments, currency terms and transportation terms can manage cost risks.
- How to identify the appropriate contracting strategy associated with fixed price and cost reimbursement contracts to minimize financial risks and contract costs
- The variety of pricing models used in supplier proposals and what strategies may be used to achieve fair market pricing outcomes.
- The difference between cost and price analysis and how to use each technique to evaluate a proposal
- How to more effectively use appropriate terms and conditions and some of the most common mistakes made today.

ABOUT THE COURSE

Contracts and Tenders Fundamentals will provide attendees with a more strategic approach to contracting, along with numerous tools to use throughout the contracting process. When you leave this course, you will improve job performance through: 1) better alignment of contract process steps with supply needs; 2) better contracts; 3) fewer disputes and claims; and 4) better contract outcomes. Contracting involves many roles that must work together to achieve desired outcomes. Everyone involved in some element of contracting must understand the entire process, keys to success and what is required of their role. Materials and exercises are built around oil and gas industry issues to be more relevant to the needs of attendees.

COURSE CONTENT

· Overview of the contracting process · Key issues in forming a contract in the oil and gas industry · Establishing risk management priorities throughout the contracting process · The legal environment and best use of legal counsel in contracting · Avoiding and managing contract disputes in a challenging industry · The tendering process and key documents in the tender package · Buyer and seller pricing objectives to consider when tendering · Tools used in tendering to address financial key risks · Types of contracts and examples of industry applications · Making better use of economic price adjustment clauses in place of lump sum agreements · Bid evaluation and award considerations including price/cost analysis · Key contract terms and conditions for oil and gas Industry · Using a formal contract change control process

2013 SCHEDULE AND TUITION

HOUSTON
19-21 MAR 2013 . . . . . US $2,471

ORLANDO
15-17 OCT 2013 . . . . . US $2,471

HOUSTON
5-7 NOV 2013 . . . . . US $2,471

Effective Materials Management (SC-42)

FOUNDATION - 3 DAYS

DESIGNED FOR

Professional and management personnel who have responsibility for, materials, spare parts and supplies needed to support any refinery, gas plant, onshore/offshore production or other industry operations. Buyers, procurement specialists, stock analysts, and logistics, warehouse, distribution or operations supervisors will benefit from this course by learning the techniques and principles for providing better service to their operations, reducing stock outs and surplus materials and maximizing the return on investment for inventory.

YOU WILL LEARN

- How to provide better customer service for long lead or critical materials and spare parts essential to the success of any well field operation, offshore platform, refinery, gas plant or chemical processing facility
- How to establish the best methods of inventory analysis and create performance measures for min/max and order point systems
- The most useful inventory classifications, stocking levels and safety stock calculations
- How the decision to stock can be made more effectively to avoid surplus materials
- How to use supplier stocking programs, consigned inventory and integrated supply agreements.
- How inventory systems use forecasting techniques and what can be done to improve them
- How to improve warehousing efficiency, layout and space utilization for better inventory management
- How to establish improvement goals for fewer stock outs, higher inventory turnover and reduced obsolescence
- How to improve inventory record accuracy and physical control of materials to lower inventory levels and increase space utilization
- Best practices used to manage surplus or inactive assets and increase investment recovery dollars.

ABOUT THE COURSE

This 3-day course covers practical considerations essential to achieve major improvements in planning, buying, storing and disposing of the vast array of materials and spare parts needed in the oil and gas industry. Evolving best practices by major oil and gas companies are explored as three inter-related modules for inventory management, warehousing and investment recovery.

COURSE CONTENT

- Setting comprehensive inventory goals & objectives
- Understanding carrying costs and economic order quantity theory
- Improving Material identification and coding
- Segmenting inventory for analysis
- Using formal procedures for making the decision to stock
- Determining safety stock levels and order points
- Improving Min/max systems and settings
- Understanding and using material forecasts
- Establishing a warehouse scorecard
- Creating best practices in the physical control of materials
- Measuring record accuracy and improving cycle counting systems
- Increasing the use of warehouse technologies
- Improving warehouse safety and security
- Setting up an investment recovery program
- Preventing and reducing surplus materials
- Understanding Investment recovery techniques
- Using the disposition value chain for investment recovery

2013 SCHEDULE AND TUITION

HOUSTON
1-3 OCT 2013 . . . . . US $2,471

Inside Procurement in Oil & Gas (SC-61)

INTERMEDIATE - 3 DAYS

DESIGNED FOR

Supply chain professionals with 2-7 years experience either inside or outside the oil and gas industry. The course is for anyone who needs a better understanding of procurement value creation in the oil & gas industry and includes buyers, procurement specialists, logistics specialists, business analysts, team leaders, project managers, commodity managers, materials managers, and new sourcing specialists or category managers. This course has been designed in collaboration with major oil companies to increase procurement competencies that are most relevant to the industry today.

YOU WILL LEARN

- How the industry is structured including host country and strategic relationships
- Business drivers and interface issues to be supported by procurement in an environment of increasing joint operations and shifting relationship models around the globe.
- The role of industry economics in dictating procurement good practices in cost management.
- Industry global compliance needs and how procurement can add value in meeting them.
- How the industry is modeled in the E&P (upstream), midstream and downstream value chains.
- The E&P Asset Management Cycle and Total Cost of Ownership (TCO) concepts as it relates to the oil and gas industry.
- Characteristics of supply markets to oil and gas and the emphasis on market intelligence practices and managing supply risks.
- What constitutes effective procurement/supply chain metrics for performance improvement
- Procurement challenges unique to the industry including global sourcing, local content requirements, and the growth of eCommerce.

ABOUT THE COURSE

This course will expand the industry understanding of supply chain professionals and increase their value-added in a global, fast changing environment. Participants will learn what each industry segment requires from procurement and be given insights to maximize value delivery and increase their contribution to any business unit of the organization. Course registration includes an online, interactive forum with the instructor and pre-read materials designed to familiarize course attendees with relevant issues prior to the learning that will occur in the classroom. Attendees will leave better prepared to create and support procurement strategies that meet stakeholder needs whether for projects or operations support.

COURSE CONTENT

- Industry overview for procurement including host country and strategic relationships · Key business drivers and interface issues between projects (CAPEX) and operations (OPEX). · Procurement's role in Oil and gas value chain management – upstream, midstream and downstream · The E&P asset management cycle and total cost of ownership (TCO) · Economics of oil and gas that drive procurement value creation · Industry regulatory and contractor safety compliance issues that impact procurement · Industry market intelligence practices in procurement · Industry spend analysis characteristics and needed strategies · Creating industry category management (sector) strategies · Key procurement and supplier performance metrics · Trends in global sourcing and local content requirements · Oil and gas law and global contracting risks · The influence of eCommerce and eProcurement initiatives in oil and gas

2013 SCHEDULE AND TUITION

HOUSTON
27-29 AUG 2013 . . . . . US $2,471

PetroSkills®

E&P | HSE | O&M

In addition to the courses in this training guide, PetroSkills offers a full collection of unique competency-based training programs for the Exploration & Production; Health, Safety, Environment; and Operations & Maintenance sectors of the industry. Courses in the following disciplines are offered publicly and on an in-house basis for 2013.

Exploration & Production

- Geophysics
- Geology
- Production & Completions Engineering
- Petrophysics
- Reservoir Engineering
- Project Management
- Petroleum Business
- Petroleum Professional Development
- Well Construction/Drilling

Health, Safety, Environment

- Health, Safety, Environment

Operations & Maintenance

- O&M Production
- O&M Electrical

For full descriptions, schedules, and pricing for all courses in these disciplines, as well as the courses listed on the following pages, visit our website at **www.petroskills.com** or contact us at **training@petroskills.com, +1.918.828.2500 or 1.800.821.5933** (toll free in North America)

Basic Petroleum Technology

BPT

COURSE LEVEL: Basic

DESIGNED FOR

Secretarial, administrative, management, field support, accounting, purchasing, economics, legal, finance, human resources, drafting, land and data processing personnel, as well as investors and royalty owners.
Participants involved at the technical level of the industry, particularly engineers, technicians or others with mathematics background through basic calculus, should register for the Basic Petroleum Engineering Practices course.

YOU WILL LEARN

- Basic geology as related to oil and gas reservoirs
- Reservoir fluid and rock properties
- Basics of seismic technology
- Reservoir definition and development; production and recovery
- Unconventional gas ("tight shale" gas)
- Fundamentals of drilling, well completions and production operations
- Basic concepts of primary and enhanced recovery operations
- Surface operations
- Terminology of exploration and production (language of the oil field)

ABOUT THE COURSE

This course presents a non-technical, practical understanding of petroleum industry technology in an interesting, effective, and efficient manner. Included are the basics of the industry from terminology through basic technology and from geology through processing of the petroleum product. Participants are placed in the position of Reservoir Engineer, and "Our Reservoir" is defined, analyzed and put in production. Next, drill sites are chosen. Participants are then placed in the position of Drilling/Completion Engineer, and the drilling/completion program for "Our Well" is analyzed. Participation results in greater job confidence, enthusiasm and productivity.

Basic Petroleum Technology is ideal for staff who need to be able to understand the various aspects of oil and gas operations and speak the language of the oilfield. The first day will give an introduction to the industry and cover reservoir fluids. The next two days will include petroleum geology and reservoirs, and introduce exploration technology. The fourth day will get into drilling engineering, operations, and well completion technology. The course will wrap up with production technology, reservoir development, and surface processing.

COURSE CONTENT

- Reservoir fluid properties
- Petroleum geology
- The petroleum reservoir
- Unconventional gas ("tight shale" gas)
- Exploration technology
- Drilling technology
- Well completion and workover
- Production operations
- Recovery
- Surface processing
- Offshore operations

2013 SCHEDULE AND TUITION / 5 DAYS

ABERDEEN, U.K.	18-22 MAR	$4,185+VAT
DUBAI, U.A.E.	30 JUNE-4 JULY	$4,680
HOUSTON, U.S.	4-8 MAR	$3,635
	22-26 JULY	$3,635
	21-25 OCT	$3,635
KUALA LUMPUR, MALAYSIA	2-6 DEC	$4,260
LONDON, U.K.	8-12 APR	$4,260+VAT
	5-9 AUG	$4,260+VAT
	4-8 NOV	$4,260+VAT
PITTSBURGH, U.S.	19-23 AUG	$3,635

Available from anywhere via PetroFlex delivery

Basic Petroleum Engineering Practices

BE

COURSE LEVEL: Basic

DESIGNED FOR

Engineers, engineering trainees, technical managers and assistants, technicians, geologists, geophysicists, chemists, physicists, service company personnel, sales representatives, and data processing personnel.

YOU WILL LEARN

- Basic petroleum geology
- Reservoir fluid and rock properties
- Fundamentals of reservoir fluid flow
- Oil and gas reservoir classification, definition, delineation and development
- Unconventional gas ("tight shale" gas)
- Fundamentals of drilling, well completion, and production operations
- Basics of casing design and primary cementing
- Primary and enhanced recovery mechanisms
- Surface operations

ABOUT THE COURSE

This course is far more than an introduction to petroleum engineering and certainly is not a superficial presentation of the technology of the industry. Its purpose is to develop an understanding of the technology and its applications at an engineer's level, and the confidence and professional enthusiasm which comes with that understanding. The course has had a revolutionary effect on training programs for many major oil and service companies by making specialized training that follows far more effective. Participants enter those specialized programs with a depth of understanding of that particular technology and relation to other classic and new technologies of the industry. The course focuses on the field and application approach, and includes classroom exercises, fundamental engineering problems, and basic field exercises.

