



Effective management
of health, safety,
environment
and sustainability: sharing
international good practice
and learning

Middle East HSE and Sustainability Forum

Conference Report

1-3 October 2018
Mövenpick Hotel & Apartments
Dubai, UAE

Middle East HSE and Sustainability Forum

1 - 3 October 2018

Mövenpick Hotel and Apartments
Dubai, UAE

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CONFERENCE REPORT

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The Energy Institute Middle East HSE and Sustainability Forum

Sharing experience and good practice from around the Middle East



The EI hosted delegates from the GCC's public and private sectors at the second EI HSE Forum. Building on the success of last year's event, 2018's forum included a full day for sustainability in addition to HSE topics.

Day 1

Day 1 kicked-off with a welcome by the Conference Chairman, Hari Kumar. He was followed by speeches from H.E. Andrew Jackson, Her Majesty's Consul General, British Embassy Dubai, Ms Louise Kingham OBE FEI, Chief Executive, Energy Institute, H.E. Saif Humaid Al Falasi FEI, Chief Executive Officer, ENOC and a presentation focusing on ENOC in the Year of Zayed, 2018. The first morning panel had as its theme the value of adopting international HSE good practice, followed by utilising collaboration to drive regional HSE good practice, with the afternoon sessions encompassing process safety and technology, closed out with roundtable discussions and panel Q&A; both were well attended and involved discussion and shared experiences.

Building on the success of last year's event, 2018's forum included a full day for sustainability in addition to HSE topics.

Day 2

The second day of the forum began with welcome remarks from Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC and Chairman, EI. The first of the day's sessions was about the importance of collaboration between the energy industry, academia and professional institutions for development, diversification and growth. The second session addressed the industry's role in delivering energy safely, preventing harm to employees, contractors, local communities and environment. The afternoon's sessions were focused on the environment.

Day 3

Day 3 was chaired by Dr Tadhg O'Donovan, Associate Head of School, Engineering & Physical Sciences, Herriot-Watt University; its theme was sustainability. The morning started with a keynote speech from H.E. Ahmad Buti Al Muhairbi, Secretary General, Dubai Supreme Council of Energy on Dubai's 2030 integrated energy strategy and DSCE roadmap. The first session looked at methods of achieving energy efficiency and resource conservation through policy, retrofitting and awareness programmes, the challenges of urbanisation and other related topics. The afternoon saw case studies and presentations on environmental reporting, the use of sustainable and green building materials, as well as the sources and uses of biofuels. ●

Welcome remarks from Mr Hari Kumar, Director EHS Assurance, ENOC

Building and maintaining a powerful HSE culture is essential to achieving safety and environmental goals

Mr Hari Kumar welcomed the attendees and presenters and expressed his wishes that the event would prove fruitful. His opening remarks addressed the challenges of sharing best practices and the role of the conference in providing opportunities for HSE practitioners to meet, raise relevant issues, describe achievements in safety, health management and environmental performance and offer others the benefit of their experience. He highlighted the importance of building and maintaining an

HSE culture and the challenges in doing so; transformation in terms of practices, assumptions, processes and results is essential, but must be managed carefully by a committed leadership. Mr Kumar closed by emphasising that the forum benefits HSE practitioners and companies who are starting on the transformation journey. ●



Hari Kumar, Director EHS Assurance, Emirates National Oil Company (ENOC)

Welcome remarks from Mr Andrew Jackson, Her Majesty's Consul General in Dubai

The UK has, and will continue to, lead in its support for sustainability and world class professional and standards bodies

Mr Andrew Jackson, Her Majesty's Consul General in Dubai, spoke of the importance of HSE, the need for professional standards to support effective HSE performance and the role that the UK plays through professional associations such as the EI, and the UK's global reach. Mr Jackson commented on the successful collaboration between the UK and UAE in the energy sector, and the ways in which the UK's new export strategy will strengthen the relationship. He added that the relationship is particularly important to sustainability and the cooperation between British

and Emirati research institutes towards finding solutions in energy conservation and the use of sustainable resources. ●



Mr Andrew Jackson, Her Majesty's Consul General in Dubai

KEYNOTE SPEECHES

Welcome remarks from Ms Louise Kingham OBE FEI, Chief Executive, Energy Institute

The EI's history of success in the Middle East attests to the importance of creating communities of practice, sponsoring research and providing opportunities for certification



Louise Kingham OBE FEI, Chief Executive, Energy Institute

Ms Kingham began with the EI's purpose, to promote knowledge and provide certification in energy-related disciplines and subjects. More importantly, the EI raises the bar for people in the industry, driving global good practice and technical terms of reference for the industry. The EI is growing in the Middle East as industry personnel are increasingly aware of the benefits, and in many cases the need, for continuous learning and development in building their careers. The EI collaborates with UAE and regional institutions and entities

who aim to occupy leadership roles in the energy sector, whether they be nuclear, oil and gas or alternative energy suppliers, service providers or integrated companies. Changes in the industry, such as increasing adoption of alternative energy sources, pose challenges to maintaining expertise and ensuring that best practices remain effective. The EI leads and assists in the creation and sharing of knowledge that enables organisations and individuals to lead successfully in this environment. ●

Keynote address from H.E. Saif Humaid Al Falasi FEI, Chief Executive Officer, ENOC

Fostering operational excellence, governance and world-class EHS standards



H.E. Saif Humaid Al Falasi FEI, Chief Executive Officer, ENOC

His Excellency described ENOC's role in the UAE's transition to a low-carbon economy and the company's involvement with the EI. Concerning HSE, he explained ENOC's strategy of embedding HSE as a core value, giving it priority and centrality in the corporate culture and strategy.

ENOC has successfully set and achieved HSE performance benchmarks, emphasising the need for clear, defined targets, and has set objectives for zero HSE violations.

Among the initiatives that the company has launched to achieve its ambitious goals and reflect HSE priorities

along its value chain are the ENOC culture, safety metrics, the streamlining of near miss and incident reporting with a dedicated app, and sustainability programs for energy conservation, waste elimination and efficiency improvements. Solar powered smart fuel stations that send power back to the grid are an example. The company's progress in this regard is attested by the Institute of Director's Golden Peacock award to ENOC, but, as His Excellency reminded the audience, the safety journey does not end. Today's standards are set and achieved, to be exceeded in the future. ●

Presentation: Year of Zayed in the United Arab Emirates

ENOC commemorates the UAE's Founding Father and his remarkable legacy with a host of initiatives reflecting his timeless values

To commemorate His Late Highness, Sheikh Zayed bin Sultan Al Nahyan in the year of his centenary (the Year of Zayed), ENOC launched Corporate Social Responsibility (CSR) initiatives from July to August, in a range of areas that target the environment, sustainability, local communities and education, among others.

Ms Hamda Al Masoum, CSR Executive, ENOC, described each CSR program, highlighting ways in which they reflect the themes of the Year of Zayed (culture and knowledge, wisdom, respect, environment and sustainability and human development).

A program has been implemented to encourage people to return plastic bottles for recycling into clothing. To support women, ENOC collaborated with Union Cooperative in a reward scheme. The ENOC Energy Scholarship supports high-potential UAE national school students, and the ENOC social hub highlighted the importance of the nation and community. ●



Hamda Al Masoum, CSR Executive, ENOC



Celebrating the Remarkable Legacy of UAE's Founding Father (Slide 1)

THE VALUE OF ADOPTING INTERNATIONAL HSE GOOD PRACTICE

Integrating occupational health, industrial safety and environment safety standards

HSE integration and the successful inculcation of the safety culture was cemented with the implementation of BAPCO's OEMS



Ahmed Khalil, HSE Manager, BAPCO

Mr Khalil described BAPCO's Fire and Safety (F&S) function's journey towards achieving outstanding levels of performance. Initially, fire and safety were treated as the responsibility of F&S alone. Compounding this situation was a shortage of resources in F&S itself and a focus on personal, as opposed to process and environmental safety. With the establishment of its HSE Management System, BAPCO was able to assign responsibilities across the company for safety and to make personal safety management part of each business process.

