



The Second Texas A&M at Qatar Safety Symposium



"Process and personal safety are not achieved by accident"

15-16 March 2011

Under the presence and sponsorship of
H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani
Minister of State for Internal Affairs

Texas A&M University at Qatar, Engineering Building, Room 238



TEXAS A&M
UNIVERSITY *at* QATAR





TEXAS A&M
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Howdy and welcome to Texas A&M University at Qatar and its second annual safety symposium.

This event is an important forum for discussion of a topic that, quite literally, affects all our lives. Safety not only is a discipline for academic study and research — it is the cornerstone of the industrial processes upon which Qatar’s economy is based and its energy sector thrives. I applaud the speakers and participants at today’s symposium for their commitment to safety and to advancing its practice.



It is important to recognize H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani, Minister of State for Internal Affairs, and the Ministry of the Interior for underwriting this symposium. Their generous support further underscores the importance that the State of Qatar places on safety and today’s symposium would not be possible without it.

Texas A&M at Qatar is proud to be a resource for outstanding engineering education and research for Qatar and the region. We strive to provide knowledge and inspire innovation that build Qatar’s capacity for growth and success, and safety is an essential element in every phase of that development. Thank you for promoting safety and for helping to explore ways to make it more effective.

Once again, welcome to Texas A&M at Qatar, and best wishes for an outstanding symposium today.

Sincerely,

Mark H. Weichold, PhD
Dean and CEO



Hazard Identification Risk Assessment Regulations



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Process Safety Management
Emergency Planning
Societal risk

Program

Tuesday, 15 March 2011

08.00 – 08.45 Registration, refreshments

08.45 – 08.50 Introduction, **Dr Luc Véchet**, Texas A&M University at Qatar

08.50 – 09.00 Welcome and opening of the symposium,
Dr Mark Weichold, Dean & CEO, Texas A&M University at Qatar

09.00 – 09.30 Plenary Keynote Lecture
Importance of effective management systems in addressing process safety
Roland Moreau, ExxonMobil, USA

09.30– 10.00 The Directorate HSE Regulations & Enforcement's current approach
to HSE Risk Regulating in the Energy Industry
Timothy Harding, HSE Directorate of Regulations & Enforcement, Qatar

10.00 – 10.30 Societal risk representation for effective risk communication
Dr Mike Wardman, Health And Safety Laboratory, UK

10.30 – 11.00 Coffee Break

11.00 – 11.30 Dynamic Risk Assessment: A Tool for Process Safety Assessment and
Management
Dr Faisal Khan, Memorial University of Newfoundland, St John's,
Canada

11.30– 12.00 NFPA 1600 Standard on Disaster/Emergency and Business Continuity
Programs 2010 Edition: An integrated approach to resiliency
Dr Dean Larson, Captain USN (Ret), Larson Performance Consulting,
LLC, USA

12.00 – 12.30 Emergency Planning – The Industrial Perspective
Christopher Dolan, Qatar Petroleum

12.30 – 13.30 Lunch and networking

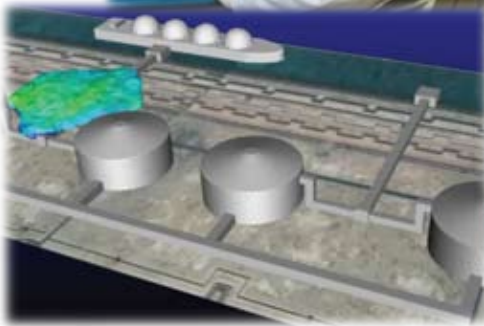
13.30 – 14.00 Towards a new alarm system design philosophy
Dr Salim Ahmed, Qatar University

14.00 – 14.30 Safety considerations of carbon capture and sequestration
Dr Laurence Cusco, Health And Safety Laboratory, UK

14.30 – 15.00 The Institution of Occupational Safety and Health – an overview
Christopher Dolan, Qatar Petroleum



**Research
Experimentation
Education**



**Modeling
Training
Incident Investigation**



Program

Wednesday, 16 March 2011

08.00 – 08.30 Registration, refreshments

08.30 – 09.00 Are we serious about learning lessons from incidents?
Dr Simon Waldram, Retired, Previously at Texas A&M at Qatar, UK

09.00 – 09.30 Continuous Safety Improvement (CSI) within a risk based process safety management program
Mike Snakard, AcuTech Consulting Group, USA

09.30 – 10.00 Controlling Ignition Sources Including Diesel Engines
Jogen Bhalla, AMOT, USA

10.00 – 10.30 Safety requirement and fire protection for buildings in Qatar,
Lieutenant Ahmad Khalid AL-Ghanim, Fire Prevention Department, General Administration of Civil Defence, Qatar

10.30 – 11.00 Coffee Break

11.00 – 11.30 The importance of fire systems and the efficiency of the fire equipments quality on buildings,
Lieutenant Ghanim Salem Al-Naimi, Fire Prevention Department, General Administration of Civil Defence, Qatar

11.30 – 12.00 Challenges in Consequence Analysis
Dr Doug Hissong, ExxonMobil, US

12.00 – 12.30 Ras Laffan Emergency and Safety College - The facility of the future
Jon Swain, Ras Laffan Emergency & Safety College, Qatar

12.30 – 13.30 Lunch and networking

13.30 – 14.00 Process safety research activities at Texas A&M University at Qatar
Dr Luc Véhot, Texas A&M University at Qatar

14.00 – 14.30 The flat-fan water curtain and fences as an LNG vapor mitigation measure – the experiments, analyses and CFD simulations
Dr Tomasz Olewski, Texas A&M University at Qatar

14.30 – 15.00 Discussion

The Second Texas A&M Safety Symposium is held under the presence and sponsorship of

H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani
The Minister of State For Internal Affairs



H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani

H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani holds a Bachelors Degree in Police Science from Durham Military College in Briton in 1984 and a Bachelors Degree of Legislation from Beirut Arab University in 1995.