Basic Petroleum Engineering Practices will set the foundation for technical professionals with regards to technology and its engineering applications. The course starts out with a brief introduction of the history and current state of the oil and gas industry. Next, reservoir fluids, petroleum geology, and petroleum reservoirs are discussed. Then, various facets of exploration technology, drilling engineering and operations, well completion technology, and production technology are covered before finishing with surface processing of produced fluids.

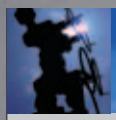
COURSE CONTENT

- Reservoir fluid properties
- Petroleum geology
- Reservoir properties and evaluation
- Unconventional gas ("tight shale" gas)
- Exploration technology
- Drilling engineering
- Well completion, stimulation and workover
- Well testing and formation damage
- Production operations
- Recovery methods
- Surface processing

2013 SCHEDULE AND TUITION / 5 DAYS

ABERDEEN, U.K.	15-19 JULY	$4,185+VAT
CALGARY, CANADA	21-25 OCT	$3,635+GST
DENVER, U.S.	12-16 AUG	$3,635
DUBAI, U.A.E.	28 APR-2 MAY	$4,680
HOUSTON, U.S.	4-8 FEB	$3,635
	15-19 APR	$3,635
	8-12 JULY	$3,635
	9-13 SEPT	$3,635
	18-22 NOV	$3,635
KUALA LUMPUR, MALAYSIA	2-6 SEPT	$4,260
LONDON, U.K.	18-22 FEB	$4,260+VAT
	2-6 DEC	$4,260+VAT
OKLAHOMA CITY, U.S.	7-11 OCT	$3,635

Available from anywhere via PetroFlex delivery



Surface Production Operations

PO3

COURSE LEVEL: Basic

DESIGNED FOR

Beginning level production, operations, facilities and petroleum engineers; production managers and field production supervisors; surface equipment technicians; and technical or supervisory personnel who interact with field facility engineers / operators

YOU WILL LEARN

- The physical properties and phase behavior of crude oil and natural gas that govern production operations
- Field processes for treating and conditioning full wellstream production for sales or final disposition
- An introduction to the wide range of equipment used to process, treat, transport, and store oilfield produced fluids
- The basics of oilfield corrosion prevention, detection and treatment
- How to determine and minimize pressure drop in pipelines, valves and pressured vessels Internal workings of separators, pumps, compressors, valves and other treating equipment
- An overview of the processes and equipment used to handle acid gases
- A basic understanding of a wide range of produced fluid volume measurement and metering devices
- A description of treating equipment whether located downhole, on the surface, offshore platform or sea floor

ABOUT THE COURSE

The purpose of this course is to present an overview and fundamental understanding of the wide range of oilfield production handling and treatment equipment. The participant should learn not only "what" but "how" field fluid treating equipment works. The fundamental principles of fluid behavior are first introduced, then applied to all of the various equipment and systems comprising production operations. Emphasis is on understanding the internal workings inside the piping, valves and vessels. A major goal of this course is to improve communication among the technical disciplines, field and office in order to enhance operational efficiencies, lower costs and improve production economics. Example step-by-step exercises are worked together with the instructor to drive home the important points. Daily sessions include formal presentation interspersed with directed discussion and problem solving.

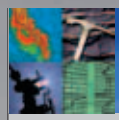
COURSE CONTENT

- **Properties of produced fluids:** Impact of pressure, temperature and fluid on key hydrocarbon parameters and fluid behavior
- **Valves:** API valves, chokes, regulators, and flow control devices; principle of operation and effect on fluid condition
- **Safety systems:** surface safety control systems; relief valves; pressure ratings; API recommended practices
- **Flowlines, manifolds and gathering systems:** material selection, pressure drop considerations, line sizing, corrosion, noise and erosion concerns, full wellstream production, two and three phase fluid flow, pigging, slugs, foam and emulsions
- **Mechanical equipment:** Pumps, compressors, heaters, sour and acid gas treating, pressured vessels, storage facilities and other surface and subsurface treating/fluid handling equipment
- **Gas separation / treating:** two and three phase separation, free water removal, treatment of emulsions, hydrate prevention and treatment, vapor recovery, gas conditioning for sales, injection or field usage
- **Oil / water separation and treatment:** two and three phase separation, emulsion breaking, asphaltenes, solids control, removal of residual oil-in-water and water-in-oil to meet pipeline specifications or injection / disposal requirements, hydrocyclones and new water / oil treating equipment
- **Fluid measurement and instrumentation:** Liquid and gas metering using positive displacement meters, orifices, sonic meters, mass measurement meters, three phase flow measurement and new metering devices
- **Acid gas treatment:** field handling and treatment of sour and acid gases, safety considerations, API standards
- **Corrosion:** fundamental principles; detection, prevention and treatment
- **Treating facility innovations:** up-to-date description of new equipment for handling high pressure/temperature, three phase flow from subsea and remote locations

2013 SCHEDULE AND TUITION / 5 DAYS

ADELAIDE, AUSTRALIA	19-23 AUG	$4,260
BAKERSFIELD, U.S	25 FEB-1 MAR	$3,635
CALGARY, CANADA	22-26 APR	$3,635+GST
DALLAS, U.S.	7-11 OCT	$3,635
DUBAI, U.A.E.	24-28 NOV	$4,680
HOUSTON, U.S.	20-24 MAY EA	$3,635
	9-13 SEPT EA	$3,635
KUALA LUMPUR, MALAYSIA	17-21 JUNE	$4,260
LONDON, U.K.	24-28 JUNE	$4,260+VAT
MIDLAND, U.S.	4-8 NOV	$3,635
OKLAHOMA CITY, U.S.	8-12 APR	$3,635

EA *Accelerated development and coaching available*



Basic Drilling, Completion and Workover Operations

BDC

COURSE LEVEL: Basic

DESIGNED FOR

Technical, field, service, support and supervisory personnel desiring to gain an introductory overview of these topics and how they interrelate. Excellent for cross-training of other technical disciplines such as reservoir and surface facility engineers plus geoscientists, and anyone who interacts with drilling, completion or workover design engineers such as technical supervisors and technical service personnel.

This is not a fundamental course for training engineers seeking a career in drilling or workovers (for these,PO1 is recommended).

YOU WILL LEARN

- How drilling, completing and reworking a well affects its ability to produce
- What can be done within open-hole and cased wells, as a part of reservoir management
- How drilling practices can damage or stimulate producing wells

ABOUT THE COURSE

This course gives a technical overview of the science and art of drilling operations, completion practices and post-completion wellbore enhancement or remedial workover techniques (well intervention). It develops an understanding of the WHAT, WHY, and HOW of each of these areas of engineering practice. Reservoir Engineers will learn what can be done within open-hole and cased wells as they execute reservoir management. Drilling and completion personnel will learn how the producing reservoir can be damaged or stimulated by what they do. The participants learn to visualize what is happening "downhole", discover what can be accomplished and gain an appreciation for wellbore risks and the possibility of damage to the formation; and how drilling and completion practices can alter reservoir interpretation and performance. The participant will become conversant with specific technical terminology and aware of practical applications, which should enhance communication and interaction between disciplines.

COURSE CONTENT

Overview of workover techniques:

- Stimulation application: surfactants, solvents, acidizing, fracturing & deep perforating
- Formation & sand control: screens, chemical consolidation, gravel packing, frac-pack, new & novel techniques
- Scale & corrosion
- Paraffin & asphaltenes
- Recompletions
- Reworks
- Sidetracking
- Deepening
- Coiled tubing

Overview of the completion process:

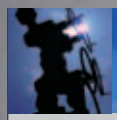
- Zonal isolation
- Tubing, packers & completion equipment
- Safety & flow control devices
- Open hole completions
- Basic completion types
- Perforating
- Open & cased hole logging
- Formation damage & treatment
- Completion fluids
- Multiple completions

Overview of the drilling process:

- Overall drilling practices
- Language of drilling
- Reservoir rock and fluid properties
- Rigs & rig equipment
- Drilling string components & design
- Bits
- Drilling fluids & hydraulics
- Rig operation
- MWD
- Well control
- Hole problems & stuck pipe
- Drilling risks
- Cores and coring
- Casing design & installation
- Primary cementing
- Directional, horizontal, multilateral & under-balanced drilling
- Wellhead & trees

2013 SCHEDULE AND TUITION / 5 DAYS

ABERDEEN, U.K.	11-15 MAR	$4,185+VAT
BAKERSFIELD, U.S	18-22 NOV	$3,635
CALGARY, CANADA	29 APR-3 MAY	$3,635+GST
DALLAS, U.S.	14-18 OCT	$3,635
DENVER, U.S.	8-12 JULY	$3,635
HOUSTON, U.S.	18-22 MAR	$3,635
	12-16 AUG	$3,635
	9-13 DEC	$3,635
KUALA LUMPUR, MALAYSIA	23-27 SEPT	$4,260
LONDON, U.K.	1-5 JULY	$4,260+VAT
MIDLAND, U.S.	3-7 JUNE	$3,635



Production Operations 1

P01

COURSE LEVEL: Foundation

DESIGNED FOR

Petroleum engineers, production operations staff, reservoir engineers, facilities staff, drilling and completion engineers; geologists; field supervisors and managers; field technicians, service company engineers and managers, and, especially engineers starting a work assignment in production engineering and operations or other engineers wanting a firm foundation in production engineering.

YOU WILL LEARN HOW TO

- Gain insight into typical geological models
- Design and properly select well completion mechanical equipment
- Evaluate the flow capacity of a well
- Achieve successful well casing primary cementing and remedial casing cement repair techniques
- Select equipment and engineer alternate methods for perforating operations in varied down hole well environments including underbalanced procedures
- Utilize alternate well intervention techniques of applied wireline operations and coiled tubing methods
- Recognize harsh well producing environments leading to potential corrosion and erosion failure, scale formation, and related downhole deposits
- Choose proper wellbore completion and workover fluids, fluid solids control, and fluids filtration standards and best practice methods
- Distinguish the characteristics and types of mechanical artificial lift systems
- Ascertain why and how formations become damaged and how to interpret, prevent, and correct reservoir damage
- Collect data to categorize options to choose an optimum well stimulation plan
- Understand the causes of and the best approach to managing sand production
- Understand how to properly acidize a carbonate or a sandstone reservoir
- Understand the proper use and effects of surfactants and their presence in the oilfield in order to benefit from their use and avoid problems mis-application
- Manage organic paraffin and asphaltene field deposits in tubing and surface facilities
- Understand modern fracture stimulation and productivity improvement
- Choose proven technology for cased hole production logging tools and interpretation methods
- Select mechanical and / or permeability altering chemical methods to attempt downhole water shut off
- Recognize, prevent, and manage corrosive conditions and typical common soluble and insoluble scales
- Apply technologies including: expandable tubulars and screens, intelligent well completions, wellbore fiber optic data gathering and transmission, interval control valves, multi-lateral completions, and elastomer swellable tubulars

ABOUT THE COURSE

The Production Operations 1 course represents the core foundation of PetroSkills' production engineering course curriculum and is the foundation for future studies in the discipline. The participant will become familiar with past proven, and, newer technologies, procedures, and techniques to improve and increase oil, gas, and condensate production. The entire course structure applies a proven methodology, least cost, integrated methods approach that allows engineers to make careful and prudent business decisions. The PO1 course is one of PetroSkills' most popular.