Leaders were engaged in HSE initiatives, evaluated on the results and involved in improvements. This was critical to creating a culture of ownership for safety results. BAPCO looked not only at the energy sector for examples of good practice, but also to other industries. HSE integration and the successful inculcation of the safety culture was cemented with the implementation of BAPCO's OEMS. Mr Khalil reminded the audience that while has certainly accomplished a great deal in the last few decades, the journey never ends. ●

The value of adopting international HSE good practice

Insights into how the right HSE focus and the use of data from experience can be used to make significant improvements in HSE performance



Jamal Zaal, Vice President, Corporate Health, Safety, Sustainability and Environment, Dubai Airports

Mr Zaal's address provided insights into how the right HSE focus and the use of data from experience can be used to make significant improvements in HSE performance – in this case, emergency response time at Dubai Airports. While setting and achieving HSE targets is laudable in itself, it is particularly relevant to Dubai International Airport, where millions of passengers arrive, depart and transit each day; passenger and visitor experience is critical to Dubai's reputation as a safe, secure destination. The improvements – specifically in the time taken from identifying an incident to delivering the victim to hospital – were the

result of looking carefully at how employees perceived and reported incidents, the incident reporting structure and the team involved in contacting the emergency services. Using other international airports as benchmarks, Dubai Airport studied various scenarios, changed processes, provided awareness and training to employees and set ambitious goals for simplifying and reducing the overall response time. A small improvement, perhaps, but one that potentially has considerable impact on the Airport's ability to deliver on its corporate mission. ●

Legal considerations for risk and safety professionals in the UAE

Given that sub-contracting and outsourcing are common practices in industry, companies may make the mistake of assuming that risk and responsibility for safety can also be outsourced

Ms Ellaby addressed the legal context in which HSE practitioners operate. Ms Ellaby explained that its potential impacts on organisations need to be understood and taken account of in HSE planning. The main point of the presentation was the ownership of risk and liability for the occupational health and safety of employees, contractors and others at work sites. Given that sub-contracting and outsourcing are common practices in industry, companies may make the mistake of assuming that risk and responsibility for safety

can also be outsourced. This is not the case, as the owner or employer will ultimately be liable for any damages unless contracts specify otherwise. By highlighting the potential legal consequences of carelessness or poor HSE practices, Ms Ellaby's presentation was a reminder that good, professional HSE management, particularly in contractor HSE matters, safeguards not only people and processes but companies as well. ●



Samantha Ellaby, Senior Associate, Clyde & Co

Presentation: Utilising collaboration to drive regional HSE good practice

Continuing in its 100-year mission, the EI has a valuable role to play along the energy industry's value chain, with technical guidance documents applicable from design to decommissioning

Dr Scanlon's speech gave the audience an overview of the Energy Institute's value to HSE practitioners as a facilitator of cooperation, emphasising the EI's role as that of "honest broker" – a learned society, not a trade association. Because of its independence, the EI can conduct research, serve as a platform for practitioners and academics and provide organisations and whole industries with guidance and professional qualifications, leveraging its network of experts and corporate and individual members. The value of collaboration for building HSE good practice in

organisations comes from access to current, evidence-based research findings, technical guidance documents and test methods and of course the members. Continuing in its 100-year mission, the EI has a valuable role to play along the energy industry's value chain, with technical guidance documents applicable from design to decommissioning. Because the EI's work is member-driven, industry practices can be challenged, and best practices improved. In addition, the EI offers unparalleled opportunities for industry professionals, not just in HSE, to develop. Dr Scanlon

concluded with examples of the kind of knowledge that the EI can provide in process safety, occupational health and other subjects of interest to the audience. ●



Dr Mark Scanlon
MEI, Head of HSE
Good Practice,
Energy Institute

HSE MANAGEMENT: ORGANISATIONAL ARRANGEMENTS TO IDENTIFY HAZARDS, REDUCE RISKS AND ENHANCE BUSINESS PERFORMANCE

Are you getting the full value of your investment in safety?

It's not about doing more on safety: it's about doing the right things on safety!



Gareth Roberts, Partner, ERM

Mr Roberts began by describing a survey that ERM Worldwide Group undertook to assess what managers saw as current safety trends, their investments in safety and how they perceived the returns on that investment. The survey was taken by 144 managers and directors in 22 countries, across diverse sectors such as technology, agriculture and mining. The organisations surveyed had a combined annual revenue of over USD 4 trillion. Responses indicated the following trends: considerable stakeholder emphasis on safety; tougher

regulatory environments; increased migration of risk to contractors; and growing investment in safety. The survey highlighted issues in contractor management, the use of lagging and an emphasis on training. He concluded with the survey's main finding – there is no evidence to suggest that increased spending on safety leads to improved results. More important are practices such as leadership commitment, the use of data and technology to measure results, setting valid targets and addressing the causes of incidents and safety issues. ●

Creating a global high reliability organisation by rethinking the safety paradigm: a case study

To change safety-related behaviour we first need to understand the cultures and beliefs of our employees



Rakesh Maharaj CMIOSH, Managing Director, ARMSA Consulting

Mr Maharaj opened his presentation with a review of what could be called the standard assumptions and components of work, where HSE is concerned: regulation; enforcement; training; working conditions; tools and equipment; and pay. In other words, organisations assume that if these items are in place and are managed, safety will be taken care of. Mr Maharaj presented the results of a study indicating that these standard assumptions – the paradigm – are incorrect and that if safety is to be achieved, a different perspective is required. The findings indicate that it is the

basic culture and beliefs of the people in the organisation that determine safety outcomes, regardless of regulations, management action or working conditions – though clearly, they all play a role. Mr Maharaj left the audience with much food for thought: to change safety-related behaviour we first need to understand the cultures and beliefs of our employees; people who are not brought up to think of safety are unlikely to start in adulthood. ●

HSE MANAGEMENT: ORGANISATIONAL ARRANGEMENTS TO IDENTIFY HAZARDS, REDUCE RISKS AND ENHANCE BUSINESS PERFORMANCE

Learning to lead, safely!

Saudi Aramco downstream business line's journey to leadership safety engagement - bring focus to HSE and to make section heads and other leaders accountable for HSE performance

Mr Bresden presented an account of the development and implementation of Saudi Aramco's Downstream HSE Excellence Group DS HSE Excellence Group, formed in 2016 to bring focus to HSE and to make section heads and other leaders accountable for HSE performance. A study was undertaken to measure leadership engagement in HSE. A methodology was developed to capture employee perceptions and quantify the level of cultural engagement, across operational departments. The findings

indicated the following areas for potential improvement: leadership engagement; accountability; HSE leadership skills; HSE communications; task delegation and lessons learned. While the study's outcomes might be perceived as common, or to be expected, the results showed the value of in-depth research utilising quantitative and qualitative methods to ensure valid and reliable findings as a basis for decisions about improvement initiatives. ●



Roger Bresden, Field Compliance Coordinator, Downstream HSE Excellence, Saudi Aramco

Contractor safety management with fatality case study

While nobody is against safety, per se, companies defeat their own safety objectives if they appoint only the cheapest contractors and do not enforce rigorous safe working practices and compliance

Mr Tan's subject encompassed the challenges of ensuring that contractors work safely. He introduced his presentation by describing an incident that took place in the Philippines, involving a painting contractor taking safety shortcuts that resulted in the death of a painter. Root cause analysis during incident investigation revealed the following contributing factors: lack of knowledge; inadequate tools/ equipment, standards/ specifications; inadequate maintenance of standards; and compliance monitoring. Additional factors included

failures in emergency response planning, but most significantly, poor contractor selection and management processes. In conclusion, Mr Tan pointed out that while nobody is against safety, per se, companies defeat their own safety objectives if they appoint only the cheapest contractors and do not enforce rigorous safe working practices and compliance. The emphasis should be on choosing only complying bids and remembering that there is no such thing as a "sub-contractor". ●



Carlos Tan, Assistant Vice President, HSE Group, Energy Development Corporation (Philippines)

PROCESS SAFETY: MANAGING HAZARDS THAT HAVE THE POTENTIAL TO CAUSE MAJOR ACCIDENTS

Hazards caused by neglecting surge pressures in pipelines at the design stage

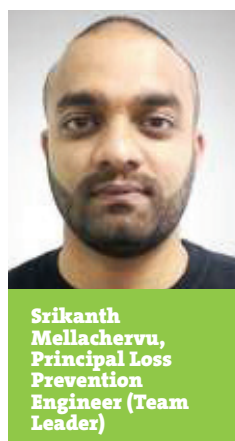
General surge issues and Hydraulic Analysis Group incident investigations and case studies



Glyn Addicott CEng MEI, Operations Director, Hydraulic Analysis Limited

Mr Addicott explained the work of the Hydraulic Analysis Group: since 1970, it has undertaken almost 10,000 projects in 50-plus countries. One subject that the Group has studied is pressure surge, the change in fluid velocity that leads to changes in pressure, typically in pipes, causing damage to valves and fittings, and ruptures in pipes. The Group has investigated process safety incidents resulting from surge pressures and has found that lack of understanding of hydraulics and the potential for pressure surge-related

damage lead to operational errors resulting in damage to equipment. Clearly, given that these incidents are common, design and engineering are not enough: reliable process safety must involve operators who understand process risks related to hydraulics. ●



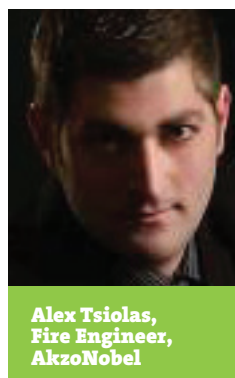
Srikanth Mellachervu, Principal Loss Prevention Engineer (Team Leader)