Positions held:

- Patrols officer at Rescue Police Section (1985).
- Security officer for stadiums at Capital Security Section (1989).
- Assistant Commander for Support Brigade at Emergency Police Section.
- Commander for Special Operations Brigade at Special Security Force Department.
- Commander for Special Unit at Special Security Force Department.
- Assistant Director for Special Security Force Department for operations affairs (28/12/2001).
- Assistant Director for Special Security Force Department (11/7/2001).
- Director for Special Security Force Department (7/1/2002)
- Commander for Internal Security Force (Lakhwiya, 6/9/2004).

On 15/2/2005, H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani was appointed as **Minister of State for Internal Affairs and member of ministers' council of the State of Qatar.** H.E. Sheikh Abdulla Bin Nasser Bin Khalifa Al-Thani has completed more than 23 qualifying and specialization training courses from Qatar and abroad as well in the field of Special Security Force.

Missions and Participations:

- Head of National Anti- Terrorism Committee.
- Represented the country in various conferences, seminars and meetings.
- Took part in preparing security agreement project on countering terrorism in the GCC member states.
- Participated in the special international conference on public security and terrorism held in New York.
- Attended the conference on “Preventive Security and Protection Program” held in New York.
- Participated in the coordination meeting of institutions of Islamic conference on countering international terrorism.
- He was a member in the team of specialists from the Interior Ministry to study the international treaty related to terrorism.
- Attended many conferences and meetings accompanying the minister of interior and undersecretary of interior ministry.
- Headed the Qatar’s delegation to the International Conference on Countering Terrorism which held at Riyadh of Saudi Arabia.
- Attended several conferences, meetings and seminars in the field of security.

Source: http://www.moi.gov.qa/site/english/aboutmoi/State_Minister.html



Ministry of Interior of the State of Qatar

The rulers of the State of Qatar gave high priority for the mission of achieving public security and peace since the modern State of Qatar was established. The formation of police agency guaranteed maintenance of discipline and security, protection of lives and prestige of people and public and private properties as well.

The first police agency formed in the State of Qatar was "Discipline Police" in 10/9/1949. This agency began its duties in 1949 at " Doha Police Section" which was located in the centre of "Souq Waqif ". The functions of this section comprised of providing security and protection for citizens, maintaining discipline by moving patrols, carrying out the mission of permanent guards at vital areas in the capital and organizing traffic movement. It also carried out all other police related duties like follow up of criminals, conducting investigations on criminal and traffic cases and referring the accused to the courts in addition to deporting the suspects if they deserve it.

The Ministry of Interior was formed in 1970 according to the decree No. (5) for the year 1970 stipulating the functions of the ministries and other government organizations in the country.

Ministry of Interior continued since that time its functions and missions providing peace and security and organizing police forces guaranteeing the protection of national security and maintaining safety and security of nationals and expatriates as well along with taking all necessary measures to prevent the happenings of crimes and disclosing the secrets of committed crimes in addition to taking care of nationality related affairs, issuing travel documents, organizing expatriates entry to the country and their residence and organizing the prison.

The Ministry of Interior since that time has been investing fateful and continuous efforts through which it could to create a capable and advanced security agency that proved its ability in bearing the fidelity, achieving desired security and protection of the society.

Convoing with the developments witnessed by the State of Qatar under the auspicious leadership of H.E. Sheikh Hamad Bin Khalifa Al Thani, The redeemed Emir of Qatar and Heir Apparent H.E. Sheikh Tamim Bin Hamad Al Thani, The role of Ministry of Interior and its departments is getting bigger in the field of maintaining security and stability to meet with the requirements of comprehensive renaissance and development in the country.

Within a short span of time, The Ministry of Interior has accomplished many achievements and victories as a result of its development and modernization planning that depend on providing technical and human resources needs through proper supply of devices and equipments and widening the scope of rendered services for the public according to the creative security strategic plans that comprise of requirements of the present and the future, working with the spirit of cooperation and initiatives and activating community partnership between police agencies and community members either it is represented by individual or organizations or establishments in order to realize the concept of joint responsibility in providing more security, safety and stability for the society.

Source: <http://www.moi.gov.qa/site/english/index.html>

The Second Texas A&M at Qatar Safety Symposium
15-16 March 2011
Doha, Qatar

Speakers

Dr Salim Ahmed

ASSISTANT PROFESSOR, DEPARTMENT OF CHEMICAL ENGINEERING, QATAR UNIVERSITY, QATAR



Dr. Ahmed received his Bachelor and Master Degrees in Chemical Engineering from Bangladesh University of Engineering & Technology, and Ph.D. in Process Control from University of Alberta, Canada. Currently he is serving as an Assistant Professor in the Department of Chemical Engineering at Qatar University, Qatar. Prior to joining Qatar University he worked as a Postdoctoral Fellow at University of Alberta. Dr. Ahmed's research is focused on developing simple methods to solve complex industrial problems. He is a leading expert of transient process model development; his work is widely cited in academia and used in industry. Many of his peer reviewed papers are among the most read articles. He is currently working on system identification, alarm design, risk assessment and oscillation analysis.