COURSE CONTENT

Importance of the geological model • Reservoir engineering fundamentals in production operations • Well testing methods applicable to production operations • Understanding inflow and outflow and applied system analysis • Primary and remedial cementing operations • Well completion design and equipment • Completion and workover well fluids • Perforating design and applications • Production logging • Artificial lift completions • Problem wells • Formation damage • Acidizing • Corrosion control • Scale deposition, removal, and prevention • Surfactants • Paraffin and asphaltenes • Sand control • Hydraulic fracturing

2013 SCHEDULE AND TUITION / 10 DAYS

ABERDEEN, U.K.	8-19 APR	$7,525+VAT
BAKERSFIELD, U.S	21 OCT-1 NOV	$6,560
BOGOTA, COLOMBIA	22 JULY-2 AUG.	$6,730
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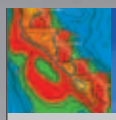

Basic Reservoir Engineering

BR

COURSE LEVEL: Basic

DESIGNED FOR

Geologists, geophysicists, engineers, engineering trainees, technical managers, technical assistants, technicians, chemists, physicists, technical supervisors, service company personnel, sales representatives, data processing personnel, and support staff working with reservoir definition, development and production.

YOU WILL LEARN

- The fundamentals of fluid flow in porous media
- How reservoirs are characterized by fluid type and drive mechanisms
- The basis for reservoir fluid distribution
- About oil and gas well performance and pressure buildup analysis
- About oil displacement and optimizing reservoir performance
- The basics of enhanced oil recovery
- How oil and gas in place can be estimated and recovery predicted

ABOUT THE COURSE

The intent of *Basic Reservoir Engineering* is development of a more complete "understanding" of the characteristics of oil and gas reservoirs, from fluid and rock characteristics through reservoir definition, delineation, classification, development plan, and production. Data collection, integration and application directed toward maximizing recovery are stressed. Basic reservoir engineering equations are introduced with emphasis directed to parameter significance and an understanding of the results. 3-D and 4-D seismic concepts are introduced. For nearly 30 years this has been one of our most popular and successful courses.

The first day of the course includes an discussions on reservoir geology, an overview of drilling and production, reservoir properties, and PVT. The next two days cover rock properties, original oil in place, relative permeability, reservoir and drive mechanisms, well testing, and fluid flow in radial systems. The fourth day goes over inflow/outflow performance, pressure maintenance and recovery efficiency, optimizing reservoir performance, waterflooding and enhanced oil recovery, material balance, and decline curves. The course wraps up on the last day with gas reservoirs and reservoir development planning.

As part of the Basic Reservoir Engineering course, there are class exercises designed to be solved by hand with a calculator. For those that prefer to use spreadsheets to do the calculations, participants are welcome to bring their own laptop computer.

COURSE CONTENT

• Reservoir fluid properties • Coring practices and rock properties • Fundamentals of fluid flow • Reservoir fluid distribution • Reservoir classification • Reservoir drive mechanisms • Oil and gas well performance • Pressure buildup analysis • Oil displacement concepts • Estimation of oil-in-place and gas-in-place • Recovery

2013 SCHEDULE AND TUITION / 5 DAYS

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8th Edition, 3rd printing, February 2004, 440 pages, ISBN 0-9703449-0-2

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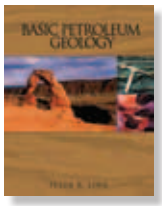

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Peter K. Link

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Tip of the Month

The classroom is not the only way to learn from John M. Campbell & Co.'s expert instructors. Our instructors share their valuable technical knowledge monthly to address current issues in the oil and gas industry through our Tip of the Month. The Campbell Tip of the Month is available FREE by subscribing at www.jmcampbell.com/TOTM.

Below are some of our most popular Tips of the Month, for the full archives visit: www.jmcampbell.com/TOTM

MEG INJECTION VS. TEG DEHYDRATION – MARCH 2007

By: Harvey M. Malino and Mark Bothamley

In this "Tip of the Month", we will focus on the question of: Which technology should you choose? The answer, of course, is "It depends." It depends on what you are trying to accomplish, the constraints imposed on your system and the relative economics.

A Rule of Thumb is "Use MEG injection if you have to cool the gas for NGL recovery anyway." Like all Rules of Thumb, there are exceptions. But let's explore the basics of each technology.

FRICTION PRESSURE DROP CALCULATION – FEBRUARY 2007

By: Joe Honeywell

Engineers are frequently asked to calculate the fluid pressure drop in a piping system. Many software programs are available for solving complicated hydraulic problems; however they can be complex and difficult to use. In addition, there are many tables or shortcut methods that give adequate answers but they usually apply to predefined conditions which are sometimes misleading or less accurate. This "Tip of the Month" discusses a method of calculating friction pressure losses for liquid lines. A spreadsheet is presented that gives friction losses based on this method.

COMPRESSOR CALCULATIONS: RIGOROUS USING EQUATION OF STATE VS. SHORTCUT METHOD – NOVEMBER 2011

By: Mahmood Moshfeghian

In this tip of the month (TOTM) we will present the compressor calculations of a case study. We will compare the rigorous method results with the values from the short cut methods. The rigorous method is based on an equation of state like the Soave-Redlich-Kwong (SRK) for calculating the required enthalpies and entropies. The enthalpies and entropies are used to determine the power requirement and the discharge temperatures. The results indicate that the accuracy of the shortcut method is sensitive to the value of heat capacity ratio, k.

To learn more about these tips and past Tips of the Month, visit JMC Tip of the Month at http://www.jmcampbell.com/TOTM.

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Our Instructors

FRANK ASHFORD

DR. FRANK ASHFORD has 40 years experience in oil and gas producing facilities. Dr. Ashford joined with John M. Campbell & Co. in 1988; he provides instruction fluently in either Spanish or English. Previous to joining John M. Campbell & Co., Dr. Ashford was a Professor at Central University of Venezuela, Caracas, Venezuela, where he taught various courses in Natural Gas Engineering Technology. He has authored technical articles published in World Oil, JPT, SPE, Intevep Pub., PDVSA, Pacific Oil World, AAPG, SPELAC, and GPA. He holds a B.S., a M.S. and a PhD in Petroleum Engineering from the University of Oklahoma.

JOHN BARR

MR. JOHN BARR has over 30 years experience of working in the pipeline and storage industries, holding senior project engineering positions with responsibilities for multi-disciplined design projects as a senior consultant and project manager. In addition to conceptual studies, FEED and detailed design projects for pipelines, project activities have also included, oil and gas field development, pipeline and installation rehabilitation, on-line inspection, materials procurement and construction activities, for both proposed and operational pipeline systems. John has been involved with international projects, including Algeria, Azerbaijan, Egypt, Georgia, Norway, Poland, Syria, Tanzania, Tunisia, Turkmenistan, Russia (FSU), UAE, UK and Yemen. He is based in the UK and is a Chartered Member of the Institute of Gas Engineers and Managers.

JAMES BEASLEY

MR. JAMES BEASLEY has over 40 years of experience in project management, engineering, and construction management of pipeline systems and military facilities. Mr. Beasley joined Butler Associates, Inc., the predecessor company of Willbros Engineers (U.S.), LLC, in 1973 as a Project Manager. He was named Vice President and Manager of Projects in 1981. In 1984, Mr. Beasley became Executive Vice President and Chief Operating Officer, and in 1986 was promoted to President and Chief Operating Officer, a position he held until August 2003. In 2001, Mr. Beasley was given additional responsibilities as Senior Vice President of Willbros USA, Inc., the parent company of Willbros Engineers (U.S.), LLC. Mr. Beasley is a member of Tau Beta Pi and Chi Epsilon and a former member of the American Society of Civil Engineers and Project Management Institute. He received M.S. and B.S. degrees in Civil Engineering from the University of Missouri.

GARY BLACKBURN

MR. GARY BLACKBURN is President of John M. Campbell Consulting. He has over 40 years of experience in engineering and management of oil and gas developments. During his 27 years with Shell Oil Company, he managed drilling, production and construction engineering and operations in the Gulf of Mexico, Texas, Oklahoma, Kansas and Alaska. While working in ABB's Floating Production System's Division, Gary led engineering teams designing deepwater systems, naval architecture, structural, topside facilities, drilling systems and floating system hulls. After an assignment as the ABB's Project Manager for ExxonMobil's Kizomba A TLP, he was assigned as ABB's Vice President - Project Execution. In this role, he was responsible for oversight of ongoing projects and development of new processes for EPC project execution. After leaving ABB, Gary provided consulting services for drilling systems selection and producing operations management to several major operators.

ROBERT BOMBARDIERI

MR. ROBERT BOMBARDIERI has almost 30 years' in the oil and gas industry. His expertise includes process engineering, operations, business development and project general management. A portion of his experience includes process engineering in various types of gas process plants in Canada, USA and Sharjah where he designed, project managed and lead numerous modifications that increased plant operating economics via increasing availability, NGL recovery, sulfur recovery, plant throughput, molecular sieve performance, safety, and process operations. A piece of his leadership experience includes identifying the need for a Process Safety Management and arranging for institutionalizing a PSM system for a major facility. Mr. Bombardieri coauthored a paper on molecular sieve dehydration that was selected 'Best Paper Award' at the 2008 Gas Processor's Association annual convention and subsequently published in the Oil and Gas Journal. He has an M.B.A. from Tulane University and a B.Sc. in Chemical Engineering from the University of Alberta.

MARK BOTHAMLEY

MR. MARK BOTHAMLEY is Chief Engineer with John M. Campbell & Co. His experience covers the areas of design, operation, troubleshooting and optimization of offshore and onshore oil and gas production and treating facilities. Prior to joining JMC he was with BP/Amoco for 24 years, in several locations around the world. Mr. Bothamley is a past chairman of the SPE Facilities Subcommittee and a former member of the GPSA Data Book Editorial Review Board. Mr. Bothamley holds a B.S. in Chemical Engineering from Lakehead University in Thunder Bay, Ontario, Canada, and a Diploma in Natural Gas and Petroleum Technology from the British Columbia Institute of Technology in Vancouver, B.C. Canada.

JOHN C. BOURDON

MR. JOHN C. BOURDON has more than twenty-nine years experience in hydrocarbon processing and specializes in sulfur recovery processes for the petroleum refining industry. Mr. Bourdon has been involved in the development of several sulfur-related technologies and mechanical innovations, has authored several papers and made presentations worldwide. He has experience with several E&C firms including extensive start-up and troubleshooting activities. He consults for both North American and international clients. He is a registered professional engineer and is fluent in English and Spanish. Mr. Bourdon has a B.S. in Chemical Engineering from the Georgia Institute of Technology and advanced degrees in other fields.