Optimisation of passive fire protection scheme

A practical approach for standardised upstream oil and gas facilities using fire and structural engineering concepts

Mr Mellachervu and Mr Tsiolas provided the audience with detailed, practical information about their approach to optimisation. It included analysis of each steel structure, optimisation to critical core temperatures and the assignment of material thickness to reduce weight. The results of optimisation have potential benefits across sectors. The adoption of performance-based passive fire protection schemes over prescriptive schemes can improve project schedules for brownfield projects challenged by field shutdown constraints, shorten fabrication and commissioning schedules for

greenfield projects and reduce the weight of materials applied to structures. ●



Alex Tsiolas, Fire Engineer, AkzoNobel



PROCESS SAFETY: MANAGING HAZARDS THAT HAVE THE POTENTIAL TO CAUSE MAJOR ACCIDENTS

Fire and gas detection optimisation

A practical approach for standardised upstream oil and gas facilities using fire and structural engineering concepts

Dr Bengherbia began by reminding the audience of the purpose of fire and gas (F&G) detection systems and their importance to safety in hazard detection, alerting people and initiating action. F&G systems also carry significant capex and opex, so optimisation can create financial efficiencies without compromising safety. Optimisation starts with F&G mapping studies to define where detectors should be placed, select the best type of detector and how many are required. Gas mapping

models gas leak points and associated risks. Scenario-based mapping works best, because it identifies how gas will be dispersed around the facility. Dr Bengherbia concluded by emphasising the use of 3-D modelling methods and preliminary mapping to optimise the number and location of detectors; this prevents unnecessary spending without increasing risk. ●

Scenario-based mapping works best, because it identifies how gas will be dispersed around the facility.



Dr. Tarek Bengherbia,
Principal
Consultant, DNV
GL

Smart safety systems: improving health and safety performance

The power of artificial intelligence to drive health and safety improvements in the Oil & Gas industry

This presentation explained the uses of artificial intelligence (AI) in understanding the causes of incidents and failures and thus making safety improvements. IBM Watson is IBM's suite of enterprise-ready AI services, applications and tooling. It has ingested over 30 years' worth of data, and over 80,000 records. Woodside Petroleum has used Watson to improve its HSE performance by taking advantage of Watson's vast data processing capabilities to analyse cause-and-effect and other relationships. While AI may be well known in engineering, operations and



control systems, its adoption in reducing incidents and enabling employees to work safely is still beginning. ●



Dariusz Piotrowski,
Director,
Cognitive &
AI Solutions
Development,
IBM Industry
Platforms,
Natural Resources
Industries, IBM



Shannon O'Rourke,
Head of Commerciali-
sation, Woodside
Petroleum

PROCESS SAFETY: MANAGING HAZARDS THAT HAVE THE POTENTIAL TO CAUSE MAJOR ACCIDENTS

Q&A and closing remarks

Chaired by Dr Mark Scanlon MEI, Head of HSE Good Practice, Energy Institute

Questions to the panel members focused on aspects of process safety, engineering standards applicable to F&G systems and hydraulics, the effects of operator error on safety and Watson's applications in the offshore safety context.

Risk assessment and hazard identification is typically the responsibility of the HSE function.

By involving stakeholders from design, operations, maintenance and other groups, more and better information can be obtained, and the importance of safety can be emphasised.

Business performance improves when operations run successfully; as HSE practitioners know, incidents can have enormous cost, so lowering risk levels helps to ensure business performance.

Hazards are managed through effective design and engineering, choosing the right materials, change management during construction and safe operations and maintenance. By involving process safety at the earliest stages, during Hazop studies, for example, the potential for accidents (such as those coming from pressure surges) can be reduced, if not eliminated. Dr Scanlon

summarised the afternoon's technical presentations and commented on the way in which different disciplines and specialisations bear on safety.

In the future, AI will be used more widely in the energy sector and it is expected that its impacts will be far-reaching.

Equally importantly, as data and analysis become less expensive and easier, root cause analysis and our understanding of factors in safety will improve. ●



ROUNDTABLE DISCUSSION

Managing change, using technology, legal compliance and governance for occupational safety and health (OSH) and process safety

Management of change from the HSE perspective

The roundtable participants discussed the importance and challenges of managing changes in organisations that can affect the occupational health and safety of employees, contractors and visitors as well as process safety. Good change management consists of design reviews, studies (e.g., HAZID and HSEIAs) and well-defined hierarchies for approving changes. **Abdullatif N Albitawi CEng MEI SFIIRSM, COO, EAGLE Industries, DWC-LLC**

Managing safe and effective commissioning: using computer, simulation to overcome unforeseen challenges during system, start-up and commissioning

Commissioning can involve multiple parties, complex work schedules and process safety hazards as fluids are introduced into systems. The roundtable discussed a case study that focused on unforeseen process and equipment safety hazards associated with starting up hydraulic systems. IT solutions were proposed and discussed for providing data and risk



Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC

models when managing safe start-up and commissioning in hazardous environments. **Glyn Addicott CEng MEI, Operations Director and Dermot Grumley, Engineering Director, Hydraulic Analysis Limited**

Challenges facing UAE companies trying to meet the different legal HSE requirements

This discussion followed on from Ms Samantha Ellaby's presentation about compliance with HSE legal and regulatory requirements. Questions and suggestions addressed the difficulty of keeping up to date with changes in requirements

and the challenge of achieving compliance with laws and rules that can be vague or lacking in detail. Specific regulatory and compliance environments were mentioned, and Ms Ellaby was able to provide answers and guidance in where participants could go for more information. **Samantha Ellaby, Senior Associate, Clyde & Co.**

Developing the leadership and governance assurance standards in occupational safety and health

Following ongoing research and work relating to ISO 45001 (Standard for Occupational and Health Management Systems), in particular Article 5.1 of the Standard, this roundtable investigated what an effective model for governance and leadership of occupational safety and health issues might consist of, and how it could be applied. **Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC and Chairman, Ei Middle East Branch and Council Member, Energy Institute**



Abdullatif N Albitawi CEng MEI SFIIRSM, COO, EAGLE Industries, DWC-LLC



Glyn Addicott CEng MEI, Operations Director and Dermot Grumley, Engineering Director, Hydraulic Analysis Limited



Dermot Grumley, Engineering Director, Hydraulic Analysis Limited

ROUNDTABLE DISCUSSION

The value of risk assessment, HSE analytics and at cost-benefit approach to planning and implementing HSE initiatives



Samantha Ellaby, Senior Associate, Clyde & Co



Jason Woods,
Middle East
& India
Representative,
IPAF

How good is your risk assessment?

The purpose of risk assessment is to eliminate or reduce the probability of an incident occurring. Ideally, more time and effort in risk assessment increases the assurance that all possible risks have been identified, such that they can be addressed, and hazards avoided or eliminated). This roundtable focused on how risk assessment can be applied effectively to working with Mobile Elevating Work Platforms (MEWPs). The goal was to share knowledge about effective equipment planning, the kind of operator training necessary for safe use of MEWPs and emergency planning for rescues at height. **Jason Woods, Middle East & India Representative, IPAF**



Ian Loveday,
Senior Partner,
EMEA O&G Lead,
ERM

The future of health and safety in a digital world

Woodside Petroleum has improved its operational safety outcomes by using Watson's powerful analytics capabilities. Watson works fast, mining decades worth of safety data in seconds. This allows safety practitioners to compare root causes and effective risk mitigation strategies. During this roundtable, Woodside and IBM shared details of Watson's use in HSE and AI's potential for increasing the benefits from collaboration among HSE professionals.

Dariusz Piotrowski, Director, Cognitive & AI Solutions Development, IBM Industry Platforms, Natural Resources Industries, IBM, Shannon O'Rourke, Head of Commercialisation, Woodside Petroleum

Next generation HSE: from a perceived cost to value generator

This roundtable focused on perceptions of HSE in the participants' organisations, particularly with reference to the cost of HSE and its role in generating value. Additional topics included the integration of HSE into business operations and what the participants saw as the next steps. Digital transformation was discussed as one of the ways in which integration could be better achieved. **Ian Loveday, Senior Partner, EMEA O&G Lead, ERM**

Welcome remarks and keynote address from Dr Waddah S Ghanem FEI

The importance of collaboration between the energy industry for the future development, diversification and growth

Dr Ghanem began his presentation with an overview of how industry in general has driven urbanisation, power and water technologies and plant construction, created employment and, indirectly, resulted in secondary, tertiary and service sectors. More recently, alternative energy sectors have been created, as part of a technological and information revolution in distributed and non-asset based economies.

Academia has been involved in projects funded or commissioned by industry players and has benefited from research grants.