Title: Towards a new alarm system design philosophy

Abstract: A major industrial accident may cost tens of billions of dollars. Nevertheless accidents are repeating, e.g. petrochemical sector alone witnesses a major accident every three years. Also minor incidents take place on a regular basis. Accidents not only result in monetary loss, they cost human lives and cause environmental disasters. Alarms are at the forefront of the safety system in a plant to prevent accidents. The purpose of an alarm is to warn a possible critical condition and thus to prevent, control and mitigate the effects of an abnormal situation. However, on many occasions, alarms have been reported as a contributor to abnormal events. One reason for alarms becoming the cause of an undesired event is the appearance of too many alarms when the process approaches an abnormal situation. This means that the alarm system is least effective when it is needed most. We believe that it is necessary to develop a new philosophy for alarm system design. We propose a new methodology where alarms are related to the risk associated with sets of variables. This is a shift in alarm design paradigm from the idea of assigning alarms to individual variables to the concept of relating alarms to the risk associated with sets of variables. The challenges of risk based alarm design, risk characterization and risk evaluation will be identified and addressed.

Lieutenant Ahmad Khalid Al-Ghanim

SENIOR FIRE SAFETY ENGINEER, IN THE FIRE PREVENTION DEPARTMENT AT GENERAL ADMINISTRATION OF CIVIL DEFENCE - QATAR



Lieutenant Ahmad Khalid AL-Ghanim currently holds the position of Senior Fire Safety Engineer, in the Fire Prevention Department at General Administration of Civil Defence of the State of Qatar.

Lieutenant Ahmad Khalid AL-Ghanim studied Fire Engineering in USA. He obtained his bachelor degree in Fire Safety Engineering from the Eastern Kentucky University (EKU) in the USA in 2007.

Lieutenant Ahmad Khalid AL-Ghanim attended a number of OSHA courses in EKU in 2007. Before that, he had a long experience in Architecture design by taking courses. Lieutenant Ahmad Khalid AL-Ghanim joined the General Administration of Civil Defence in 2009. He worked in the Planning Section of the Fire Prevention before taking the Fire Safety Specialist course in Singapore on 2011.

Title: Safety requirements and fire protection for buildings in Qatar.

The Fire Prevention Department is one of Qatar Civil Defence departments. It has many sections which provide safety in buildings.

The planning section is one of those sections which provides safety requirements and proving of buildings plan with specific safety codes. So, we will clarify the procedure of proving the plans and how the codes affect the safety in the buildings.

Lieutenant Ghanim Salem Al-Naimi

MECHANICAL ENGINEER IN THE FIRE PREVENTION DEPARTMENT
AT GENERAL ADMINISTRATION OF CIVIL DEFENCE – QATAR.

Born in Doha, Qatar on October 1st 1986, Lieutenant Ghanim Al-Naimi trained as a mechanical engineer in both the USA and UK. He obtained his BSc. degree as a Mechanical Engineer from Teesside University, UK, on July 2010 before completing his Fire Safety Specialist course in Singapore.

Lieutenant Ghanim Al-Naimi started his career as a mechanical technician in the maintenance department from 2003 to 2004 at Qatar Petroleum. He graduated from Industrial of Technology School and he was specialist in manufacturing the mechanical equipments.

Lieutenant Ghanim Al-Naimi currently holds the position of Mechanical Engineer in the Fire Prevention Department at General Administration of Civil Defence of the State of Qatar.



Title: The importance of fire systems and the efficiency of the fire equipments quality on buildings.

The fire system has become necessary and very important to ensure the safety of buildings. It has many advantages and disadvantages that we would like to discuss, and how it can help the fire fighters during the fire.

The fire equipments which are used in the buildings are proved by the Fire Prevention Department before installation in buildings to check the quality of the fire products and how they can affect the building safety.

Jogen Bhalla

VICE PRESIDENT AT AMOT, USA

Jogen Bhalla is a Vice President at AMOT with 25+ years of process instrumentation and control experience in the oil and gas, chemical and petrochemical industry. He became involved in controlling ignition sources including runaway engines after the BP refinery Texas accident in 2005 and has been working with OSHA, Cal OSHA to increase awareness on this potential detonation source that has resulted in numerous deaths and injuries in the hydrocarbon industry.



Title: Controlling Ignition Sources Including Diesel Engines

Abstract: High levels of uncertainty require larger margins of safety. The potential combinations of fuel-hydrocarbons, oxygen-air, and energy-ignition are highly complex; making exact predictions of what is safe and unsafe, difficult and often impractical. The science needed to prove conclusively if combinations near explosive limits will be safe is not yet available. The elimination of ignition sources is a well-known strategy to protect people, investments and the environment from fire and explosions because without the energy to ignite flammable gases, a hydrocarbon release (HCR) incident is far less likely to develop into a catastrophic failure situation. This is not to say that ignition source elimination strategies should act alone. Indeed, elimination of ignition sources must form part of an overall safety strategy. The elimination of the energy (ignition source) can avoid a serious hydrocarbon release becoming a fire and explosion.

A large number of diesel engines (in vehicles, lighting towers, power generators and other equipment) are used in the petrochemical and oil and gas industry for their day-to-day operation. Diesel engine runaway is a serious hazard in oil and gas drilling and production and similar industries where flammable hydrocarbon emissions or leaks may occur. The objective of this presentation is to highlight the importance of ignition source elimination and the differences in approach mandated by law in different jurisdictions around the world. The author will present what companies are doing around the world to eliminate diesel engine runaway as an ignition source in the hydrocarbon industry.