LUIS BRITO-PINO

MR. LUIS BRITO-PINO has more than 19 years of experience working for the Oil Refining, Gas & Petrochemical Industries, and also for the Engineering & Design firms for those same sectors. During that time, he has held several technical engineering and mid-level management positions, including Optimization & Planning Superintendent for one of the Venezuelan Orinoco Belt Extra Heavy Oil Upgraders (SINCOR). Mr. Brito has lived and worked in Caracas, Maracaibo, Puerto La Cruz (Venezuela), Puebla (Mexico), Madrid (Spain) and recently in Adelaide (Australia). He is currently based in Whyalla (South Australia, Australia), where he works for an Australian company within the Oil & Gas sector. Mr. Brito earned a Master of Science degree in Oil Refining, Gas & Petrochemical from the Institute Francois du Petrol (IFP) and a BS in Chemical Engineering from Simon Bolivar University in Caracas, Venezuela.

PAUL A. CARMODY

MR. PAUL A. CARMODY has more than 34 years of experience in the petroleum industry. During his 32 years with Hess Corporation and its predecessor, Amerada Hess Corporation, Mr. Carmody has been involved in nearly all aspects of oil and gas engineering from the reservoir sand face through the outlet of gas plants. He is a registered Professional Engineer in North Dakota where his experience includes Bakken oil development, production engineering, pipelines, and compressor station installations. West Texas experience includes CO_2 EOR flood gas gathering, CO_2 pipelines, and gas plant engineering. His gas plant experience includes three expansions of a CO_2 Gas plant, cryogenic gas plants, and lean oil plant processes where he has supplies process and design engineering services. He has served as a board member of the CO_2 Conference in Midland. He recently retired in order to devote himself to providing technical instruction through J.M. Campbell and Company and advancing upstream facilities technology through J.M. Campbell Consulting. Mr. Carmody graduated from the University of Connecticut with a degree in Mechanical Engineering.

AJEY CHANDRA

MR. AJEY CHANDRA has 25 years experience in the energy industry, primarily in gas processing, transportation and market analysis. During his time in the industry he has served in a variety of roles in operations management and consulting activities. Mr. Chandra was a Senior Principal in the consulting firm of Purvin & Gertz, Inc. He has worked on a variety of assignments in the areas of market analysis, forecasting, gas processing and transportation costs. He has served in managerial roles for multiple gas processing facilities in multiple regions around the world and holds a B.S. in Chemical Engineering from Texas A&M University, and an M.B.A from the University of Houston.

Our Instructors

JIMMY CLARY

MR. JIMMY CLARY has 25 years of experience in the Hydrocarbon Processing Industries. During his 17 years with RWD Technologies, he held technical and management positions including Senior Training Analyst, Project Manager and Team Leader. Mr. Clary has lived and worked in Los Angeles, California and Houston, Texas; completing projects in Asia, Africa and North and South America. He is currently based in Houston where he also worked for Petroleum Testing Services and NPR services in Special Core Analysis, Fluid Analysis and Amine reclamation areas. Mr. Clary earned a B.A. in Mathematics and a B.S. in Physics from the University of Oklahoma.

MICK CRABTREE

MR. MICK CRABTREE has spent the last eight years running industrial workshops throughout the world in the fields of: Process Control and Instrumentation; Data Communications; Fieldbus; Emergency Shut-down Systems; Project Management; On-Line Analysis; and Technical Writing and Communications. He has trained over 5,000 engineers, technicians and scientists. Mr. Crabtree formerly trained in aircraft instrumentation and guided missiles in the Royal Air Force, having completed his service career seconded to the Ministry of Defense and he was responsible for ensuring the reliability, maintainability and functional usefulness of specific equipment entering the RAF. He is the former editor and managing editor of Pulse magazine, South Africa's leading monthly journal dedicated to the general electronic and process control instrumentation industries. He has written and published six technical handbooks on industrial process control. Mr. Crabtree holds a M.Sc. (Research) in Industrial Flow Measurement and an HNC in Electrical Engineering (with distinctions).

PIERRE CREVIER

MR. PIERRE P. CREVIER worked in operations, design and business development functions across Canada prior to joining Saudi Aramco in 1992. As a member of the Upstream Process Engineering Division in Dhahran he provides process consultancy to the company's gas plants and refineries. Over the last 15 years he has led the company's efforts in addressing chronic Claus catalyst deactivation caused by aromatic contaminants. Mr. Crevier earned B.Sc. and M.Sc. degrees in Chemical Engineering from the University of Waterloo in 1980 and 1987 respectively.

JOHN R. CURRY

MR. JOHN R. CURRY is a recognized authority on the ASME Boiler and Pressure Vessel Code, pressure vessel design, fabrication and metallurgy. He founded and was President of Gulfex, Inc. for more than 37 years. This firm is a major producer of pressure vessels for the refining, natural gas, oil production and petrochemical industries. Since 2003, he has been a lecturer on Section VIII, Div.1 of the Code teaching engineers worldwide on pressure vessels. He consults in the field of upgrading and rerating existing pressure vessels for new service. He continues to be a volunteer for the Boy Scouts of America promoting high adventure programs for older scouts. He has been teaching Biblical History for over 25 years. After completing his mechanical engineering training, he completed an MBA from the University of Texas at Austin. He spent two years in night school studying metallurgy at Rice University.

RALPH DARTEZ

MR. RALPH DARTEZ has over 30 years of engineering and management experience. He has led engineering, construction, operating and field development and management teams in the Gulf of Mexico, Alaska Cook Inlet and UK North Sea for Marathon Oil Company. Mr. Dartez was Marathon Oil Company's Gulf of Mexico Region Manager during the mid 1990s at the time a number of deepwater fields were discovered and developed including Troika (2700' water depth), Oyster (1000' wd), Arnold (1700' wd), Petronius (1800' wd) and Camden Hills (7100'wd). He has experience with drilling and completions, design, construction and reservoir management of deepwater and particularly sub-sea developments.

ARTHUR DELARGY

MR. ARTHUR DELARGY has over 15 years experience in Process Design/Consultancy, Field Development Planning and Process Systems engineering. Technologies he has worked with include Nitrogen Rejection, CO/H2 Coldbox technology, LNG, Gas Processing including dehydration/dewpointing, sweetening and NGL/LPG extraction, ammonia, heavy oil and various oil refining processes, as well as both on and offshore oil and gas experience. The scope of his project work has ranged from proposal preparation and field development planning to engineering design and HAZOP studies to troubleshooting on an operating plant. He holds a Masters degree in Chemical Engineering (Honors.)

KRIS DIGRE

MR. KRIS A. DIGRE has over 36 years of experience working in locations around the world. He has designed or been involved with the design of offshore structures located off the coast of West Africa, Alaska, Australia, Brazil, Borneo, California, China, Egypt, the Gulf of Mexico and the North Sea. He has been involved in the technical specification development and/or installation of all of deepwater Tension Leg Platforms (TLP) and a Floating Production System (FPS) in the Gulf of Mexico and an FPSO offshore Nigeria. Mr. Digre remains active in retirement providing advice to E&P project groups on various Nigeria FPSO projects. Mr. Digre is a graduate (BSCE) of Illinois Institute of Technology and a Licensed Professional Engineer in New Jersey, Louisiana, Texas and California.

BILL DOKIANOS

MR. WILLIAM (BILL) DOKIANOS has over 35 years' experience, primarily in Mechanical and Process Engineering. His experience includes assignments in operations, project execution, technical support and engineering management; both onshore and offshore. Mr. Dokianos has been involved in analyzing and solving poor platform up time for both shallow water and deep water platforms. Activities included process control changes due to stacked separator vessels, revising safe charts, operating settings and reconfiguration of pipeline export pumps. He managed a subsea tieback project in which the platform modifications included high pressure vessel redesign, dehydrator expansion, adding vapor recovery units, restaging high pressure and intermediate gas compressors and modifying bulk oil process design. His pipeline experiences include responsibility for DOT compliance activities and reporting, the development and implemtation of federal risk programs and smart pigging, pipeline construction and control center management. Mr. Dokianos holds a B.Sc. in Electrical Engineering, Wayne State University, Detroit, MI. He is a Professional Engineer in Louisiana and New Mexico and holds a General and Commercial Contractor License in New Mexico.

ROBERT FANNING

MR. ROBERT FANNING has held various Process Engineering and Management positions in his 26 years with Mobil. Mr. Fanning's background includes general oilfield facilities, water flood facilities, CO2 flood facilities, NGL recovery, and LNG. Mr. Fanning was on the Board of the Permian Basin Chapter of the GPA for several years and is a past President of the chapter. He received his B.S. in Chemical Engineering from the University of Wyoming and is a Registered Professional Engineer in the state of Texas.

WOLFGANG FOERG

MR. WOLFGANG FOERG has over 20 years' experience in plant system design, control system design and selection, procurement, engineering management, and installation and commissioning of vendor proprietary equipment. His experience includes assignments as project engineer, rotating equipment specialist, lead engineer for major EPC contractors, as well as experience in construction, module design, commissioning and startup of plants. The types of plants include air separation plants, gas plants, gas storage facilities, power generation, MTBE plants, refinery wastewater treatment facilities, phenol plants, polypropylene plants, crude oil treating facilities and crude oil pipelines, LNG/NGL liquefaction plants, and LNG receiving terminals. Specific equipment experience includes gas turbines, steam turbines, cryogenic expanders, centrifugal compressors, reciprocating compressors, centrifugal pumps, positive displacement pumps, polymer extruders, refrigeration systems, diesel engines, motors, generators, dryers, chemical injection systems, cooling towers, boilers, and loading arms. Mr. Foerg holds a M.S., Mechanical Engineering from Stevens Institute of Technology and a B.S., Mechanical Engineering from Cornell University. He is a Registered Professional Engineer in Wyoming, Colorado, Alberta, and Texas and is a CCHEST Safety Trained Supervisor (STS).

Our Instructors

WILLIAM E. FORSTHOFFER

MR. WILLIAM (BILL) E. FORSTHOFFER is a graduate of Bellarmine College, Louisville, Kentucky, where he received his Bachelor of Arts degree in Mathematics. Bill continued his studies at the University of Detroit, Michigan, where he received a Bachelor of Science degree in Mechanical Engineering. Bill spent six years at the Delaval Turbine Company, where he designed and tested centrifugal pumps and compressors, gears, steam turbines and rotary (screw) pumps. Prior to leaving Delaval, Bill held the position of Manager of Compressor Projector Engineering responsible for the aerodynamic and mechanical design of centrifugal compressors, lube and seal systems and auxiliaries. Bill joined Mobil Research and Development Corporation (MRDC) in Princeton, New Jersey in 1974, where he was directly involved with rotating equipment selection, design, testing and start-up of fluid cat cracker units, reformers, hot gas expanders and low density polyethylene plants. From 1980 to 1985, Bill directed the application, selection, design, testing, site pre-commissioning and start-up of the Yanbu Petrochemical Complex in Yanbu, Saudi Arabia. Following his overseas assignment, Bill returned to MRDC where he established a Technical Service Program for Mobil affiliates to provide application, trouble-shooting and training services for rotating equipment. Bill left Mobil in January of 1990 to found his own company. Since then, Forsthoffer Associates, Inc. (FAI) has provided quality training, critical equipment selection and trouble-shooting services to the refining, petrochemical, utility and gas transmission industries on a worldwide basis. In 2011, FAI joined with John M. Campbell & Co. to provide two new public courses, namely, ME-47 Rotating Machinery Best Practices (see page 35) and REL-41 Rotating Equipment Reliability Optimization (see page 36).