Areas where industry has supported research include augmented reality, artificial intelligence, pharmaceuticals, with frequent, in-depth contacts between the two spheres helping to revitalise engineering disciplines. In recent years, specialist institutions such as the UAE's Masdar Institute have arisen, and engineering programs, particularly at master degree level are increasingly narrow in scope. A promising sign for continuing collaboration, which will no doubt lead to more specialisations, is the growth in the numbers of industry practitioners who are looking for advanced degrees or certification in their disciplines. Research and cooperative studies have led to and will continue to produce results in safety and environmental fields such as evidence-based health research, incident research in loss prevention, cross-



company and multi-country lessons learned sharing and the development of communities of practice, benchmarking and performance assessment methods and standards.

The EI plays a special role in promoting, supporting and facilitating this kind of cooperative work by engaging with institutions during events (such as the HSE Forum), involvement in joint research projects, creating and sustaining communities of practice and making current, important information available to members, whether they are from industry or academia.

This includes outreach to the next generation of engineers, practitioners and specialists through the establishment of awards programs and participation with colleges and universities. Dr Waddah concluded by emphasising the contribution that collaboration has made to industry and to the

wider community, and the EI's role in helping to build stronger industries. ●



Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC

KEYNOTE SPEECHES

Presentation: The Energy Institute in the Middle East

In terms of membership, the Energy Institute has 20,000 individual members 250 corporate members worldwide



Trevor Stott-Briggs, Managing Director, Energy Institute Middle East Branch

Mr Stott-Briggs presented the Forum with a detailed briefing on the EI's history, its presence in the Middle East, the role it plays in the industry and plans for the future.

The EI is the chartered professional membership body bringing global energy expertise together.

It is a unique network with insight spanning the world of energy, from conventional oil and gas to the most innovative renewable and energy efficient technologies. The global energy industry, the people working in it and wider society all benefit from the EI's work. The EI gather and shares essential knowledge about energy (a collection of over 90,000 resources as well as research support), provides the skills to use it more wisely, and develop the good practice needed to keep it safe and secure (technical guidance documents and research papers). The EI has 13 local branch networks in the UK and seven international branches, comprising the Middle East, Hong Kong, Nigeria, Ireland, Malaysia, Singapore and the Caribbean.

In terms of membership, the EI has 20,000 individual members, 250 corporate members worldwide. Given that the EI-Middle East Branch has only been established since 2012, its growth and impact in the region has been significant.

Mr Stott-Briggs explained the different company membership types (Company, Technical Company and Technical Partners) and the benefits

that EI affords its members – individual and corporate. These include professional development and qualifications (from undergraduate to chartered status), networking, learning and knowledge sharing and member discounts on training, events and technical publications. The EI has three professional grades, at which individual members can join, providing a development framework: Technician Member (TMEI), Member (MEI) and Fellow (FEI).

The EI recognises energy professionals through offering professional membership grades and chartered registrations. It provides support through member workshops, informal mentoring at branch events and MyCareerPath, an online professional development tracking tool.

The EI Technical Programme consists of over 100 technical committees (including industry, technology, academia and

regulatory bodies) working on mutually agreed projects that deliver knowledge in HSE, energy efficiency, renewables, process and operational procedures and other subjects. At a combined cost of about USD 2 million, independent audits have shown the EI's Good Practice programme to have a return on investment of between 35:1 and 140:1 to Good Practice Partners. EI events include International Petroleum (IP) Week, the EI Awards, the industry's most established awards programme, Middle East HSE & Sustainability Forum, branch events organised directly by EI-Middle East and participation in major exhibitions and conferences as ADIPEC, WFES, GOTECH, Saudi Electricity Forum and UK-UAE Energy Council events. The EI also collaborates with and supports other energy sector organisations such as IIRSM, IOSH, NEBOSH, SKG, Emirates GBC, CEBC, IPAF and ADSG. ●



THE INDUSTRY'S ROLE IN DELIVERING ENERGY SAFELY, PREVENTING HARM TO THEIR EMPLOYEES, CONTRACTORS, LOCAL COMMUNITIES AND ENVIRONMENT

Health and welfare: a view from the power sector

Operating in the desert environment exposes workers to natural hazards such as heat, dust, scorpions and even contact dermatitis from plants

Mr Mark Kenyon introduced Marubeni's involvement in the power generation sector, covering gas, LNG, hydro, solar and installations using other energy sources. He then focused on occupational health and safety hazards specifically arising in solar plants. While solar sites share some of the same hazards as traditional power plants, there are others that solar operators need to be aware of. Nitrogen trifluoride and sulfur hexafluoride are used in solar cell manufacturing and breaches of containment can result in the release of potent greenhouse

gases. Operating in the desert environment exposes workers to natural hazards such as heat, dust, scorpions and even contact dermatitis from plants. Other significant hazards include glare from panels, increased working temperatures and radiation. While solar energy may address concerns regarding the use of fossil fuels or nuclear sources, the solar value chain brings its own share of OHS risk, which owners and operators need to take into account in design and operation and maintenance planning. ●



Mark Kenyon MIIRSM, HSSEQ Manager, Marubeni Power Asset Management

HSE related to drilling operations for oil and gas

HSE performance is assured through a combination of training and awareness, well-defined responsibilities, procedural clarity and improvements based on human factor analysis

Mr Adil Khalil's presentation focused on HSE and OHS hazards and risks in drilling operations. After an introduction to the purpose of drilling and the facilities, equipment and activities that are typically involved, he introduced HSE by looking at safety-critical systems and equipment, such as hoisting, circulating, rotating and power systems, and the hazards that they pose to people, processes and plant integrity. Work in a drilling rig needs to start with establishing HSE integrity, through procedures, induction, environmental awareness and PPE rules. Secondly, hazards must be identified systematically

through formal risk assessments. Common HSE incidents on a drilling rig include fires and explosions, transport and lifting or hoisting accidents, caught in machinery or crushed by equipment, and equipment failure, besides the usual trips, falls, cuts and abrasions.

Occupational injuries and illnesses consist of burns, amputations, skin disease and death from explosion or other traumas.

Causes of incidents, injuries and illnesses include failure to follow procedures, lack of defined and assigned ownership of safety, staff turnover and failures to communicate at shift handover, as well as simops and other

reasons. HSE performance is assured through a combination of training and awareness, well-defined responsibilities, procedural clarity and improvements based on human factor analysis. ●



Adil Khalil, Oil and Gas Coordinator and Member of Board, Energy Institute Middle East Branch

THE INDUSTRY'S ROLE IN DELIVERING ENERGY SAFELY, PREVENTING HARM TO THEIR EMPLOYEES, CONTRACTORS, LOCAL COMMUNITIES AND ENVIRONMENT

How the Emirates nuclear power program ensure public and environmental safety

The nuclear energy sector is one of the most regulated industries worldwide but there is more to achieving safety than establishing rules. A culture of safety is necessary



Eng Marwan Alkindi, Director of Environment and Sustainability, Nawah Energy Company

The Emirates Nuclear Energy Corporation (ENEC) and its operational subsidiary, Nawah Energy, have embedded a culture of safety, with active stakeholder engagement, into each phase of the project. ENEC's responsibility for the environment extends to the land and sea bordering the site; because of the nature of nuclear energy generation, ENEC's responsibility for the safety of the community encompasses towns and villages in all areas that may be affected by HSE incidents such as releases arising from breaking of containment.

Safety was incorporated into the facility's design, following international standards, and has been applied during construction. Compliance with reporting requirements and the use of data and performance monitoring have been maintained to ensure that at each phase, the environment and the needs of the community have been addressed. Engr Al Kindi said that this emphasis will continue during operations; regular stakeholder communication ensures that community members are informed of events; training keeps employees focused on safety in every process. ●

How to create a resilient and productive workforce

Investing in employee health starts with establishing health surveillance programs and health monitoring, in order to identify health hazards and implement controls



Dr Ola Ahmed Mira, Director OHS and Head of Radiation Protection Centre, Ministry of Health Abu Dhabi (MOH)

Employee health is the first basis for employee productivity. Illness results in absence, sub-standard performance and the costs associated with replacing people who cannot work effectively. Investing in employee health starts with establishing health surveillance programs and health monitoring, in order to identify health hazards and implement controls (e.g., noise levels, ergonomics, air quality).

Many health problems are not work-related.