Dr Laurence Cusco

UNIT HEAD WITH RESPONSIBILITY FOR PROCESS SAFETY, HEALTH AND SAFETY LABORATORY, UK



Dr Laurence Cusco is Unit Head with responsibility for Process Safety at the UK Health & Safety Laboratory (HSL). He is a Fellow of the Institution of Chemical Engineers with wide experience of scientific research & development and related business & project management.

He completed a PhD in experimental thermodynamics, sponsored by BP Exploration, at Imperial College London in 1992. He then carried out post-doctoral contract research, also at Imperial, for Shell Petroleum on the blowdown of pressure vessels. He spent two years as a guest researcher at the US National Institute of Standards and Technology where he worked on the thermal conductivity of hydrocarbons and alternative refrigerants and also on the development of viscometers. Prior to joining HSL in January 2000, he worked for over 3 years at the UK National Physical Laboratory where he was project manager for development of new national standards for the thermal properties of molten metals and polymers. He was also lead author of the Institute of Measurement & Control / NPL Guide to the Measurement of Pressure and Vacuum.

Since joining HSL in 2000, he has undertaken and project managed a wide range of projects and incident investigations, including large scale experimental tests with high hazard potential. Range of work includes: chemical reaction hazards, calorimetry, incident investigation, pressure relief systems, safety case assessment, fire protection systems and offshore hazards.

Recent career highlights included serving as one of the six members of the Explosion Mechanism Advisory Board to the Buncefield Major Incident Investigation Board. In 2007 he was winner of the Frank Lees Medal for the best contribution to safety in an IChemE publication for his work on Carbon Capture & Sequestration. In 2010 he was awarded, with co-authors, the Hutchison Medal for his work on interpreting damage from vapour cloud explosions. He is a subject editor of the journal Process Safety and Environmental Protection.

Title: Safety Considerations in Carbon Capture and Storage

Abstract: Climate change concerns have motivated several carbon dioxide capture and sequestration (CCS) studies in recent years. A few of these have been implemented with other major schemes planned globally. Recent work by the UK Health and Safety Laboratory, in collaboration with others including the IEA Greenhouse Gases Program, has identified possible hazards in the CCS process that need to be managed. For example, there are some gaps in knowledge on the behaviour of CO₂ releases from supercritical pressures that make prediction of hazard zones difficult. This is particularly relevant at the high pressures and large volumes envisaged for pipeline transport of and storage within depleted reservoirs.

Calculations using empirical models will illustrate the comparative hazards and risk from potential releases of natural gas and carbon dioxide.

Christopher Dolan

EMERGENCY PLANNING SPECIALIST, QATAR PETROLEUM



Chris Dolan is the emergency Planning specialist for the QP Mesaieed Industrial City. With a diverse background as a police officer in UK and Hong Kong as well as security management in the Sultanate of Oman and the UK. He has been a health and safety practitioner for the past 16 years working in heavy industry manufacturing and local government before moving to QP in 2009. With experience of being a responder to major incidents as well as preparing plans to deal with industrial major incidents he is well aware that planning for emergency response is integral to managing incidents whilst minimizing risk to responders and the public. Chris has a Masters Degree in European Health Safety and Environmental Law and is a Chartered Fellow of the Institution of Occupational Safety and Health (IOSH).

Title: The Institution of Occupational Safety and Health – an overview.

Abstract: IOSH is the worlds' largest professional health and safety institution. Granted a Royal Charter by the UK Privy Council in March 2005, it has over 38,000 members in across the world. In the UK the requirement for employers to employ a 'competent person' to assist them with health and safety the attainment of 'Chartered Status' by members of IOSH is a recognition of competency. With the growing number of safety practitioners in the state of Qatar due to the commitment to improving standards of health and safety throughout its industries and the expected growth in construction due to winning the 2022 FIFA bid there is a growing need for a forum for safety professionals to exchange views and ideas and to continue their professional development. The Institution provides a means for safety practitioners to develop their competencies through meetings and seminars as well as being a forum to exchange views and experience. It also provides employers with a means to ensure that those who they employ as health and safety practitioners have reached certain levels of competency in occupational health and safety and must comply with a professional code of conduct.

Title: Emergency Planning – The Industrial Perspective

Abstract: The number of high value high risk industries within the state of Qatar and the need for employers to comply with safety requirements of the Labour Law 2004 makes the need for emergency planning an essential element of safety in the State of Qatar. The world has seen a number of major industrial accidents which have significantly affected not only the industries concerned but large sections of communities in areas adjacent to the incident. These have been both in terms of fatalities, ill health and injury as well as environmental disasters.

Within Europe Directive No 96/82/EC known as the Seveso II directive as a result of the Seveso Disaster in 1976 creates the requirement for regulating hazardous industries and ensuring that they have in place proper controls and that essential information is communicated to those who would respond to a major incident and those who may be affected by it. Emergency planning addresses more than the need for industries to have an emergency plan to deal with major incidents on site and keep their employees safe. There is also a need for 'off site' emergency planning to address those communities and members of the community who may be affected by a major incident on an industrial site as well as natural disasters and pandemic disease. Emergency responders such as the Qatar Civil Defence Department need to be aware of the hazards and risks posed by industries in order to prepare their response plans and to enable training of their personnel in order to keep them safe whilst responding to a major industrial incident.

