

A LDI Training Course

HAZARD AWARENESS AND SAFETY IN DESIGN

Recognizing and Mitigating Human Errors in Oil and Gas
Surface Production Facilities

Dr. Maurice Stewart, PE, CSP

OVERVIEW

This intense, comprehensive and practical 3-Day workshop is integrated and highly interactive. It studies all aspects of Hazards Awareness and Safety in Design with particular focus on the practical aspects of recognizing and mitigating human errors in oil and gas facilities. A proper understanding of the subject matter is essential if one is to minimize incidents, prevent injury to personnel, pollution and loss of company assets.

Dr. Maurice Stewart has a storehouse of knowledge and experience that he passes along to help workshop participants get a unique approach in recognizing, preventing and mitigating potential human error's in oil and gas facilities and insuring the safety in design. Dr. Stewart illustrates the concepts discussed through the use of 35 mm slides and DVDs. The workshop reviews hundreds of actual common hazards found on nearly every oil and gas facility worldwide

WHAT YOU WILL LEARN

- Learn the latest developments in Human Factors Engineering
- Learn the Obstacles to Continuous Safety Improvement and proven procedures to overcome them
- Learn a systematic Behavior-Based Safety Process to eliminate hazards and injuries from the workplace
- How to evaluate your workplace and operating/maintenance procedures for "hidden" hazards
- How to use a set of Objective Criteria to assess existing operations and to guide in new designs
- How to effectively design facilities and work areas to reduce human errors and improve performance
- Explore proven and recommended procedures to identify, analyze and correct potential hazardous conditions thus reducing overall facility risk
- Understand the principles of safe facility design and operation
- Learn the types of human error and how to avoid them
- Learn to identify the hidden pitfalls in design and operation
- Learn the principles in safety in design
- Understand the strategies to prevent fires and explosions
- Learn inherent safer design principles

COURSE CONTENT

Safety Behavior Overview

- Continuous safety improvement
- Lessons learned
- Basic steps to improve operator safety
- Obstacles to continuous safety improvement

Behavior-Based Safety Process

- What is behavior observation?
- Basic concepts of behavior observation
- What controls behavior?
- Critical behaviors
- Characteristics of a good behavior observer
- Key points of behavior observation
- Observation categories
- Behavior-Based*** safety process

Principles for Safe Facilities Design and Operation

- Contain Hydrocarbons
- Minimize Chances of Hydrocarbon Ignition
- Prevent Fire Escalation
- Provide Personnel Protection and Escape

Types of Human Error

- Errors due to a moments forgetfulness
- Errors that could be prevented by better training or instruction
- Errors due to lack of physical or mental ability
- Errors due to lack of motivation-errors preventable by better supervision
- Review appropriate case studies

Incidents Due to Human Falling

- Incidents that could be prevented by better design
- Incidents that could be prevented by better construction
- Incidents that could be prevented by better maintenance
- Incidents that could be prevented by better method of operation
- Review appropriate case studies

Human Factors Engineering

- "Human Factors Engineering"*** considerations
- When to consider human factors
- Human's strengths and weaknesses
- Considerations related to efficiency and safety
- Questions that should be addressed in design and operation
- Common Pitfalls in design and operation
- Review of ASTM F1166

Safety In Design

- Inherent Safer Design Principles
 - Elimination of Hazards Through Process Design
 - Inherently Safe/Safer Concepts
- Materials of Construction
 - Metal Structure and Properties
 - Failure and Failure Mechanics
- Corrosion Considerations
 - Theory of Corrosion
 - Types of Corrosion
 - Corrosion Prevention Techniques
- Equipment Design and Operation Considerations

- General Hazards
- Loss of Containment
- Gas/Liquid Separators
- Heat Exchangers
- Pumps and Compressors
- Oil Treating Equipment
- Adsorption and Absorption Equipment
- Gas Dehydration Equipment
- Gas Sweetening Equipment
- Water Treating Equipment
- Piping and Pipeline Systems
 - Piping Integrity
 - Potential Weak Points
 - Thermal Displacement
 - Two-Phase Flow
 - Velocity Criteria
 - Flanges and Gaskets
- Relief and Flare Systems
 - Relief Scenarios
 - Flare Sizing
 - Two-Phase Systems
 - Temperature Activated Relief Valves
- Strategies to Prevent Fires and Explosions
 - Inerting
 - Purging
 - Static Electricity
 - Area Classification
 - Fire and Explosion
 - Flammability Ranges
 - Sources of Ignition
 - Ventilation
 - Adequate
 - Inadequate
 - Isolation Systems
- Modifications
 - Hardware Modifications
 - Management of Change
 - Maintenance Issues
 - Temporary Modifications
 - Scale-Up
 - Change of Duty (Back-to-Back)
- Work Space, Access to Equipment and use of Combustible Materials
- Railings
- Stairways, Ramps, Stiles, Walkways and Platforms
- Guards: Mechanical, Hot Surface and Chemical Spray
- Electrical Equipment
- Instrumentation
- Rigging Practices
- Scaffolds
- Access for Physically Disabled Employees
- Safety Shower/Eye-Wash Units and Chemical Hazards
- Ventilation
- Miscellaneous**

WHO SHOULD ATTEND

- Personnel who are engaged in managing, evaluating, designing, selecting, specifying, operating and trouble-shooting oil and gas surface production facilities and want a better understanding of the hazards associated with these facilities
- Managers and specialists who are responsible for managing, operating, designing, selecting, specifying, and trouble-shooting oil and gas surface production facilities