However, we should not forget that employees spend less than half their time at work – many sources of common health problems that affect people at

work are not occupational but are the result of poor education, bad habits and unhealthy living, in general. Companies can motivate their employees to improve their health through awareness campaigns to address smoking, diet and exercise, free, onsite medical checks (e.g., for blood pressure or diabetes) and, if necessary, building fitness levels into job requirements. Dr Ola concluded that while there are costs attached to doing this, studies indicate that there are long-term savings, particularly as employees age. In other words, spending to encourage better health is a genuine investment. ●

THE INDUSTRY'S ROLE IN DELIVERING ENERGY SAFELY, PREVENTING HARM TO THEIR EMPLOYEES, CONTRACTORS, LOCAL COMMUNITIES AND ENVIRONMENT

Q&A and closing remarks

Chaired by Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC



Dr Waddah S Ghanem FEI, Senior Director Sustainability, Operational and Business Excellence, ENOC

Questions concerned strategies for raising employee awareness of health issues, how occupational health monitoring can be implemented in small companies and ways in which occupational injuries can be prevented through design as well as operational controls. The problem of absenteeism as a result of occupational illness and poor employee health in general was noted, and participants raised concerns from their experience. Questions also addressed specific HSE issues arising from drilling and operating in the desert. Panel members provided advice and noted that leadership and clear hazard communication were essential. ●



HEALTH: MANAGING HEALTH HAZARDS AND REDUCING HEALTH IMPACT ON WORKERS

Barriers to Return to Work (RTW), Middle East experience

RTW programs benefit employees, by reducing financial loss, and employers, by helping to maintain continuity and productivity



Dr Jose Villanueva, Specialist Occupational Medicine, NMC Specialty Hospital

Dr Villanueva's presentation started with a definition of "Return to Work" (RTW): enabling employees to return to work while they are still in recovery from occupational injuries and illnesses. RTW programs benefit employees, by reducing financial loss, and employers, by helping to maintain continuity and productivity. While the case for RTW is easy to accept, it is not common practice in many companies, for a variety of reasons: employees resist it, feeling that returning to work may slow their recovery;

employers do not have policies or facilities to allow RTW cases to return to site (e.g., no wheelchair access); insurance and lack of treatment facilities are other factors. Dr Villanueva presented two case studies where RTW was found to be successful for employee and employer, in the context of Biopsychosocial medicine. This approach looks at physical and psychological health, as well as the social context, and is necessary if RTW policies are to be implemented successfully. ●

Human performance and Shell's Care Program

Care involves ensuring that the actions of management and employees improve opportunities for growth, autonomy, purpose and inclusion

Mr Pols introduced his talk by describing highlights of Shell's Care Program. Research demonstrates that where companies implement engagement, incident rates drop. The basis for Shell's approach is understanding the organisation's psychological capital – people's optimism, resilience, hope and self-efficacy. The program channels these into accountability, productivity and other outcomes, of which safety is one. Care involves ensuring that the actions of management and employees improve opportunities for growth, autonomy, purpose

and inclusion. This creates a work environment to enable performance, but also safety and quality of life. As part of Care, people challenge their own thinking and choose behaviours that will impact positively on everyone and on the company's performance. ●



Thomas A H Pols, Health Manager Middle East & North Africa, Royal Dutch Shell

The basis for Shell's approach is understanding the organisation's psychological capital – people's optimism, resilience, hope and self-efficacy.

HEALTH: MANAGING HEALTH HAZARDS AND REDUCING HEALTH IMPACT ON WORKERS

BAPCO's wellbeing model: from theory to practice

BAPCO's wellbeing project 2020 scheme involves representation at board level and leadership commitment at all levels in the company

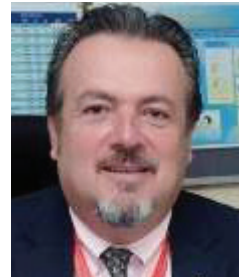
BAPCO's wellbeing project 2020 aims to provide all employees with a healthy working environment. The scheme's structure involves representation at board level and leadership commitment at all levels in the company. Formalised with a vision, long-term goals, the Osool BAPCO values, defined actions and metrics, the project is supported by ambassadors – volunteer employees who carry the project's message, values and

methods to the rest of the workforce. Social media and in-company channels are used to promote the project and its benefits.

A health and wellbeing checklist for each employee includes medical screening, the person's medical history, consultation and a treatment plan.

The project also provides for interventions in employees' health, driven by ambassadors, bringing health awareness and

opportunities for improvement to the staff. The project is evaluated through a monitoring framework. Critical to its success are employee engagement, communication and leadership, commitment and support from managers. ●



Dr Spyridon Trous, Manager Medical Services, BAPCO

HUMAN FACTORS: DESIGNING JOBS AND EQUIPMENT TO SUIT A WIDE RANGE OF USER ABILITIES AND LIMITATIONS

Knowledge transfer partnership project

A picture speaks a thousand words: raising hazard awareness on construction sites by designing training materials for a multicultural workforce

Ms Houette presented the results of a two-year project involving Robert Gordon University and Petrofac International. The project's objective was to increase the understanding of safety issues on construction sites where a multicultural workforce operates and develop management practices to address safety performance. The project contributed to changes in supervisory training, designing safety award guidelines and training materials to increase hazard awareness. The research found a range of factors resulting in unsafe behavior: high risk tolerance, lack of

awareness of safety hazards, low English proficiency, wide differences in skills and experience, illiteracy and different understandings of instructions and expectations. The project team was able to revise training materials to address the issues that had been identified. Ms Houette gave examples such as using pictures rather than verbal descriptions; using employees' native languages in training sessions; and engaging employees in ways that make sense to them. New training methods and materials have been deployed at several Petrofac sites. ●

The project contributed to changes in supervisory training, designing safety award guidelines and training materials to increase hazard awareness.

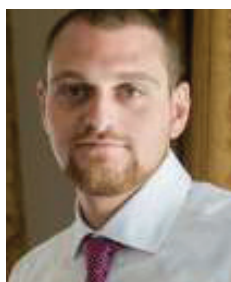


Beate Houette, KTP Research Associate, Robert Gordon University

HUMAN FACTORS: DESIGNING JOBS AND EQUIPMENT TO SUIT A WIDE RANGE OF USER ABILITIES AND LIMITATIONS

Complacency: its signs, causes and cures

Complacency kills. Complacency is a feeling of contentment or self-satisfaction, especially when coupled with an unawareness of danger



**Islam Adra MEng,
CRSP, CMIOSH
HSE Manager
MENA & TURKEY**

Mr Adra explained why complacency, specifically in the HSE context, is dangerous to hazard identification, risk assessment and control. He gave definitions and examples of complacency, showing how the mind adjusts to routines and common occurrences, using assumptions rather than observing and checking. Of particular interest was the way in which the probability of an incident increases over time, as people change from being focused to being complacent, and start taking shortcuts. Given that complacency is

an attitude, it needs to be addressed from a variety of angles. Antidotes include last minute risk assessments (LMRA), procedures, tightened inspection regimes, job rotation and enrichment, and investigation, even of near misses. Close supervision of employees also helps, as does training. ●

Complacency, specifically in the HSE context, is dangerous to hazard identification, risk assessment and control.

Process safety compliance in a cross cultural context (when rules are not enough)

Even where systems are well thought-out and training is provided, poor execution can undermine them



**Michael Nates
CEnv GradIOSH,
Managing
Director, Nates
Associates**

Mr Nates' presentation addressed how process safety performance, a function of systems in place and their execution, can best be achieved in multinational, cross-cultural contexts, a situation familiar to companies operating in the Middle East and MENA regions. He highlighted a common disconnection between HSE teams, responsible for standards and procedures, and operation and maintenance (O&M) teams, charged with implementation. Even where HSE systems are well thought-out and training is provided, poor execution

can undermine them (what Mr Nates calls "the state of operational effectiveness"). National cultures can be broadly classified on scales under various parameters, such as egalitarian-hierarchical or consensus-confrontational. Combined with the personalities of people at work, these cultures tend to drive behaviours such as how we communicate, whether we ask questions of those in authority or how we deal with uncertainty. Mr Nates provided an illustration called the "HSE culture ladder" showing a maturity scale of

company self-perceptions of HSE implementation and performance and explained how the predominant national cultures in organisations can affect their ability to achieve higher levels of performance (in effect, "climbing the ladder"). ●

HUMAN FACTORS: DESIGNING JOBS AND EQUIPMENT TO SUIT A WIDE RANGE OF USER ABILITIES AND LIMITATIONS

The BowTie lifecycle process in ADNOC Sour Gas

ADNOC sour gas plans to extensively use the BowTie Process for risk management throughout the lifecycle of its assets

Dr Prashanth and Mr Verboom began the presentation with a description of ADNOC Sour Gas, its operations, and the challenges in working with highly toxic H₂S. Dr Prashanth explained some of the difficulties in traditional use of the BowTie model for risk management – it is often applied in isolation from other risk-related exercises, and without enough detail, adding little value. He also described the successful application of the BowTie model to ADNOC

Sour Gas's project lifecycle, starting at the Front End Engineering Design (FEED) stage, through detailed design and into operations. Technical authorities are involved at the engineering phases, threats are analysed in detail, HSE critical systems and equipment are identified and controls are reviewed and customised as the project moves forward. Plans for strengthening the use of the BowTie include highlighting the responsibilities of people in charge of safety critical

equipment and integrating the model into SAP for dynamic risk assessment, connected to the company's plant performance management systems. ●



Dr Ignatius Prashanth, Senior Engineer HSE (Technical Safety) ADNOC Sour Gas | Arjan Verboom, Program Director, CGE Risk Management Solutions