Timothy Harding

ASSISTANT MANAGER, HSE PROFESSIONAL COMPETENCE,
PRESENTER ON BEHALF OF THE HSE DIRECTORATE OF
REGULATIONS & ENFORCEMENT, QATAR



Tim Harding is the Assistant Manager HSE professional Competence in the HSE Directorate of Regulations & Enforcement. Tim has been deputed from ConocoPhillips for 3 years where he has worked for over 32 years since 1978 after graduating with an Honors degree in Chemical Engineering from Exeter University. Tim has held petroleum, production, drilling, process, construction, operations engineering and HSE Management positions within major operations and projects working in the North Sea, Venezuela and Nigeria. Tim brings his ability to deliver practical solutions with equal command in health, safety and environmental functions. Tim is on the “other side of the fence” as a HSE regulator and will share his vision regarding assuring HSE risks are “Regulated and Controlled” for the whole of the energy and industry sector of the State of Qatar.

Title: The Directorate HSE Regulations & Enforcement’s current approach to HSE Risk Regulating in the Energy Industry.

Abstract: The Directorate HSE Regulations & Enforcement’s mandated function is to **“Assure HSE Risk is regulated and controlled”** within the energy industry, particularly the petroleum industry. At this same symposium last year, the Directorate introduced itself and the fact that it was in the early development stages. During the past year, the Directorate has learnt much from its assessment of existing Qatari legislation and looking at best industry practices elsewhere in the world. The presentation today aims to update the audience and industry on the Directorate’s proposed approach to better regulating safety risk through the development of a “Safety Case” guideline/regulation combined with an “HSE Management System” guideline/regulation consistent with the industry best practices referred to in Decree-Law No.4 (1977) Preserving Oil Wealth. The ultimate goal is to expand the Safety Case approach to combine the Environmental Impact Assessment and health Risk Assessment.

Doug Hissong

SENIOR ENGINEERING ASSOCIATE, EXXONMOBIL
UPSTREAM RESEARCH COMPANY, HOUSTON, TEXAS,
USA



Doug Hissong is a Senior Engineering Associate in the Facilities Function of ExxonMobil Upstream Research Company in Houston, Texas. He has a bachelor's degree from the University of Cincinnati and a master's degree and doctorate from The Ohio State University, all in chemical engineering. He has been with ExxonMobil for 39 years, the first 6 years in Downstream research and the remainder in Upstream research. He has done research and application work in areas including in-situ coal gasification, physical property prediction, hydrate inhibition, process simulation, and facilities design. Since 1989 he has led the Upstream Research Company's effort in consequence analysis, that is, quantifying hydrocarbon releases, atmospheric dispersion, fires, and explosions. He has developed prediction tools, participated in joint industry projects, provided training, and conducted consequence analysis studies for ExxonMobil Upstream projects world-wide. He is a Senior Technical Professional Advisor in consequence analysis. He also contributes to research on frontier resources such as oil sands and oil shale.

Title: Challenges in Consequence Analysis

Abstract: Predicting possible consequences of accidental hydrocarbon releases involves very complex phenomena including multi-component, multi-phase flow, turbulent mixing, and combustion. Many relatively simplified models have been developed to describe these phenomena, based upon limited experimental data. There is a trend toward more use of more rigorous models, some involving computational fluid dynamics, but time and cost constraints are such that most consequence analysis is done with simpler models. All models require some degree of experimental validation, and large-scale consequence experiments are rare because of cost and safety concerns.

In many areas of consequence analysis, developing relatively simple but realistic models is challenging. For release modeling, it is important to use rigorous physical properties. Basic physics can describe most, but not all, of the phenomena of hydrocarbon plumes rising through water. Modeling of liquid pools is most challenging for spills of rapidly vaporizing fluids like LNG and for spills onto water, particularly for realistic spill conditions with high turbulence between the spilled liquid and the water. Jet fire radiation prediction has a reasonable experimental basis, but little help is available for predicting convection, particularly near the flame tip where it is the dominant heat transfer mechanism. For pool fire radiation, the available correlations for flame height and surface emissive power may not be applicable to the very large fires involved in some scenarios being considered, e.g., large spills from an LNG carrier.

Dr Faisal Khan

PROFESSOR & VALE CHAIR OF PROCESS SAFETY & RISK ENGINEERING, MEMORIAL UNIVERSITY, ST JOHN'S, CANADA



Dr. Faisal Khan is Professor and Vale Research Chair of Safety and Risk Management. He is also Chair of Process Engineering Discipline and Oil & Gas Engineering Board of Studies at Faculty of Engineering & Applied Science, Memorial University, Canada. His areas of research interest include: safety and risk engineering, inherent safety, risk management, and risk-based integrity assessment and management. He is actively involved with multinational oil and gas industries on the issue of safety and asset integrity. In 2008 and 2009, he visited Qatar University and Qatargas LNG Company as Process Safety and Risk Management Chair. In 2006, he has spent few months as risk and integrity expert with Lloyd's Register a risk management organization. He also served as Safety and Risk Advisor to Government of Newfoundland, Canada, Llyod's Register EMEA, SBM Modco, Qatargas and other organizations. He has authored four books, and over 170 research articles in peer reviewed journals and conferences on safety, risk and reliability engineering. He has offered training program/workshop on safety and risk engineering in different places including St John's, Tehran, Dubai, Beijing, Aberdeen, Doha and Kuala Lumpur.

Title: Dynamic Risk Assessment: A Tool for Process Safety Assessment and Management

Abstract: To ensure the safety of a process system, engineers use different methods to identify the potential hazards which in turn lead severe consequences. One of the most popular methods used is quantitative risk assessment (QRA) which quantifies the risk of a particular process activity. The advantage of QRA is it provides valuable information at the starting point of the process life cycle and is useful in the design of a safety system. However one of its major disadvantages is the inability to update the risk during the life of the process. As the process operates, abnormal events will result in incidents and near misses to occur. A conventional QRA process is unable to use the accident precursor information to revise the risk profile.