ALAN FOSTER

MR. ALAN FOSTER spent 25 years with Petrolite Corporation and Baker Petrolite involved in oilfield and refinery operational problems and their resolution by chemical treatment programs. Mr. Foster has developed and taught courses on oilfield water treatment and oilfield corrosion control since 1978. Other courses included oil demulsification, paraffin and asphaltenes, oilfield microbiology (and MIC) and refinery technology. He was also qualified by the original training company in its field to teach their project management course. He has been a Chartered Chemist and Member of the Royal Society of Chemistry for over 25 years and was also a Fellow of the Chartered Institute of Personnel and Development. Mr. Foster received his B.S. in Applied Chemistry from Portsmouth Polytechnic (UK) and his MBA from Leeds University. He is based in the United Kingdom.

RONALD FREND

MR. RON FREND has almost forty years of engineering, consulting and management experience starting his career with Shell Tankers (UK) as an engineer officer cadet through to chief engineer, then taking up a maintenance engineering position in Oman rising to a senior management position in Shell International (Middle East) before opening an engineering consultancy in 1989. His entire career has been concerned with practical applications of maintenance, operations and engineering. Ron is experienced in a variety of engineering and maintenance analytical techniques as well as possessing management skills suitable to an engineering consultancy and a large multi-national corporation. Highlights of Ron's career include centrifugal compressor optimization of surge control systems, introduction of enveloped demodulation vibration analysis techniques and development of a methodology to calculate U and R values based on infrared thermal imaging measurements. Ron is currently based in Blackpool, England where he is managing director of his own consultancy. He is a registered engineer with a M.Sc. from Huddersfield University in England as well as being a certified Chief Engineer Officer (marine).

JOSH GILAD

MR. Y. (JOSH) GILAD, P.E., has forty years of domestic and international experience in the engineering, analysis, inspection, troubleshooting, forensic investigation and expert witness for marine liquid bulk terminals for oil (crude, products) and gas (LNG, LPG), cargo handling and storage facilities, prime movers, piping and pipelines. His experience includes pipeline flow and hydraulic transient analysis, pipe stress analysis, pipeline on-bottom stability, pipeline integrity & fitness for service assessment. Throughout his years with Brown & Root (now KBR), Han-Padron Associates (now CH2M-Hill), and as an independent consultant, Mr. Gilad has been involved in the design and installation of numerous single point mooring (SPM) systems and other offshore petroleum terminals, fixed-berth and offshore cargo transfer systems, oil and gas pipelines, Pipeline End Manifolds (PLEMs), pig launching/receiving and oil storage facilities. Mr. Gilad holds a BS and MS in mechanical engineering from the Technion, Haifa and is a registered Professional Engineer in the States of TX, NY and CA. He is one of the original authors of the California State MOTEMS, and presently a member of PIANC working group, WG153, that is developing recommendations for the design of marine oil terminals.

GERARD HAGEMAN

MR. GERARD J. HAGEMAN is based in The Hague (The Netherlands), where he settled recently after 33 years in the downstream oil and gas business (including LNG). He started his career with the Gulf Oil refinery in The Netherlands as a process engineer, after which he joined Shell for 29 years. During his career Mr. Hageman has worked in numerous countries including Malaysia, Thailand, Saudi Arabia, Oman, United Arab Emirates, United Kingdom, Denmark and, of course, The Netherlands. He has been responsible for Process Engineering, Design, Operation, Start-up, Process Safety (Integrity), Interface management, Change processes, Competency assurance and Training. He holds a Masters Degree in Chemical Engineering from Twente University in The Netherlands.

DAVID HAIRSTON

MR. DAVID HAIRSTON has over 40 years of experience in project management, engineering and design, material logistics, and construction management for oil and gas facilities. Project experience includes pipeline transportation and production facilities, both onshore and offshore. Worldwide project and construction management experience at all levels includes grass-roots gathering, processing, and pipeline systems with a capital cost of over USD$ 2.5 billions. Specialized technical expertise includes river and special obstacle crossings using open-cut, bridging and directional drilling methods; offshore construction and logistics planning. Mr. Hairston has been published in ASCE Magazine, Proceedings of Marine Technology, Proceedings of several industry Pipeline Conferences, and the Oil and Gas Journal. He holds a B.S. in Aerospace Engineering from Texas A&M University and an M.S. in Civil Engineering for the University of Houston and is a Registered Professional Engineer in several U.S. states.

BOB HLOZEK

MR. BOB HLOZEK, P.E., has over 40 years of technical experience in the Oil & Gas, Refining, Petrochemicals, and Specialty Chemicals industries. Mr. Hlozek has a varied work background that includes process engineering, design and equipment sizing, research, product development, plant startups, economic evaluations, technical management, operations, sales and marketing support, and business development. He holds a Bachelor of Science in Chemical Engineering from Texas A&M and completed some graduate studies toward an MBA at the University of Delaware. Mr. Hlozek has authored 10 technical articles, is a member of AICHE, Houston Chapter AICHE, Houston GPA, Texas Professional Engineering Society, Texas A&M Clubs and has served as Chairman and Officer for several local technical and university chapters.

KEITH HODGES

MR. KEITH J. HODGES is a Learning Advisor and Instructor Development consultant. Mr. Hodges lives in Spain and is a qualified Project Manager who has managed multimillion pound building projects. In 2003 he had a paper relating to project management, published in the Public Service Review: Central Government and an article published within the Public FM in 2006. Since being associated with Campbell he has project managed protracted training programs. For a number of years he worked within National Police Training, where he designed, directed and evaluated courses at a National level, including management courses. He has been involved in Computer Supported Collaborative E-Learning since 1996 and has directed Coach/Mentor and Management courses in this medium. Mr. Hodges has a Masters Degree in Education (M.Ed.), Training and Evaluation, gained from the University of Hull in 1995, also a Post Graduate Certificate in Education from the University of the West of England in 1998.

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FRANK HOPF

MR. FRANK HOPF has 35 years of experience in engineering and management of energy transportation and distribution facilities for crude oil, refined products, petrochemicals and LNG. He also has seven years pursuing a Ph.D. in geography where he conducted research in engineering geomorphology, GIS and remote sensing, hazard analysis, and the relationship of science and public policy development. During his 31 years with Shell Oil Company and affiliated companies, he managed engineering, construction and operations for pipelines and terminals in the Gulf of Mexico, Texas, Wyoming, Montana, California, New Mexico, Mississippi, Louisiana and Washington. He also served on the board of directors of several major joint interest pipeline systems. Mr. Hopf concluded his career with Shell in the implementation of an SAP based supply chain management system for the pipeline organization. He accepted a graduate assistantship to pursue a Ph.D. in geography, completing his dissertation on the risk of levee failures in the Sacramento-San Joaquin River Delta and the impacts of the assessment of risk on public policy formation. He also studied engineering geomorphology, fluvial and coastal geomorphology, and GIS/remote sensing applications to the energy transportation and distribution industries. He has taught large courses (excess of 300 students) at Texas A&M University. Mr. Hopf was awarded his Ph.D. in December of 2011. He is a registered Civil Engineer in Texas.

ROBERT HUBBARD

MR. ROBERT A. HUBBARD is based in Norman, Oklahoma with over 40 years of experience in oil and gas facilities, worldwide. Mr. Hubbard is president of John M. Campbell & Co., a position he has held since 2010. In 2009 he retired from the University of Oklahoma where he taught courses and directed a master's program in Natural Gas Engineering and Management in the Petroleum and Geological Engineering Dept. From 1980-2002 he worked for John M. Campbell & Company where he held various management positions and provided training and consulting services to several international oil and gas companies. He also worked for Texaco from 1972-1980, where he held engineering and management positions. Mr. Hubbard is a member of SPE and GPSA, he has chaired the SPE Facility Engineering Committee and is program chair of the Oklahoma City SPE Section. He is currently a member of the SPE Project, Facilities and Construction Advisory Committee. He has published several papers in the area of gas processing and facilities design. He holds a B.S. in Chemical Engineering from Kansas State University (1971), and an MBA from Tulane University (1978).

FRANK JARRETT

MR. FRANK JARRETT has over 34 years of experience in the natural gas processing industry. His background covers design and optimization of natural gas liquids recovery, LNG processing, nitrogen rejection and recovery of helium from natural gas, acid gas removal, product distillation, dehydration, relief system design and evaluation, and plant utilities systems. He specializes in process modeling using HYSYS. He is a registered professional Engineer in the state of Colorado and has served on the Board of Directors of the Rocky Mountain Chapter of the Gas Processors Association. Mr. Jarrett received a B.S. in Chemical and Petroleum Refining Engineering from the Colorado School of Mines.

ROBIN JENTZ

MR. ROBIN JENTZ has 38 years of oil and gas processing experience. His work has included most process areas of oil and gas production, including design and testing of low dewpoint glycol dehydration units, analysis of flare and relief systems using dynamic simulation programs, retrofitting gas/liquid separators to increase capacity and eliminate entrainment, and upgrading oil dehydrators. Mr. Jentz has worked for both operating and engineering contracting companies. He is a Registered Professional Engineer in Alaska and Washington. Mr. Jentz received his B.S. in Chemical Engineering from California State University Long Beach in 1974.

JOHN KANENGIETER

MR. JOHN KANENGIETER specializes in executive coaching and working with teams in challenging work systems. His work with leaders in a consulting and executive coaching relationship is augmented by his expertise gained from 20 years in the field of experiential education and leadership development. His practice includes clients as individuals, teams, and large organizations. John is a principle trainer contracted by NASA to work with Space Shuttle Crews in the dynamics of teamwork and leadership on extended space expeditions and worked closely with the Columbia Shuttle Crew. He also works on leadership development with the U.S. Naval Academy, the Wharton School of Business and Wildland Forest Fire Crews. He holds a Masters Degree in Applied Behavioral Science with an emphasis in Executive Coaching and Consulting in Organizations from the Leadership Institute of Seattle, Bastyr University.

BILL KEETER

MR. BILL KEETER joined Allied Reliability in 2006 after serving as President of BK Reliability Engineers, Inc. where he provided training and facilitation services to help facilities improve asset performance using Weibull Analysis, Reliability Centered Maintenance, Availability Simulation, and Life-cycle Cost Analysis. Bill has over 30 years of experience in Maintenance Engineering and Management. He has successfully implemented maintenance improvement programs in a variety of manufacturing and process facilities. Bill's experience includes maintenance leadership positions in the US Military, the nuclear industry, chemicals, paper converting, and plastic film manufacturing. He has provided training and reliability consulting services to petroleum, process, mining, and defense industries in the United States, Mid-East, and Europe. Bill has developed competency maps for Reliability, Availability, and Maintainability Engineering for the Petroleum Industry's PetroSkills® program. Bill has published articles in a variety of internationally recognized maintenance publications, and has presented papers on the practical application of Weibull Analysis at several internationally attended Maintenance and Reliability Conferences. Bill is a Certified Maintenance and Reliability Professional with the Society for Maintenance and Reliability Professionals Certifying Organization. He also holds degrees in Business Administration and Electrical Engineering.

DALE KRAUS

MR. DALE KRAUS has twenty-eight years of progressive responsibility from staff to management positions within the Upstream Oil and Gas Industry. Mr. Kraus has obtained sound basis in Facility/Processing Engineering and Field Operations in Oil and Gas Production. He is also the President of D. Kraus Oil & Gas Consulting Corp. Mr. Kraus is a member of A.P.P.E.G.A and the Canadian Gas Processors Association. He holds a Bachelor's degree in Chemical Engineering from the University of Saskatchewan.