ENVIRONMENT: PROCESSES AIMED AT AVOIDING AND MITIGATING ENVIRONMENTAL IMPACTS

EAD: Self-Monitoring and Reporting Regulations (SMART)

While inspection can obtain useful information, it is resource intensive

Environment Agency Abu Dhabi's (EAD) mandate requires the capture of data on the state of the UAE's environment and activity with potential impact on the environment, such as noise and releases. Self-monitoring and reporting is a program for cooperation between reporting entities and the EAD. Monitoring can include direct inspection of a facility or of environmental conditions near a facility. While inspection can obtain useful information, it is resource intensive. Condition monitoring is also resource-intensive and findings are not

always reliable indicators of facility activity or violations. Self-monitoring provides the kind of data that EAD needs, focuses a facility's attention on compliance and is far less resource-intensive than inspection. The disadvantage is that it relies on the facility for accuracy. An alternative is citizen monitoring, but the results are often inconsistent. The self-monitoring and reporting program is implemented through environmental regulations and covers three types of activities: those with liquid discharges, with emissions to the atmosphere and / or waste

generated from processes. The program will support EAD as a leader in environmental sustainability by providing reliable data on pollutants, changes in the environment and the creation of an environmental database, which can be used to produce reports. At the policy level, these reports will help decision makers. ●



Eng Ahmed Al Jassmi, Section Mgr, Hazardous Materials & Waste Policy & Regulations, Environment Agency - Abu Dhabi



Mohamed Alam, Sr Specialist, Air, Noise & Climate Change Policy & Regulations, Environment Agency - Abu Dhabi

ENVIRONMENT: PROCESSES AIMED AT AVOIDING AND MITIGATING ENVIRONMENTAL IMPACTS

Waste management challenges and opportunities in oil and gas industry

ADNOC deploys best available technologies for treatment and reuse of drilling and production wastes to ensure zero discharge to environment



Saud Al Hammadi
Technical HSE
Manager, ADNOC
Onshore

ADNOC operates along the entire oil and gas value chain, from upstream to downstream. Many of its activities generate industrial and hazardous waste that potentially harms the environment. Apart from the need to comply with regulations and conserve resources by recycling and reusing waste, ADNOC has a moral obligation to protect employees, the community and natural environment from potentially harmful effects of waste, and its reputation as an industry leader demands that it set an example in this area.

ADNOC's HSE Management System (HSEMS) is governed by policies and objectives and implemented through codes of practice, procedures and guidelines.

ADNOC Onshore implements HSEMS waste management requirements through produced water disposal, oil-based mud reconditioning, sewage treatment, recovery of oil from sludge by decanting and strategies for treating Naturally Occurring Radioactive Materials (NORM). ADNOC's BeAAT facility is a centralised operation for waste treatment, recycling and disposal,

and includes solidification, incineration and landfill facilities. Although ADNOC has developed processes and methods for waste treatment/disposal, challenges remain: planned increases in oil and gas production will generate more waste, such as produced water, contaminated sand, batteries, drilling waste, NORM and oil sludge. In addition, e-waste (such as old computers) needs attention because there are no treatment facilities for it. As a result, ADNOC is exploring new technologies to ensure sustainability along the value chain. ●

Bio fuels: an environmentally friendly alternative to fossil fuels

Biofuels are a useful alternative to disposing of products such as used cooking oil in landfills



Rahul Shastry Garimella
SIIRSM, Director,
Integrated EHS
Consultants

Biofuels are made from ethanol or biodiesel, produced from biomass materials such as sugar, vegetable oil, fats and greases. They are blended with conventional fuels and offer a way of decreasing dependency on fossil fuels. Thus, they have a potential benefit for reducing pollution – particulates, hydrocarbons and CO emissions. Biofuels are a useful alternative to disposing of products such as used cooking oil in landfills. In the long term, advanced biofuels can provide a sustainable solution for reducing carbon use in transport and aviation fuel. Programs to collect used cooking oil

for biofuel production are in place in Europe, and biofuel consumption is common in the USA. Leading auto manufacturers have modified engine design to accommodate blended fuels and marine transport now uses biodiesel blends containing up to 20 percent biofuel. In the UAE, the RTA Green Project has led to the conversion of buses to biodiesel and ENOC supplies B5, a blended fuel to the local market. Companies, such as Macdonalds and Imdaad are using biodiesel in their trucks and Sustainable City UAE – Middle East has adopted biofuel for the construction of its new Phase 2 buildings. ●

In the UAE, the RTA Green Project has led to the conversion of buses to biodiesel and ENOC supplies B5, a blended fuel to the local market.

ENVIRONMENT: PROCESSES AIMED AT AVOIDING AND MITIGATING ENVIRONMENTAL IMPACTS

Q&A and closing remarks

Chaired by Steve Major CPetEng FEI, President, Energy Institute Middle East Branch

Questions were addressed to the panel concerning compliance with regulations and ways in which self-reporting programs could be introduced to companies. One point raised by several participants was the need for clarity in guidelines and reporting schedules. Waste management is a common concern, with companies keen to do more but uncertain about how programs can be implemented technically and justified commercially. A third topic discussed was how risk assessment can be more effective in identifying barriers,

and the problems of tracking changes in operations that can impact barriers. ●



Steve Major CPetEng FEI, President, Energy Institute Middle East Branch

ROUNDTABLE DISCUSSIONS

Programmes for returning to work and applying barrier management to occupational and process safety

Combatting mental health issues and instituting programmes for returning to work

The round table discussed ways of breaking the stigma attached to mental health issues. Employee mental health is not well understood in the energy industry and is not addressed in training courses for HSE professionals. Mental health problems are actually quite common, and most of us are in regular contact with people who have mental health issues, even though we do not realise this. As the leading cause of employee absenteeism, mental health deserves much more detailed study and response.

Mark Leary CMIOSH,

Vice Chair, IOSH UAE Branch

Occupational safety versus process safety: can they be managed in the same manner using “barrier management” as the common denominator?

While occupational and process safety are critical elements of HSE management systems they need different types of risk assessments and application (e.g., process safety starts with design controls, whereas occupational health has a more operational focus). This roundtable looked at methods and techniques that can be used to ensure that both are addressed at the design and operational phases, with risk assessment as a starting

point. Barrier management is applicable to both safety domains, but not as a one-size-fits-all approach.

Arjan Verboom, Program Director, CGE Risk Management Solutions.

As the leading cause of employee absenteeism, mental health deserves much more detailed study and response.



**Mark Leary
CMIOSH,
Vice Chair,
IOSH UAE Branch**



**Arjan Verboom,
Program
Director, CGE
Risk Management
Solutions**

ROUNDTABLE DISCUSSIONS

Ecological opportunities, workplace safety, leadership and the adoption of renewable energy



Dr Bassem Nassouhy,
General Manager,
Scientific
Business
Solutions (SBS)



Day 2 Roundtable Discussions chaired by: Steve Major CPetEng FEI, President, Energy Institute Middle East Branch



Dr Clarence Rodrigues,
Associate
Professor and
HSE Engineering
Degree Program
Coordinator,
Khalifa
University

Waste to energy: industrial ecology opportunities in the energy sector

This roundtable discussed the reuse and recycling of industrial wastes, such as that from oil and gas operations, the aluminium industry, old tyres and solid municipal waste. Comments encompassed possible uses of waste, the costs of recycling and repurposing and ways of involving local companies in the waste-to-energy cycle. **Dr Bassem Nassouhy, General Manager, Scientific Business Solutions (SBS).**

Ergonomics and human factors for workplace safety and health

Participants discussed the role that ergonomics plays in instances of occupational illnesses and injuries. Examples included issues in the design of equipment and office furniture. Human factors such as error, carelessness and lack of awareness of safe working practices are a constant problem

at workplaces; participants raised these issues and agreed that bringing safety controls into design and engineering are essential to addressing both issues. **Dr Clarence Rodrigues, Associate Professor and HSE Engineering Degree Program Coordinator, Khalifa University**

How to make a difference: how can leaders become better advocates and influencers in health and safety?

Good health and safety leadership requires management's commitment and ability to influence the organisation's HSE culture. It also needs understanding of human behaviour and perceptions of safety. The participants shared their experience of developing HSE leadership and the role that qualifications and certification can play. **Dr David Towlson CMIOSH, Head of Qualifications and Assessment, NEBOSH**

Why is renewable energy not as popular in the UAE as Europe and the USA?