Dynamic risk assessment is a new approach in process safety assessment and management, which enables the real time failure analysis of a process. Dynamic failure assessment, an element of new approach, has been used in the past by nuclear industries for accident likelihood estimation using accident precursors. Recently it has been successfully applied to process units to revise failure probabilities using incident and near miss data. In dynamic risk assessment advanced probability theories are used to develop a predictive failure model for a given process. As the process operates and generates incidents and near misses, the accident occurrence probability is predicted [using accident precursors] and later used to quantify real time risk. This approach results in a risk profile which is updated with time; it is ideal for accident prevention and dynamic decision making. Real life applications of the dynamic risk assessment in presented here.

Dr Dean Larson

CAPTAIN USN (RET), PRESIDENT OF LARSON
PERFORMANCE CONSULTING, LLC, USA



Dr. Dean Larson had earned a PhD, MA, and BS degrees from Purdue University and MS from the Naval Postgraduate School. Upon graduation from Purdue, he was commissioned in the U.S. Navy, retiring as a Captain thirty years active and reserve service as a Special Operations and Surface Warfare Officer. Dr. Larson served as Manager, Safety and Industrial Hygiene, U. S. Steel Gary Works before he retired in 2003. He is a principal member of the NFPA Technical Committee for NFPA 1600 Standard on Disaster/Emergency Management and Business Continuity and serves as Chair U.S. Technical Advisory Group and Head of the U.S. Delegation for the ISO TC 223 on Societal Security and heads the development of the first ISO standard for exercises and testing ISO/TC 22398. Dr. Larson is a Commissioner on the Indiana Emergency Response and the CEM® Commissions and holds Certifications as Certified Safety Professional (CSP), Certified Performance Technologist (CPT), and Certified Business Continuity Lead Auditor (CBCLA). He consults with Purdue University on emergency preparedness and business continuity and U.S. Steel on emergency preparedness and assessment of security and instructional projects.

Title: NFPA 1600 Standard on Disaster/Emergency and Business Continuity Programs 2010 Edition: An integrated approach to resiliency.

Abstract: NFPA 1600 Standard on Disaster/Emergency and Business Continuity Programs 2010 Edition is the result of twenty years of development by professionals from the public and private sectors and enhanced through five editions. The 9/11 Commission designated the standard as the “National Standard for Preparedness” and the U.S. Department of Homeland Security included this standard in the Voluntary Private Sector Preparedness Program. The United National Environmental Programme (UNEP) has endorsed the standard to be used in tandem with the Awareness and Preparedness for Emergencies at the Local Level (APELL) Program, developed as direct result of Bhopal. NFPA 1600 is unique in the world by combining both Disaster/Emergency Management and Business Continuity into a management standard that can be directly implemented without modification in any country. It is appropriate in the private, public, and not-for-profit sectors to prevent, prepare for, mitigate against, respond to, and recover from natural, man-made, and technological hazards while continuing to provide critical services throughout the disruptive event. Countries in Latin America, Caribbean, North America, and Asia have implemented the standard or have shown strong interest in future implementation.

Roland Moreau

SAFETY, SECURITY, HEALTH AND ENVIRONMENT
MANAGER FOR EXXONMOBIL'S UPSTREAM RESEARCH
COMPANY IN HOUSTON, TEXAS, USA.

VICE PRESIDENT FOR EXXONMOBIL RESEARCH QATAR



Roland Moreau is the Safety, Security, Health and Environment (SSH&E) Manager for ExxonMobil's Upstream Research Company in Houston, Texas, and also serves as Vice President for ExxonMobil Research Qatar. He received his BS degree in Mechanical Engineering from Worcester Polytechnic Institute in 1975, followed by an MBA in Finance from Fairleigh Dickinson University in 1984. He has been with ExxonMobil for over 30 years. Following initial assignments within the Downstream, he has held various technical, supervisory and managerial assignments in the Upstream operations and project business units for ExxonMobil.

Roland's current assignment in ExxonMobil's Upstream Research Company (URC) involve efforts to form a centralized SSH&E organization responsible for developing and supporting implementation of SSH&E programs within the URC organization, as well as managing the strategic environmental and safety technology research activities.

Externally, Roland has served as co-chair of the Management Systems subcommittee for the 2008 and 2010 SPE HSE International Oil & Gas Conferences, and will serve in a similar capacity for the 2012 conference in Australia.

Title: Importance of effective management systems in addressing process safety

Abstract: Many of our operations and products present potential risks to people and to the environment if not managed properly. Recognizing these risks is inherent in our business, and the best way to meet our obligation to conduct our business in a responsible manner is through a capable, committed workforce, and practices designed to enable safety, secure, and environmentally responsible operations.

Recent global events in the oil and gas industry remind us of the challenges we continuously face to improve our operating practices to achieve these objectives. Continuously improving operations integrity relies upon structured, disciplined approaches to manage the safety, security, health, and environmental aspects of our business. These efforts in diligent planning and preparation can prevent or mitigate adverse consequences. Also, each event presents an opportunity to learn the shortcomings in our processes and systems to ensure that the circumstances leading to the incident are not likely to recur.

The focus of this discussion will be to address the important role that management systems play in helping companies to manage risks and also address how we can learn from these events so that the lessons and fixes become an integral part of the industry's fabric.