PERRY LOVELACE

MR. PERRY LOVELACE, CMRP, specializes in Maintenance and Project Management, Leadership and Competency-based Training and has over 25 years experience in industrial training and consulting. His work in competency-based workforce development is known worldwide. In addition to M&O, his participative leadership seminars have provided team-building skills to hundreds of supervisors and team leaders. He has dedicated his career to providing high quality learning experiences, keeping in tune with the changing economic and technological environment, especially as applied to long-term facilities management and organizational development. He has assisted many organizations through on-site consultation and training. Clients include industrial and utility organizations of different types and sizes in the United States, Kingdom of Saudi Arabia, United Arab Emirates, Qatar, Nigeria, Angola, Canada, New Zealand, Australia, Thailand, Malaysia, Singapore, Trinidad/Tobago, Austria, Romania, UK, Ecuador, Bolivia and Mexico. An engaging and popular speaker/facilitator, Mr. Lovelace continually receives high marks from participants. A certified Maintenance and Reliability Professional (CMRP) by the Society for Maintenance and Reliability Professionals and a member of the Society of Petroleum Engineers, Mr. Lovelace also holds a B.S. in Science Education and an M.S. in Botany from the University of Oklahoma, with pre-doctoral studies in Plant Ecology at the University of California.

KEN LUNSFORD

MR. KEN LUNSFORD has more than 34 years experience in engineering and management of oil, gas, chemicals and plastics developments. During his 32 years with ConocoPhillips he has led development teams on projects in the United States, Norway, Qatar, and United Arab Emirates. His diverse engineering and project management background includes liquefied natural gas projects, sour gas plants, oil, gas and petrochemical pipelines, engineered plastics

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processes and materials handling, batch sulphur chemical processes, and pilot plants. Additionally, he was corporate project controls manager for Phillips Petroleum with responsibility for developing business processes and training for asset development, value improving practices, project controls, contracting strategy, risk management, reviews & assists and joint venture non-operated project assurance. He received his B.S. and M.S. degrees in Mechanical Engineering from the University of Missouri-Columbia. He is a registered professional engineer in the State of Texas.

HARVEY MALINO

MR. HARVEY M. MALINO has more than 40 years of experience in the Chemical and Hydrocarbon Processing Industries. During his 28 years with Union Carbide Corporation/UOP, he held both technical and commercial positions including World Wide Sales Manager for the Gas Processing Business Group. Mr. Malino has lived and worked in New Hampshire, Maine, New York, Singapore and Chicago. He is currently based in Charleston, South Carolina where he runs his own consulting business, Exact Differentials LLC and provides technical, marketing and licensing expertise to the natural gas and oil industry. Mr. Malino is a registered Professional Engineer in the State of New Hampshire. He is a Senior Member of the Advisory Board of the Laurance Reid Gas Conditioning Conference in Norman, OK. Mr. Malino earned an M.B.A from Pace University in New York, a B.S. in Chemical Engineering from the City College of New York; and, is an alumnus of Brooklyn Technical High School.

ANDREA MANGIAVACCHI

DR. ANDREA MANGIAVACCHI is currently involved in international deep-water offshore projects on behalf of major oil and gas operators. He is also an active member of work groups involved in the development of US and international standards for offshore structures. After an early academic career with the University of Rome, Italy and with Rice University in Houston, Andrea joined Brown & Root (today KBR), where over the next 25 years he was involved in a number of major international offshore oil and gas projects (Gulf of Mexico, North Sea, South America, West Africa, Asia-Pacific). He also held a number of corporate positions in the area of deep water technology, fixed and floating offshore structures, and engineering systems. Andrea has extensive experience in conceptual field development projects, structural analysis and design, hydrodynamics, naval architecture, Computer Aided Engineering and Design. Andrea holds a M.Sc. in Nuclear Engineering and a Ph.D. in Aerospace Engineering, both from the University of Rome. He has authored or co-authored over 30 technical papers, and holds two patents.

KEVIN MCLAUGHLIN

MR. KEVIN MCLAUGHLIN is based in the UK. Mr. McLaughlin worked in the UK Chemical industry for 20 years prior to moving into the oil and gas production industry, where he has worked for 20 more years. He has specialized knowledge and experience in water treatment associated with oil and gas production systems. For more than 15 years he was manager of a group of technical specialists for a major Production Chemical Manufacturing company: with additional responsibility for product development, management and application in oil and gas production systems. He has traveled extensively to onshore and offshore locations throughout the Eastern Hemisphere solving water treatment and separation problems. Mr. McLaughlin has developed and taught courses on oilfield water treatment since 1990. He is a Member of the Royal Society of Chemistry, London, UK.

YUV MEHRA

MR. YUV MEHRA has 40 years of invaluable, hands-on practical, process engineering experience related to processing of hydrocarbons (natural gas, refining and petrochemicals) from the standpoints of major owner/operating as well as E&C companies. Mr. Mehra is an inventor (28 U.S. Patents) and a licensed professional engineer (California & Texas). He retired from Saudi Aramco in December 2011 as Gas and Light-ends Process Engineering Consultant in the Process & Control Systems Department. During 2003–04, Mr. Mehra contributed to Saudi Aramco as General Supervisor for the Upstream Process Engineering Division. He is an Alumnus of the Saudi Aramco Leadership Forum. He chaired the development of Section 14 - Refrigeration for the GPSA Engineering Data Book. Mr. Mehra holds a B.E. from IIT Roorkee and an M.S. from UCLA, both in Chemical Engineering. He focuses on identifying value-oriented opportunities, effectively communicating and following through assignments to conclusion. He has demonstrated his vast process engineering knowledge of the entire hydrocarbon value chain: oil & gas production - processing - refining - petrochemicals. His results-oriented effectiveness in process optimization, front-end engineering, project evaluations, troubleshooting, development of engineering standards, expert witnessing, assessment of intellectual property including marketability, development and offering topical courses, and integration of refining & petrochemicals is recognized industry wide.

JOHN MORGAN

MR. D. JOHN MORGAN is based in Denver, Colorado, and is Executive Vice President of John M. Campbell & Co. with over 40 years experience in the design, startup and troubleshooting of oil and gas facilities. He has published extensively on sour gas treating, sulfur recovery, CO_2 treating, materials of construction, LNG training, and cryogenic gas processing. He consults for both North American and international clients in the gas processing industry. He performs training in LNG facilities, oil and gas process facilities, and gas plants around the world. He is very active in industry activities including membership of the Editorial Review Board of the Gas Processors Supplier's Association, the Program Advisory Committee of the Laurence Reid Gas Conditioning Conference, and had served as Adjunct Professor of Petroleum Engineering at Colorado School of Mines. Mr. Morgan has many years of experience training non-native English speakers. He holds a B.Sc. (Honors) in Chemical Engineering from London University; and an M.E. in Chemical & Refinery Engineering from Colorado School of Mines, USA.

MAHMOOD MOSHFEGHIAN

DR. MAHMOOD MOSHFEGHIAN is a Senior Research Engineer and is the author of most Campbell Tips of the Month and develops technical software for JMC. He has 35 years teaching experience in universities (Oklahoma State University, University of Shiraz, University of Sydney and University of Qatar) as well as for oil and gas industries. Dr. Moshfeghian joined JMC in 1990 as a part time consultant and then as full time instructor/consultant in 2005. Previous to joining JMC, Dr. Moshfeghian was a Senior Research Scientist at Kuwait Institute for Scientific Research and Professor of Chemical Engineering at Shiraz University. Dr. Moshfeghian is a senior member of AIChE and has published more than 120 technical papers on thermodynamic properties and Process Engineering. Dr. Moshfeghian has presented invited papers in international conferences. He is a member of the Editorial Board for the International Journal of Oil, Gas, and Coal Technology. He holds a B.S. (74), an M.S. (75) and a Ph.D. (78) in Chemical Engineering, all from Oklahoma State University.

RALPH NEUMANN

MR. RALPH NEUMANN has gained experience in Oil and Gas Production, Natural Gas Processing, Specialty Fractionation, and Pipelines and Gathering Systems throughout his extensive career. Responsibilities have included the development of conceptual and detailed designs, multi-discipline project supervision, economic feasibility studies, consulting, and a variety of field services including pre-commissioning, startup, training, and trouble-shooting. He has also been responsible for project development, management of engineering (including safety and environmental), and management of field operations for a large midstream natural gas processing company. Most recently, he has been involved in the implementation of several shale gas and tight gas facility development projects. He has authored and presented technical papers to the AIChE (dynamic simulation), the Gas Processors Association (nitrogen rejection facilities, gas plant operations management, gas and NGL treating), and the Laurance Reid Gas Conditioning Conference (dehydration and amine treating). Mr. Neumann received his baccalaureate and master's degrees in Chemical Engineering from Rice University in Houston, Texas.

STEPHEN PEHNEC

MR. STEPHEN T. PEHNEC has been JMC's Manager of Operator Training since joining the company in early 1990. He is responsible for the design, development and delivery of operator training programs, worldwide. Mr. Pehnec has more than 37 years of experience in oil & gas exploration, production and processing operations, including technical, supervisory and management positions. He has delivered pre-startup training for a number of large projects, such as Qatar Petroleum's North Field Project (Um Said, 1991) and Sable Offshore

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Energy's Goldboro and Point Tupper plants (Nova Scotia, 1999). Mr. Pehnec holds a BA degree (Physics) from the California University of Pennsylvania (1971), and an MBA degree (Operations Management) from Waynesburg College (1989). He has earned instructor certificates from the Petroleum Industry Training Service (PITS, 1984) and Abacus Learning Systems (2002), and he has completed a number of JMC's engineering-level courses. Mr. Pehnec was JMC's Instructor of the Year for 2008.

PAUL PENDERGRAFT

MR. PAUL PENDERGRAFT has a Masters of Chemical Engineering degree from Oklahoma State University and worked for over 30 years with BP and its predecessor Amoco Production Company in gas processing. He worked three different times at Amoco's Tulsa Research Center, primarily in the areas of sour gas processing and sulfur recovery, and has twelve patents. He served for many years as the technical contact for the BP/Amoco Sulfur Recovery Technology. He also did research on gas separation membranes. He served in Operations, working with both sweet and sour gas plants, and in Plant Projects. He has worked in both offshore and onshore separation and processing, and served for a time as the leader of BP's Upstream Processing Network. His primary areas of expertise include project Appraise and Select stage engineering and operations troubleshooting and optimization, especially sulfur recovery units.

DENNIS PERRY

MR. DENNIS PERRY has been working in the automation, electrical and instrumentation design business for many years. His work experience includes working in the aerospace industry as an analog circuit designer, working in the electronic instrument manufacturing business as production engineering manager, and working for a major oil and gas company as a division automation supervisor and later as a staff engineer in the central, Upstream Technology group. He has also worked for an instrument manufacturer as service manager and for an engineering construction company as an instrument/electrical engineer. Mr. Perry published a paper on Multiphase measurement fall 1998 SPE, co-authored a paper for ASME/ ETCE 2000 on value of well test accuracy, presented at the Acadiana Flow measurement workshop, and co-authored a paper on heavy oil multiphase measurement with Intevep of Venezuela. Mr. Perry graduated from Louisiana Tech with a BS degree in Electrical Engineering.