The discussion focused on the question why, with 330+ days sunshine and extreme temperatures, solar power and heat turbines are not common in the UAE, despite government-led emphasis on renewables. Suggestions included the relatively low cost of fossil fuels for power generation, the cost of refitting existing utilities or building new plants, and ecological conditions such as the presence of sand in the air that compromises the value of sunlight. Contributors agreed that technical issues can be resolved over time, but any significant transition in energy sources will need to be driven from the top. **Steve Major CPetEng FEI, President, Energy Institute Middle East Branch**



Dr David Towlson
CMIOSH, Head
of Qualifications
and Assessment,
NEBOSH

Welcome remarks from the Chair and keynote addresses

Managing demand, controlling emissions and achieving goals for sustainability and efficiency require strategic leadership and the application of technology and ingenuity

Dr O'Donovan, Associate Head of School, Engineering & Physical Sciences, Herriot-Watt University welcomed the attendees to day 3 and introduced the day's topics: sustainability and energy efficiency. He presented a summary of the subjects that would be discussed and described Herriot-Watt University's involvement in both areas, in terms of education and research. ●



Dr Tadhg O'Donovan, Associate Head of School, Engineering & Physical Sciences, Herriot-Watt University

Dubai's 2030 integrated energy strategy and DSCE roadmap

Keynote address from H.E. Ahmad Buti Al Muhairbi, Secretary General, Dubai Supreme Council of Energy

His Excellency introduced and summarised the Dubai Integrated Energy Strategy (DIES) roadmap and the progress made towards Dubai's goals. The strategy commits Dubai to securing uninterrupted energy supply, moderating the emirate's growing energy and water demand, and increasing the sustainability and competitiveness of Dubai's economy. It was deployed in 2011 and, following significant global and local developments, revised in 2015 with a goal of 75% clean energy by 2050. The revision encompassed the development of a fundamentally new clean energy mix and e-mobility program, review of the Demand Side Management

Strategy (DSM), and a holistic assessment and consolidation of all programs, implementation roadmaps and performance management systems. The DSM strategy is a flagship program of DIES 2030. It aims to reduce Dubai's electricity and water consumption by 30% by 2030. The DIES has key enablers such as fostering an environment conducive to innovation and discovery, promoting R&D into new technologies and building supportive policy and regulatory frameworks. DIES 2030 is also facilitated through funding and financing for key projects and exploring models for public-private partnerships (PPP) and independent power producers (IPP). ●



H.E. Ahmad Buti Al Muhairbi, Secretary General, Dubai Supreme Council of Energy

ENERGY TRANSITION: HOW ARE WE DRIVING OUR BUSINESS STRATEGY IN CONTEXT OF CLIMATE CHANGE – WHERE ARE THE RISKS AND OPPORTUNITIES

The importance of retrofitting in reducing Dubai's energy demand

To date, Dubai's energy market has seen total financial savings of AED 93 million, with CO2 abatement of 135 tons, 194 GWh of electricity saved and 132 MIG of water



Dennis Peek, HSE Manager, Etihad ESCO

Mr Peek introduced Etihad ESCO and its mandate to develop energy efficiency projects targeting more than 30,000 buildings in Dubai through the creation of a performance contracting market for energy service companies.

Considerable gains have been made in reducing consumption and costs through retrofitting buildings.

To date, Dubai's energy market has seen total financial savings of AED 93 million, with CO2 abatement of 135 tons, 194 GWh of electricity saved and

132 MIG of water. 5 million m2 have been retrofitted, including about 2,500 facilities. The average ROI period, meaning the time taken to achieve savings on power costs, is 48 to 72 months. Etihad has worked on governmental, residential, commercial and educational structures. ●

Carbon emissions management

Dubai Carbon is part of the Dubai Green Energy Programme (GEP), which aims to enable the growth of green technologies, products and services in regional markets



Ivano Iannelli, CEO, Dubai Carbon Centre of Excellence

Dubai Carbon Centre of Excellence (Dubai Carbon) was established in 2011 as a partnership between DEWA, ENOC, Dubai Holding and Empower. It was established to lead Dubai's transition to a low-carbon and green economy. Dubai Carbon is part of the Dubai Green Energy Programme (GEP), which aims to enable the growth of green technologies, products and services in regional markets.

Through education, outreach and incentives, Dubai Carbon is generating awareness and knowledge.

Dubai Carbon has established the Carbon Ambassadors

Programme, a platform for users to view and purchase pre-verified energy and water-consumption products, and a tool for stakeholders to assess their own sustainability indicators. All three initiatives (and there are others) help to consolidate knowledge that supports the GEP. ●

ENERGY TRANSITION: HOW ARE WE DRIVING OUR BUSINESS STRATEGY IN CONTEXT OF CLIMATE CHANGE – WHERE ARE THE RISKS AND OPPORTUNITIES

Future ready! Adapt and transition to sustainable energy economies and eco-systems

There is a need for cities to adapt and transition to sustainable energy economies and eco-systems

Mr Wronowski addressed the need for cities to adapt and transition to sustainable energy economies and eco-systems. The matter is urgent because of demographics (rising concentrations of population in cities through urbanisation), pollution levels (a consequence of crowding) and other factors such as carbon emission levels and greenhouse gas build-up. The transition has to start with government-level policy supporting radical changes in energy use along

the value chain from generation to consumption. This starts with energy efficient design for buildings, transportation systems, urban facilities and domestic housing, followed by retrofitting existing structures and systems to enable the use of renewable sources. Also essential are demand-side conservation and a pricing model that encourages energy saving. Clean sources such as batteries and solar plants are a priority, but they need to be connected through a

smart grid to optimise load management and distribution. New technologies for billing, metering and usage monitoring are also essential parts of the strategy. ●

The transition starts with government-level policy to support radical changes in the use of energy.



Marcin Wronowski,
Sustainability
& Energy Senior
Consultant, WSP

From the very small to the very big: how particle physics can change the world

Future developments include the potential for miniaturisation and in-well measurement, increasing operators' visibility into feed and processes



Dr Hassard introduced the application of particle physics to the energy industry, specifically for the analysis of profiling oil in wells. The objective is to develop a real-time oil and water profile, identifying the contents present in oil and water samples using a particle physics multi-sensor for proteomics. The device / method can map very small quantities of aromatics, bacteria, metals, H₂S, mercaptans and other materials. Profiles are useful at upstream and downstream phases for quality control, determining production allocation, process control settings and configuration. The technology enables full component analysis in real time. ●



Dr John Hassard,
Co-Founder,
Institute of Security,
Faculty of Natural Sciences,
Imperial College
London

ENERGY TRANSITION: HOW ARE WE DRIVING OUR BUSINESS STRATEGY IN CONTEXT OF CLIMATE CHANGE – WHERE ARE THE RISKS AND OPPORTUNITIES

Q&A and closing remarks

Chaired by Dr Tadhg O'Donovan, Associate Head of School, Engineering & Physical Sciences, Herriot-Watt University



Dr Tadhg O'Donovan,
Associate Head
of School,
Engineering &
Physical Sciences,
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University

Questions concerned the DIES, potential savings from retrofitting buildings and the management of carbon emissions. Answers covered the need to focus long-term when evaluating energy savings models and the consequent cost efficiencies; building a business case for ESCO projects is challenging if owners look only a couple of years ahead. Equally important is leadership from the public sector -- as demonstrated by DIES -- in educating consumers and

encouraging the private sector to adopt new building standards and designs. ●



SUSTAINABILITY: PROCESSES AIMED AT SUSTAINABILITY

Transformation of sustainable energy: the new era of efficiency and optimisation

Dubai has created a smart strategy to manage demand, diversify fuel sources, secure supply and foster green growth



Taher Diab, Senior Director, Strategy & Planning and Secretary General of Emirates Energy Award, Dubai Supreme Council of Energy

The Emirate of Dubai is one of the fastest growing cities in the world, with a forecasted electricity demand for the next decade increasing at five to six percent annually. Therefore, demand-side management (conservation) and efficiency are a top priority for Dubai's Green Agenda. Dubai has created a smart strategy to manage demand, diversify fuel sources, secure supply and foster green growth. The Dubai Sustainable Energy Model has delivered a robust regulatory framework and has attracted international and regional investors to achieve the lowest levelised

cost of electricity (LCOE) for a 200 MW solar photovoltaic (PV) power plant. Dubai's sustainable energy model has 10 pillars, encompassing a policy and regulatory framework, initiatives for building capacity, diversification, demand-side management, pricing, investment in clean energy and smart technologies, stakeholder engagement, public-private partnerships, energy services contracting and a carbon abatement strategy. While each of these is useful on its own, together they form a concerted, unified program for achieving Dubai's sustainability goals. ●

The role of green materials in boosting sustainability in UAE industry

The ready-mix concrete industry can be a key contributor to meeting environmental goals through alternative materials

Dr Kashwani began with an overview of the green materials cycle, as it is applied to buildings: sustainable construction is required to meet rising demand for buildings in an increasingly regulated context. The ready-mix concrete industry can be a key contributor to meeting environmental goals through alternative materials. For example, Ground-granulated Blast-furnace Slag (GBSS), a byproduct of iron recycling, can be used in concrete mixes to reduce CO2 levels. Each ton of additional cementitious material

saves measurable quantities of raw material. Fly ash is another byproduct of industry that can be recycled into building materials. Cement Based Composite Materials (CBCMs) are another component that can reduce dependency on traditional materials, generating savings and reductions in emissions. Adoption of alternative materials is essential to avoid the harmful effects of construction, recycle waste from other industries and achieve the needs of a rising population for residential and commercial construction. ●



Dr Ghanim Kashwani CEng CEnv, Postdoctoral Research Associate, New York University Abu Dhabi (NYUAD)

How to report on the Sustainable Development Goals: what good looks like and why it matters

Reporting SDG achievement contributes to a rich source of data that can be used by government policy makers and other organisations involved in sustainability initiatives

Sustainable Development Goals (SDGs) were launched by the UN in 2015. Their objective is to provide a set of standard criteria for sustainability programmes. Reporting SDG achievement contributes to a rich source of data that can be used by government policy makers and other organisations involved in sustainability initiatives. Ms Hanife Ymer explained what a good SDG report should contain, and the status of SDG reporting in the UAE. KPMG applies nine reporting criteria across three categories: understanding the SDGs, prioritising action and measuring performance

against the criteria. So far, five percent of the UAE's largest organisations are submitting SDG reports.