- Company personnel responsible for organizing, leading and managing oil and gas surface production facilities
- Personnel whose job responsibilities include
 - Supervising or Advising,
 - Monitoring and Auditing,
 - Evaluating,
 - Implementing,
 - Designing, or
 - Operating
 Company drilling and surface production facilities in the office or in the field.
- Those personnel include
 - Site managers and Production Superintendents;
 - SE Superintendents; Maintenance Superintendents;
 - Project Managers and Engineers;
 - Foremen, Superintendents, or Supervisors;
 - Operations Managers and Supervisors;
 - Other Operations Personnel;
 - HS&E Professionals;
 - Other professionals with little to moderate background in hazards awareness, or who want a better understanding of the subject matter.

YOUR COURSE INSTRUCTOR

Dr. Maurice Stewart, PE, CSP, a Registered Professional Engineer with over 40 years international consulting experience in project management; designing, selecting, specifying, installing, operating, plant optimizing, retrofitting and trouble-shooting oil, water and gas handling, conditioning and processing facilities; leading hazards analysis reviews and risk assessments.

He is **internationally respected for his teaching excellence and series of widely acclaimed textbooks** in the areas of designing, selecting, specifying, installing, operating and trouble-shooting: 1) oil and water handling facilities, 2) gas handling, conditioning and processing facilities, 3) facility piping and pipeline systems, 4) gas sweetening, 5) gas dehydration, 6) pumps, compressors and drivers, 7) instrumentation, process control and safety systems, 8) oil and gas measurement and metering systems and 9) conducting safety audits, hazards reviews and risk assessments. Dr. Stewart is one of the co-authors of the ***SPE Petroleum Engineering Handbook***. He has authored and co-authored over 90 technical papers and has contributed to numerous conferences as a keynote speaker. To date, Dr. Stewart has taught over **60,000 professionals in 90 countries**. He has provided consultation and/or instruction in virtually every oil and gas production sector in the world, including the Middle East, UAE, Northern and Western Africa, Angola, Nigeria, North Sea, Western and Southern Europe, China, Central Asia, Democratic Republic of Congo, Indonesia, Malaysia, Myanmar, Thailand, Brunei, India, Kazakhstan, Central and South America, Australia, Canada and throughout the United States.

He has provided **consultation and/or instruction** to well over **100 oil and gas related companies worldwide** and is currently held on retainer by a number of companies where he regularly provides consultation regarding complex oil and gas issues related to surface production facilities. A partial list of his clients include: Abu Dhabi Oil Company, Exxon USA, Esso Producing Malaysia Inc, Petronas, Petronas Carigali, Petronas Gas, Sarawak Shell, Gas Malaysia, BP, DeltaAfrik, Occidental Petroleum, Kuwait Oil Company, Saudia ARAMCO, AMOCO, ADNOC, Qatar Oil Company, Nipon Oil Company, Shell USA, Conoco Inc., Brunei Shell, DeltaAfrik, Oryx Ecuador Energy Company, Petro-Amazonas, Petro-Ecuador, British Gas, Texaco, Petro China, Petro Viet Nam, Maxus Indonesia, Maxus Ecuador Inc., CNOOC, Cabinda Gulf Oil Company Ltd., Caltex Pacific Indonesia, Vico Indonesia, Mobil Producing Nigeria Unlimited, PTTEP, Chevron Nigeria Ltd., Chevron Overseas Producing Inc., Chevron USA, Chevron Thailand, Pertamina, UNOCAL Indonesia, UNOCAL USA, Unocal Thailand, Spirit Energy 76 ,ChevronTexaco, Medco, Migas, Total Indonesie, TotalFinaElf Myanmar, Total Fina

Elf, Total E&P, Sonangol P&P, Exspan, Tengizchevoil, Exxon Mobil, Mobil USA and Royal Dutch Shell.

He also serves on numerous international committees responsible for developing or revising industry Codes, Standards and Recommended Practices for such organizations as ANSI, API, ASME, ISA, NACE and SPE. Dr. Stewart is currently serving on the following American Petroleum Institute (API) committees: *API RP 14C, RP 14E, RP 14F, RP 14G, RP 14J, RP 500 and RP 75*. Dr. Stewart has developed and taught worldwide short courses for API related to Surface Production Operations. In 1985, Dr. Stewart received the National Society of Professional Engineers "**Engineer-of-the-year**" award.

He is very active in the Society of Petroleum Engineers (SPE). He served on the board of directors for the Delta Section for over 10 years, chairman and committee member of the professional engineering registration committee for five years and chairman of the continuing education committee for eight years. For twelve years he conducted a review course that prepared petroleum engineers for the "Principles and Practice" examination in Petroleum Engineering. He developed and has taught worldwide short courses for SPE related to Surface Production Operations. For his continuous effort in the advancement of Petroleum Engineering he was awarded the SPE Regional Service Award.

Dr. Stewart holds a BS in Mechanical Engineering from Louisiana State University and MS degrees in Mechanical, Civil (Structural Option) and Petroleum Engineering from Tulane University and a Ph.D in Petroleum Engineering from Tulane University. Dr. Stewart served as a Professor of Petroleum Engineering at Tulane University and Louisiana State University.

Enrollment Information

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