JASON PINGENOT

MR. JASON PINGENOT has over 18 years of experience in planning, design, engineering, management, and commissioning for a wide range of natural gas installations; including wellhead controls, gathering systems, compressor stations, processing plants, metering facilities, and truck loading stations for projects around the globe. In the course of his career he has served the industry as a drafting instructor, engineering consultant, and led an EI&C technical team at Encana Oil & Gas (USA) to execute capital projects and develop technical and safety standards. Currently, Mr. Pingenot is the Vice President of Engineering and EI&C Manager at GWD Design & Engineering based in Denver, Colorado, with a field services office in North Dakota. Mr. Pingenot is a registered professional engineer in the state of Colorado with a bachelor's degree in Electrical Engineering from the University of Colorado.

GERARD PRENDERGAST

MR. GERARD A. PRENDERGAST, B.SC. (HONS), F.INST.L.M., DIPSYSPRAC (OPEN), is the Founder and Managing Director of Abacus Learning Systems Ltd. He is currently an Instructor Developer and Learning Advisor to John M Campbell & Company. Mr. Prendergast is a Fellow of the Institute of Leadership and Management in the UK. He concentrates on the open and flexible learning aspects of education and training, especially the delivery of training using Computer Mediated Communication - CMC - and Computer Supported Cooperative Learning – CSCL. He has trained Educators and Instructors from many Universities, and from industry and commerce worldwide in online Computer Supported Collaborative Learning Techniques. He has been visiting tutor on the 'Online Education and Training' Course run by the Institute of Education, London University, and for the British Open University's 'Teaching & Learning On-Line' course, for a number of years. In 2002, Mr. Prendergast was a contributor to an Online Trainers course run by the Northern Illinois University, USA. He has been an Advisor to The Management Institute, University of Ulster on Online Learning, and has carried out consultancy for the British Inland Revenue service in ways to deliver training by Computer Mediated Communication. He has undertaken various workshops on e-Learning throughout Germany and also at The Croatian Academic and Research Network.

JAY RAJANI

MR. JAY RAJANI worked in Amsterdam, The Hague and London for Royal Dutch Shell Group of Companies for 33 years. He started his career in the Shell Research Laboratories in Amsterdam where he was involved, in the development of refinery burners/furnaces. He later moved to Separation Technology. He worked on the development of conventional as well as membrane based gas-liquid and liquid-liquid separators. From 1987 to 2005, he worked in the Gas/Liquid Treating and Sulphur Processes department as Principal Technologist with special responsibilities as a Group Leader in the Adsorption and Catalytic Conversion Section. His last position was as a Lead Process Engineer with Qatargas 3&4 LNG Project (first with EPC contractor in Japan and then in Ras Laffan in Qatar). The last three years of the project involvement was in the construction, commissioning and start-up of the 7.8 mtpy LNG trains. Jay is now an independent consultant on Gas Technology with SBM Offshore in the Netherlands. He holds B.Sc. and Ph.D. degrees from University of London and Diploma in Management Studies from University of Coventry.

PETER RASMUSSEN

MR. PETER RASMUSSEN has over 38 years' experience in the oil and gas industry. He has broad experience and knowledge in oil and gas machinery applications and strong skills in managing and advising technology development in the oil and gas sector. Particular skills include gas turbines, high pressure centrifugal compressors and LNG refrigeration compressors. Most of his career was spent with ExxonMobil retiring as Chief Machinery Engineer (Upstream Companies). Mr. Rasmussen has coauthored papers published at LNG 15, LNG 16, Oil and Gas Journal and Texas A&M Turbomachinery Symposium. Various patents have been applied for and awarded. Mr. Rasmussen has a B.S. in Ocean Engineering from Florida Atlantic University. He is currently a Texas A&M Turbomachinery Advisory Committee Member.

JOHN RIGGS

MR. JOHN A. RIGGS is based in England where he served 30 years in the Police Service retiring in 2005 as a Chief Inspector. In the latter part of his career he became the head of training for England and Wales specialising in the training of trainers. Graduating from the University of Hull with a Masters Degree in Education (MEd -Training and Evaluation) he has a passion for the development of Trainers and Instructors. A Member of the Chartered Institute of Personnel and Development (CIPD) and a qualified coach he has recently been appointed as a 'Progression Mentor' for the Prince's Trust. He has represented the British High Commission and the British Council training trainers and Instructors in South Africa, Uganda and The Gambia. The skills he learnt during this period of his career have proved invaluable in his role as a Regional Director for 'Africa and Asia Venture' helping young adults to volunteer in schools and communities abroad. He is currently a governor at a large school in his hometown in Harrogate where he is responsible for school and community communication. During the London 2012 Olympics and Paralympics he was delighted to be part of the 'Games Maker Team' as a team leader in the Olympic Park. In March 2012 he joined the Instructor development team and is excited by his role of coaching and developing staff in their role as John M Campbell Instructors.

GEORGE RODENBUSCH

DR. GEORGE RODENBUSCH has more than 32 years of experience in the engineering and management of deepwater offshore oil and gas developments. He started his career working in R&D where he developed tools for the estimation of loads on offshore platforms induced by wind, wave and current during severe storms. He then joined a Marine Systems Engineering group, which was formed to develop concepts for the development of deepwater fields in the Gulf of Mexico. He has led the global analysis group supporting the design of the Auger Tension Leg Platform that would move the record water depth for offshore production from 410m to 870m. In addition to design activities, he spent several years working on various technical problems involving hydrodynamic and hydroelastic

Our Instructors

design of offshore platforms. He has provided development planning support to operating companies around the globe in selecting systems for the development of deepwater offshore fields. He spent several years as an Engineering Manager supervising a group responsible for the design of floating systems, risers, mooring systems and foundations for deepwater development systems worldwide. He was active in the API Offshore Structures subcommittee, which established and maintained key standards for offshore engineering, chairing that group for several years. He was appointed as a Global Technical Expert in Offshore Structure Engineering in recognition of technical expertise and global contribution and was later named the Global Discipline Head for Offshore Engineering. He holds a BS and MME in Mechanical Engineering from Rice University and a PhD in Oceanographic Engineering from Massachusetts Institute of Technology & Woods Hole Oceanographic Institution. He is a Licensed Professional Engineer in the State of Texas and is a member of ASME.

ALAN ROYER

MR. ALAN P. ROYER has more than 27 years of experience in the Oil and Gas industry working in the upstream and midstream sectors. During the past 27 years Mr. Royer has held operational, technical and managerial positions. During the first 12 years of his career he worked as an operator for Chevron Canada Resources in their gas processing facilities, and oil/gas gathering systems, located in Northern Alberta. In mid 1990 Mr. Royer left Chevron to attend the University of Alberta where he earned a B.Sc. degree in Petroleum Engineering. Later in his career, Mr. Royer spent over 12 years in the Middle East. Initially he worked in Yemen with Canadian Nexen Ltd. where he was responsible for the engineering design of various facilities, including all commissioning and start-up activities. He spent his last 8 years in the Middle East working in Qatar where he held a number of operational and engineering roles supporting the construction and start-up of the LNG Mega Trains, which have a combined production capacity of 77 million tonnes per annum. Mr. Royer is currently based in Calgary, Alberta, where he runs his own consulting business providing Facilities Engineering services to local industry. Mr. Royer is a registered Professional Engineer in the Province of Alberta, along with being an active member of Project Management Institute since 2005.

ROY SALISBURY

MR. ROY SALISBURY retired from ExxonMobil as Senior Machinery Engineer with over 35 years of rotating equipment experience in the oil and gas industry. He has advanced experience and knowledge on both capital projects and field troubleshooting. His most recent experience was on the largest LNG plant built to date, which incorporated numerous rotating equipment technology step outs. Mr. Salisbury has coauthored papers published at LNG 15, LNG 16, Turbomachinery International, Texas A&M Turbomachinery Symposium, and in *A Practical Guide to Compressor Technology* by H. Bloch. He has a B.S. in Mechanical Engineering from the University of Pittsburgh.

JOHN SHEFFIELD

MR. JOHN A. SHEFFIELD was a Senior Manager with M W Kellogg Ltd. a major UK E&C Company for more than 18 years during which time he managed the Process Engineering Department, Project Manager for development of LNG projects for export and import terminals and Commercial Vice President with responsibilities for key clients and projects. He helped develop projects for LNG facilities in the UK, China, Norway, Egypt, Germany and Australia and the development of LNG offshore technology for the Azure Project an EU funded project. With John M Campbell & Co. John is an Instructor/Consultant presenting short courses on the LNG business and technologies around the world. He also practices as a consultant, assisting companies with development of both LNG export and reception terminals and is currently active on several LNG projects in Europe and Far East Asia. Mr. Sheffield graduated from UC London with a degree in Chemical Engineering. He has served on the Management Committee of the European GPA for more than 16 years and chairs the GPA Europe LNG working party. He has presented papers at Gastech, GPA Europe and at the SMI LNG conferences dealing with LNG terminals, floating LNG developments and small scale LNG facilities.

KINDRA SNOW-MCGREGOR

MRS. KINDRA SNOW-MCGREGOR has a master's degree in Chemical Engineering and Petroleum Refining from the Colorado School of Mines, and over 15 years of experience in the Oil and Gas Industry. Particular areas of expertise include: gas treating (amine and dehydration), gas processing, LPG / condensate recovery from gas, NGL fractionation and storage, process optimization, sulfur handling, and process safety. Prior to joining John M Campbell & Company in 2008, she has served in management and lead process engineering roles in the oil and gas engineering, procurement and construction business. She has managed and served on significant projects in the industry for clients such as BP, ExxonMobil, ConocoPhillips, Occidental, QatarGas and XTO. She has been actively involved in industry groups for many years, such as the Gas Processors Association, and the Rocky Mountain Gas Processors Association (RMGPA). Currently she is on the GPA Technical Research Committee, Sub-Group 2. She has published seven technical papers at international conferences, and is a co-inventor on two technology patents in the gas processing industry.

KEN SOURISSEAU

MR. KEN SOURISSEAU has 34 years of experience with Shell. Assignments have been in front end development, process design, project engineering, operations technical support, and operations management primarily in the areas of sour gas and insitu heavy oil recovery. Mr. Sourisseau has worked throughout Alberta, in Abu Dhabi, and the Netherlands. He has authored a number of technical papers for international conferences, provided training for Shell in numerous countries, and has taught Gas Processing at the University of Calgary. He earned B.Sc. and M.Sc. degrees in Chemical Engineering from the Universities of Saskatchewan ('76) and Minnesota ('78) respectively. He is a registered professional engineer in Alberta.

WILLIAM STARKEY

MR. WILLIAM D. STARKEY has over 30 years' experience in mechanical engineering and reliability; most of it spent with ExxonMobil or Mobil Oil. He recently served as a Section Head, Machinery Section and Machinery Advisor, which is an executive level position, for ExxonMobil. He provided supervision and technical direction and support to approximately 15 machinery specialists in the Section, who form the core of machinery expertise and networking within the Downstream areas of ExxonMobil. He was responsible for providing machinery support to capital projects and technical services to ExxonMobil and affiliate locations; field support during facility turnarounds; and development of new technologies that improve/optimize machinery operability, maintainability and reliability. Activities also included close alliances and best practice sharing with global Downstream field locations and the parallel machinery groups in the Upstream organization. He also coordinated with Upstream for the preparation, development and maintenance of ExxonMobil Engineering Practices and research and development programs for machinery, including equipment health monitoring. Mr. Starkey is a past participating member of the American Petroleum Institute Sub-Committee on Mechanical Equipment. He holds a B.S. in Mechanical Engineering from the University of Kentucky (1968).