Dr Tomasz Olewski

RESEARCH ENGINEER, TEXAS A&M UNIVERSITY AT QATAR



Tomasz Olewski was appointed to the position of Postdoctoral Research Associate at Texas A&M University at Qatar at the start of calendar year 2009 and was promoted in 2010 to Assistant Research Engineer. His appointment at Texas A&M Qatar is funded by the BP and Qatar Petroleum sponsored, 5 year project on “LNG safety: advancing the science and technology”. He is on an extended leave of absence from the Process and Occupational Safety Department of the Technical University of Lodz in Poland. He graduated from the Faculty of Process and Environmental Protection, Technical University of Lodz, Poland in 2008 receiving the PhD degree in Chemical Engineering.

Title: The flat-fan water curtain and fences as an LNG vapor mitigation measure – the experiments, analyses and CFD simulations

Abstract: The use of vapor fences and water curtains are widely recognized as the mitigation methods to limit dispersion of vapor created after an accidental release of Liquefied Natural Gas (LNG). Fences are treated as a permanent application whereas water curtains may be used as, both, stationary and portable solution. In case when the LNG is spilled on ground or water, the cold vapor so produced mixes with air and disperses. Many researchers refer that the vapor warms until it becomes positively buoyant. However the predictions of temperature and density for mixtures of natural gas vapor at 162 K and air at 298 K, as a function of molar mixing ratio, presented in this work, shows that the mixture becomes positive buoyant only when the humidity of air is high (>~50%) and even then the buoyancy is not strong. Thus, it has to be concluded that the main mitigation effect of either fences or water curtains is induction of turbulences and thus physical mixing with air, and not warming of LNG vapor itself. Experiments were made at Ras Laffan Industrial City (RLIC) in Qatar using full scale flat-fan two-dimensional water curtains and various type fences including those that incorporate novel designs that are intended to promote turbulence and mixing. Colored smoke was used as a tracer in an air for easier video recording of air movement and turbulences. Air velocities, both upstream and downstream of the barrier were measured using ultrasonic anemometers under a variety of conditions (e.g. wind speed, water flow rate). Computational Fluid Dynamics (CFD) modeling of these experiments provides a direct comparison between the experimental observations and counterpart theoretical predictions. Since 2008 research on LNG safety has been performed at Texas A&M University at Qatar with the sponsorship of BP and additional support by Qatar Petroleum.

Michael Snakard

SR. PRINCIPAL CONSULTANT AND DIRECTOR OF ACUTECH'S MIDDLE EAST SERVICES, ACUTECH CONSULTING GROUP, USA



Mr. Snakard has BS in Chemical Engineering from Villanova University in the US and an MBA from the University of Houston, in the US. He has over 20 years of experience in the design, start-up, troubleshooting and safe operation of industrial plant processes. Mr. Snakard entered the field of process safety after the Phillips 66 explosion in Pasadena, Texas, where, as a young engineer, he was involved in the incident investigation and subsequent redesign of the plant decimated in the incident. Based on his understanding of process safety management principles he later worked as the Process Safety Management Coordinator at a major US refinery in California and over saw the revalidations of the initial HAZOP reports done for the refinery. Since joining AcuTech in February 2010 as a Sr. Principal Consultant and the Director of AcuTech's Middle East Services, Mr. Snakard has been assisting companies in the US, Philippines and Iraq comply with and develop programs to meet US OSHA and OHSAS 18001 process safety requirements. Prior to joining AcuTech, Mr. Snakard was the Qatar Country Manager for URS where, among other things, he led HAZOP reviews, risk assessments and Loss Prevention engineering.

Title: Continuous Safety Improvement (CSI) within a Risk based Process Safety Management Program

Abstract: Process safety standards such as BS8800, The Seveso Directive (Seveso II), and the US OSHA Process Safety Management Standard are performance based rules which establish a set of requirements to achieve compliance with the respective standard. Companies that see these solely as regulatory requirements focus on "What do I have to do?". Those who see these as standards based requirements look to identify "What should I do". It is those companies implementing a risk based approach to process safety management that strive to answer the question, "How can I better manage my risk". Continuous Safety Improvement (CSI) is founded on the basis that goal setting and measurement of progress towards goals for process safety will result in the most effective implementation and management of a process safety management program. This paper explores the use of the CCPS Risk Based Process Safety Management Guidelines and a CSI based implementation program as a means of achieving a sound OHSAS 18001 Occupational Health and Safety Management Systems.

Jon Swain

GENERAL MANAGER, RAS LAFFAN EMERGENCY & SAFETY COLLEGE, QATAR



Born, raised, and educated in Houston, Texas, Jon's first job was with the city of Houston Fire Department (HFD). He served as Captain, Training Officer, EMT, Paramedic, Engine Operator and Firefighter. During his tenure with HFD, he coordinated and conducted certification training for all HFD EMTs and Paramedics. After retiring from HFD, Jon worked at Rowan Companies, Inc. as a Corporate Training Coordinator managing, scheduling, and conducting United States Coast Guard (USCG) approved training for offshore drilling rigs worldwide. That training included survival, firefighting, and rig stability. Other duties included coordinating and conducting rig crew meetings, safety training, and rig safety inspections for personnel in the UK, Scotland, the Netherlands, Canada, Singapore, Indonesia, Africa, and USA. Joining The Texas A&M University System's Texas Engineering and Extension Service's (TEEX) Emergency Services Training Institute (ESTI) in 1992 as an instructor in the Marine Firefighting and Safety Program, Jon was soon promoted to a Program Director. In that capacity his duties included: managing, scheduling, and delivering U.S. Department of Homeland Security programs including Incident Management/Unified Command, Emergency Medical Services, and Hazardous Materials Response to CBRNE incidents; supervising and evaluating training managers, instructional, and field support staff; managing multi-million dollar budgets and enterprise programs; along with overseeing course development, certification, and revisions. Jon's training and managerial experience in emergency response in the oil and gas industry, both foreign and domestic merged with his close ties to the emergency response communities are an excellent combination for his position as general manager of RLESC.

Title: Ras Laffan Emergency and Safety College - The facility of the future

Abstract: This presentation will provide a description and overview of the Ras Laffan Emergency and Safety College (RLESC). The presentation will include the intent, purpose, description, and scope of training to be offered as well as the current status of this state of the art, world class training facility being constructed in Qatar. You will be provided with information and descriptions of the overall facility, the training props and their utilization, certification of the training provided and an opportunity to ask questions to the TEEX General Manager.

Dr Luc Véchet

ASSISTANT PROFESSOR OF CHEMICAL ENGINEERING AT
TEXAS A&M UNIVERSITY AT QATAR



Dr. Luc Véchet obtained a PhD in Chemical Engineering from the École Nationale Supérieure des Mines de Saint-Étienne (France) in 2006. He then joined the Fire and Process Safety Unit of the Health & Safety Laboratory (HSL) in Buxton (United Kingdom) where he held the position of Process Safety Engineer for 3.5 years. Dr Véchet joined the faculty at Texas A&M University at Qatar in September 2010 as an Assistant Professor of Chemical Engineering where he took over the lead of the Process Safety activities at the university. Dr. Véchet has worked on process safety related research topics for the last 7 years in collaborations with universities, public laboratories and industries. He focused his researches on exothermic reaction hazards and calorimetric hazard screening techniques, runaway reactions and adiabatic calorimetry, pressure relief design applications for untempered peroxide systems and accidental releases of water reactive chemicals. His current research activities include a major 5 year project on LNG safety sponsored by BP.

Title: Process Safety Research activities at Texas A&M University at Qatar

Abstract: Over the last four years, the Chemical Engineering Department of Texas A&M University at Qatar has had some research activities on the major field of Process Safety. This presentation will give an overview of the main research areas and projects that are currently active and under development at the University in collaboration with international key research institutions active in the field of process safety. One of the main research areas has been LNG Safety research. This research is funded with a five year grant from BP (2008-2013) and also supported by Qatar Petroleum. The main objectives of the project as well as the recent advances will be presented. Texas A&M University at Qatar has also been expanding its research activities to the particular area of chemical reaction hazards. State of the art calorimetry facilities for studying exothermic reactions under both intended, and runaway, conditions have been developed. A brief overview of the projects involving the use of such calorimeters will be given. This includes the development of a project aiming at improving the current pressure relief system design for the safe manufacture, storage, transportation and handling of untempered unstable substances or chemical mixtures (e.g. peroxide compounds, pharmaceutical intermediates). A particular attention will be paid to the involvement of undergraduate students at Texas A&M in the above project thus contributing to raise their safety awareness and to develop a safety culture via research activities.

Dr Simon Waldram

RETIRED, PREVIOUSLY PROFESSOR OF CHEMICAL ENGINEERING AT TEXAS A&M UNIVERSITY AT QATAR



Dr Simon Waldram trained as a chemical engineer in both the UK and USA and obtained his PhD from University College London, University of London where he was a faculty member for 21 years and where he remains an Honorary Reader. He was appointed Technical Director of Hazard Evaluation Laboratory, later to become HEL, in 1992 and subsequently was appointed Director for Business development. He was responsible for 970 process consultancy projects and reports during his 15 years at HEL. He has made a number of overseas visits to India and Bangladesh as a specialist lecturer with the British Council. He joined the faculty at Texas A&M University at Qatar in 2007 where he led the Process Safety activities at Texas A&M Qatar including a major 5 year project on LNG safety sponsored by BP. He retired in December 2010. Dr Waldram is author of more than 100 publications, many in the safety related fields and is an expert in calorimetry and runaway reactions.

Title: Are we serious about learning lessons from incidents?

Abstract: Most process engineers are committed to the principle of learning lessons from incidents – both their own and those of others. This paper will, with the aid of simple examples, illustrate that as a professional community of process engineers we fail to do this sufficiently well. A radical re-think is required if we are to do better. This requires cooperation and leadership on an international scale as well as vision, and generous funding, for a skilled and dedicated team of analysts.

Dr. Mike Wardman

LEADER THE MAJOR HAZARDS TEAM, FIRE AND PROCESS SAFETY UNIT, HEALTH AND SAFETY LABORATORY, BUXTON, UK



Dr Mike Wardman received his BEng and PhD degrees in chemical engineering from the University of Sheffield in the UK. He worked for WS Atkins for 3 years before joining the UK Health and Safety Laboratory (HSL) in 1999. HSL is an agency of the UK health and safety regulator, HSE. Mike leads the Major Hazards Team at HSL. His recent work has involved leading HSL's input to the development of societal risk tools and criteria for land-use planning. Mike has also been involved in HSE's land-use planning methodology for flammable pipelines. He has also worked on carbon capture and storage projects and has worked in the field of hydrogen safety, including a number of European collaborative projects.

Title: Societal risk representation for effective risk communication

Abstract: Clear representation of societal risk is important for effective risk communication. The context of the representation is important in relation to whether it is being applied to land-use planning or regulation/ enforcement. Some of the ways that societal risk can be represented for major hazard sites is considered. Alternative and less resource-intensive methods are used to generate data that is used in combination with Geographic Information Systems (GIS) for the population aspects. Traditional graphical and numerical representations are presented, as are newer geographical representations.

The Second Texas A&M at Qatar Safety Symposium

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