GORDON STERLING

MR. GORDON STERLING is based in The Woodlands, Texas. He serves on the Board of Directors of John M Campbell Holdings. In a 35-year career with Shell E & P, USA, he was involved in many record setting Gulf of Mexico deepwater developments. He was the Manager of Major Projects for Shell's Deepwater Division in New Orleans during the mid and late 1990's when the Mars, Ram Powell and Ursa TLP's were designed, built and installed, (Ursa in 3950 feet of water) and when the Mensa subsea development in 5400 feet of water was designed, built and brought on production. From 1991 through 1999 he was on the Board of Directors of the Offshore Technology Conference (OTC), the largest technical conference related to offshore oil and gas in the world, annually host to 70,000 or so visitors in Houston Texas. He was Chairman of the conference in 1998 and 1999. In 2008 he was chosen for the prestigious Heritage Award by the OTC. With this background he brings a broad knowledge of the early development planning steps, and a detailed knowledge of the development and production system options. In association with two colleagues he has written a book titled "Deepwater-Petroleum Exploration and Production-A non-technical guide", of which a second edition was published in 2011. He holds a B.A.Sc. (Honors) in Civil Engineering from the University of Waterloo, Canada, and an M.S.C.E. (Structures) from Lehigh University, Bethlehem, Pennsylvania.

Our Instructors

DAVID TENHOOR

MR. DAVID A. TENHOOR, CPIM has been consulting and teaching APICS (The Association for Operations Management) CPIM certification courses since 2005. He has taught in many different industries from chemical processing to discrete manufacturing. Companies include BASF, National Oilwell Varco, Halliburton, ExxonMobil Chemical and Cameron. David brings a well-rounded package of industry experience to PetroSkills/JMC. He has held positions in Inventory Control, Manufacturing Management, Strategic Sourcing and Transportation/Distribution Management. He also has experience in Finance and Product Development. David received his undergraduate degree in Geology from Hope College in Holland, Michigan and an MBA in Supply Chain Management from Michigan State University. He is a member of the Houston Chapter of APICS and served two terms on the Board of Directors as Treasurer.

BUCK TITSWORTH

MR. BUCK TITSWORTH's experience includes over 40 years with major international operating and service companies in worldwide oil and gas production/process engineering, project execution, and business planning. Specific experience includes: upstream projects (Middle East - Saudi Arabia, Egypt, Kuwait); oil & gas pipeline and production facilities projects (South America, the Far East, FSU, Austral-Asia); FPSO/mobile system development projects (Canada, Asia-Pacific, West Africa); refining projects (USA and eastern Europe); and global business/strategic planning for the engineering and construction industry. Assignments have included establishing joint ventures and/or new offices in Vietnam, Pakistan, Nigeria, Australia, Canada, and Holland. Mr. Titsworth has a BS in Chemical Engineering from the University of Houston, and is a registered professional engineer in four states.

PAUL VERRILL

MR. PAUL VERRILL has over 25 years' experience working in the chemicals, petrochemicals, hydrocarbon processing and power sectors with the last 15 years predominantly in gas processing and gas and liquid pipelines. He has held a number of technical and senior management positions including Mechanical and Piping Designer, Machinery Engineer, Project Manager, Engineering and Maintenance Manager and other Senior Plant and Business Management roles. He has worked for a number of international operating and engineering companies including ICI, Rolls Royce and Enron Engineering & Construction, working on projects around the world. His experience includes piping and mechanical equipment design, rotating equipment engineering, project management, gas processing project development including FEED study management and operations and turnaround management. For the previous 3 years Mr. Verrill has been working in the senior management team of an 800mmscfd gas processing facility which has been developing the onshore assets for a new UK gas field. In 2011 Mr. Verrill started working with JM Campbell as an Instructor in addition to providing project development and asset management services through his own consultancy company. Mr. Verrill is based in Yorkshire, England and graduated with a B.Eng degree in Mechanical Engineering from Newcastle University in the UK and he is a Chartered Member of the Institute of Mechanical Engineers.

STUART WATSON

MR. STUART WATSON has over 15 years of experience in oil and gas processing. His experience has taken him to facilities around the world in regions including Australia, Africa, the Middle East and the US. Mr. Watson graduated with honors in 1996 from Curtin University, Perth, Australia with a bachelor's degree in Mechanical Engineering. After graduating he worked in Perth, Australia supporting Woodside's offshore facilities. In January 2000, Stuart accepted a position with Pearl Development Company of Colorado where he worked over the next eight years at many of the Gas production and processing facilities in the western US. His work included Expansions for Unocal Alaska, Facilities engineering at the El Paso Field Service's 650MMscfd "Chaco Plant" and various other projects in Colorado and Wyoming. In 2008, he oversaw and commissioned a 92MMscfd amine sweetening and cryogenic NGL train for the Government of Ras Al Khaimah (U.A.E.). Thereafter, he started his own engineering consultancy supporting both mechanical and process disciplines. Stuart began instructing for John M. Campbell in January 2009 with piping and rotating equipment disciplines and supports JMC Consulting services in an array of process startup and engineering design roles.

PETER WILLIAMS

MR. PETER WILLIAMS has over 35 years of industrial experience, most of which were in oil and gas processing. His experience includes plant process engineering, operations supervision, project development and business case definition, project technical support, plant engineering management, and internal consulting, primarily with Saudi Aramco. Canadian experience includes plant engineering in phosphorus production, heavy water, and bitumen upgrading, and project engineering. He also has experience with benchmarking, implementation of a safety management system, and the application of lean Six Sigma methods to engineering management. He has Masters' degrees in Chemical Engineering and in Economics, is a Professional Engineer in Alberta and is a certified Six Sigma Black Belt.

RONN WILLIAMSON

MR. RONN E. WILLIAMSON, C.P.M., CFPIM is Technical Training Director of John M. Campbell & Co. He has been consulting and instructing in the field of supply chain management for more than fifteen years. During this time, he has delivered significant value to more than fifty, cross-industry organizations around the world. He has provided education programs internationally to hundreds of people in procurement, logistics and materials management. In 2005, he joined the PetroSkills/John M. Campbell team to develop a competency-based training tool with linked industry course offerings for Procurement/Supply Chain Management (PSCM) professionals in the oil and gas industry. Mr. Williamson gained his supply management expertise during twenty-three years of operational and management roles for a major equipment OEM company. For five years, he had executive responsibility for purchasing and transportation at Thermo King Corporation, a subsidiary of Westinghouse Electric and a billion-dollar global business. He received an undergraduate degree (BME) in engineering and a master of business administration degree (MBA) from the University of Minnesota. Mr. Williamson has been a member and past chapter president, of the American Production and Inventory Control Society (APICS), is a member of and frequent presenter for the Institute for Supply Management (ISM), and is a member of the International Association for Commercial Contract Management (IACCM). He is also certified at the Fellow Level by APICS and has a lifetime certification from ISM.

WES WRIGHT

MR. WES WRIGHT has 25 years experience in oil and gas producing facilities. Mr. Wright began teaching with John M Campbell in 2004 where he has been delivering courses in CO2 Surface Facilities, Oil and Gas Processing and Operator Training world-wide. Prior to joining John M Campbell, Mr. Wright was the lead on-site engineer at the Weyburn CO2 Miscible flood where he was closely involved in the development, design, construction, start-up and operations. Through the 1980's, Mr. Wright performed contract research at the University of Calgary in Enhanced Oil Recovery and was a consultant on a wide range of sweet and sour oil and gas projects throughout Western Canada. Mr. Wright graduated in 1983 with a BSc in Engineering from the University of Calgary. He is a Professional Engineer in Saskatchewan and Alberta, Canada and is a member of the SPE. He has been published in the ASME-OMAE, the CSCE and the IAHR.

CLYDE YOUNG

MR. CLYDE YOUNG has over thirty years of diverse experience in operations and maintenance of production and processing facilities. This includes significant experience in operations and development of management systems for gas processing and water/wastewater treatment facilities. This includes operating procedure development, training program development, compliance auditing, vulnerability assessment, emergency planning and mechanical integrity program development. Mr. Young provides many of our clients with PHA services, compliance audits and Hazards Reviews. Mr. Young has presented at the Mary K. O'Connor Process Safety Symposium and written several papers that have been published in various industry publications. Mr. Young holds a B.S. in Social Sciences from the University of Wyoming- Laramie Wyoming.

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CERTIFICATES, PROFESSIONAL DEVELOPMENT HOURS (PDHs) AND CONTINUING EDUCATION UNITS (CEUs)

A Certificate of Completion is awarded to each participant who satisfactorily completes the course and will be awarded by the instructor(s) on the final day.

John M. Campbell course hours can be used to satisfy PDHs for licensed engineers in most states. In many instances Campbell course hours can be used for international CEU credit also. At every Campbell course a form is available that can be used to submit your course hours to your licensing board or accrediting body for approval.

REGISTRATION AND PAYMENT

In a worldwide teaching operation, sufficient lead time is needed for course logistics. For this reason, PetroSkills/John M. Campbell & Co. would appreciate receiving registrations at least one month before the course. However, we accept paid registrations for a viable session through the day before the course begins. Registrations can be made online at www.petroskills.com or www.jmcampbell.com or by contacting customerservice@petroskills.com or registrar@jmcampbell.com for a Registration Form.

Registrations are confirmed upon receipt of payment. In the meantime, an Acknowledgment of Reservations will be issued via email. Once payment is received, an email will be issued confirming the registrant's seat in the course. Please note we do not arrange hotel accommodations for participants. When possible, we reserve a block of rooms at the suggested hotel(s). Participants should contact the suggested hotel directly for room rates and availability at least three weeks before the course begins. Remember to mention that you are attending a PetroSkills or John M. Campbell & Co. course to receive a discounted rate, if applicable. Please note if a course venue changes for whatever reason, the participant or their representative will be contacted via email.

John M. Campbell & Co. reserves the right without payment of consideration to videotape, film, photograph and/or record course sessions and course participants in any media type and to alter or edit these images for use in its publications, including website entries.

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Tuition fees are due and payable in US dollars upon receiving the corresponding invoice. Again, a registration will not be confirmed until payment has been received.

Tuition fees do not include living costs, but do include tuition, purchase price of course materials, daily refreshments, and a $100.00(USD) non-refundable registration fee, per five days of training or less. Tuition must be paid prior to the first day of the course. If payment has not been made prior to the course start date, the registrant or their representative should contact the appropriate Customer Service Department to make payment arrangements.

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Substitutions may be made at any time without penalty.

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Transfers and cancellations will not be honored and tuition is forfeited and non-transferable for courses that have reached maximum participation regardless of the amount of notice given.

We reserve the right to cancel any course session at any time. This decision is usually made approximately two weeks before the course begins. If we cancel a course, enrollees will be given the opportunity to transfer to another course or receive a full refund, provided the enrollment was not transferred into the cancelled course late. Keep our cancellation policy in mind when making travel arrangements (airline tickets, hotel reservations, etc.), as we cannot be responsible for any fees charged for canceling or changing your travel arrangements. We reserve the right to substitute course instructors as necessary.

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