The most prioritised SDGs in the UAE are “climate action”, “decent work and economic growth” and “good health and well-being”.

Ms Ymer recommended a four-phase approach to building a reporting programme: understanding within the company of the SDGs and their relevance to the business; agreement on which SDGs to prioritise; appropriate performance targets and metrics; communication. ●



Hanife Ymer, Head of Sustainability Services, KPMG Lower Gulf

SUSTAINABILITY: PROCESSES AIMED AT SUSTAINABILITY

Overview of renewable energy deployment in the Arab region

The case for adopting renewable energy in the Arab region, given urbanisation and the potential impacts of power generation and desalination



Dr Raed Bkayrat, CEO, Clean Energy Business Council

Over 50 percent of the Arab world's population already lives in cities; the number is expected to rise over the next few decades, as is the demand for power and water. Given that cities are the main source of CO₂ and other contributors to global warming and considering the potential environmental impact of power generation and desalination, there is a strong case to be made for adopting renewable energy in the Arab region. Dr Bkayrat provided statistics showing

the extent of adoption of solar and other renewable energy sources in the region, the solar project pipeline and plans for transitioning to clean energy use. Of particular note is the rapid increase in investment in renewables since 2008. Challenges remain, such as legal and regulatory frameworks governing clean energy, but cities such as Dubai have taken essential steps towards establishing a "big picture" approach to the transition away from dependence on fossil fuels, traditional transportation and energy management. ●

ENERGY EFFICIENCY: PROCESSES AIMED AT ENERGY EFFICIENCY

ISO 50001:2018 for the Petroleum Industry

A basis for partnership between operating companies and EPC contractors for successful implementation

ISO 50001:2018 is an energy management system standard. It provides a blueprint for achieving continual improvement in energy use. Petrofac is a leading EPC contractor, serving energy sector owners and operators around the world. Mr Mustafa Vahgijpurwala's presentation focused on how owners and EPCs can work together to achieve energy savings along the value chain (i.e., from FEED, contractual terms and contract management through to operations). Examples include performance guarantees (EnPIs), energy credits for EPCs, emphasis on reducing the life-

cycle costs of built assets and a bonus-penalty component applied to energy savings. Energy audits at the start and end of a project can be used for formal verification of potential energy savings during operations, and facility energy profiles can be provided to EPCs at FEED stage.

Additional action can include assessing the energy implications of facility expansion and flexibility in design.

When it comes to monitoring, measuring and trending, active energy management can save up to five percent, but metrics

and methods need to be built into the project, starting at design stage. Where necessary, benchmarks should be used for realistic assessments of potential savings, and targets should be revised when necessary. Critical to achieving the potential gains from this cooperative approach is an active energy management team on the client side, ensuring that efficiency goals and practices, as well as savings from design and construction, are passed on to operations. Given the contributions that EPCs and owners can make together, cooperation around shared goals is essential. ●



Mustafa Akberi Vahgijpurwala
MEI, Senior
Engineer,
Petrofac

ENERGY EFFICIENCY: PROCESSES AIMED AT ENERGY EFFICIENCY

ENOC energy and resource efficiency: the story so far

The Energy and Resource Management (ERM) Programme creates a full-cycle management system along ENOC's value chain

The Energy and Resource Management (ERM) Programme has three pillars: social; economy and environment for delivering sustainable value. The programme is aligned with Dubai DSM Strategy 2030, which covers buildings, water conservation, standards and lighting, among other areas. The ERM addresses energy use within ENOC and for its customers and suppliers – thus creating a full-cycle management system along ENOC's value chain.

ENOC established an ERM policy in 2009, as a first step towards implementing the programme.

This was followed with energy audits, KPIs, ERM plans and training and embedding energy and resource management in business units. Governance is assured through the Sustainability Leadership Committee, to which the Group Sustainability Office and various sub-committees report. Plans for identifying and addressing significant energy uses (SEUs) are established and reviewed quarterly for KPI achievement. ●



Saravanan Dhalavoi Pandian, Senior Sustainability Specialist, ENOC

Compressed air systems: saving energy and increasing reliability

Start at the design stage by understanding operational needs, compressor selection criteria, air treatment requirements and pipe sizing and layout

Compressed air systems provide opportunities for reducing energy use while improving equipment reliability. Mr Albitawi explained the need to start at the design stage by understanding operational needs, compressor selection criteria, air treatment requirements and pipe sizing and layout. Considerations such as VFD/VSD installation, heat recovery, pipe re-sizing and integration to the DCS can all improve efficiency and enable closer control of systems. During operations, performance monitoring provides data for analysis and routine maintenance ensures

that systems work to defined criteria. Mr Albitawi presented a case study showing how his recommended principles were applied to process improvements. Critical factors in achieving energy savings and greater reliability include understanding systems, capturing data for monitoring purposes, working with suppliers, preventing or closing leaks through maintenance and applying new developments, particularly in control systems. ●

During operations, performance monitoring provides data for analysis and routine maintenance ensures that systems work to defined criteria.



**Abdullatif N Albitawi CEng
MEI SFIIRSM,
COO, EAGLE
Industries,
DWC-LLC**

ENERGY EFFICIENCY: PROCESSES AIMED AT ENERGY EFFICIENCY

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Questions addressed how EPCs can obtain energy profile data at FEED stage, and responsibilities for generating and providing the data; whether companies have specifications for energy audits and energy savings aspects of designs; how resource efficiency can be encouraged by highlighting the potential cost savings of conservation and the use of alternative sources. The responses included the need for collaboration between employers and EPCs and the challenges of developing a trust-based relationship in the traditional procurement environment, the benefits of adopting standards for energy management systems, so as to facilitate audits and the need for strategic communications in promoting the adoption of renewables -- techniques used in large scale change management.



Choosing options for energy conservation and efficiency; storage; the growing need to address rising populations and urban concentration

Embedding energy efficiency through life cycle assessment

This roundtable covered the use of Life Cycle Assessment (LCA) and Total Cost of Ownership (TCO) methods at design phases to find options that have the best efficiency profiles; comments concerned whether TCO should include opportunity costs of not upgrading key technology and how TCO/LCA tools can be integrated into existing systems and included in tenders. **Saravanan Dhalavoi Pandian, Senior Sustainability Specialist, ENOC**

The role of energy storage in planning our energy needs in the UAE

Batteries are well understood as an energy storage solution but they are currently expensive. The discussion concerned the potential for the use of batteries as part of the grid, and what the cost of storage will need to be in order to displace gas in power production to make batteries feasible. **Bruce Smith, Forecasting and Planning Director, Abu Dhabi Water and Electricity Company**



Abdullatif N Albitawi CEng MEI SFIIRSM, COO, EAGLE Industries, DWC-LLC

and Electricity Company (ADWEC)

Challenges facing renewable energy in the Middle East

The Middle East has seen considerable investment in renewables and there is a pipeline of solar and wind projects in the region. Discussions concerned the challenges facing growth in clean energy for the Middle East, including government policy, costs, adoption and a gradual transition away from

fossil fuels. **Abdullatif N Albitawi CEng MEI SFIIRSM, COO, EAGLE Industries DWC-LLC**

Socio-techno-economic design of energy systems driven by community needs

While traditional energy system designs tend to view energy supply and demand as system start and end points, there is a need for alternative designs that specify and incorporate conversion, transmission and storage technology to meet the service needs of an existing and growing global middle class, whilst catering for more vulnerable communities. Community needs include the location, configuration and distribution of power plants and power grids; taking community considerations into account enables firms to make more sustainable design choices.

Dr Tadhg O'Donovan



Bruce Smith, Forecasting and Planning Director, Abu Dhabi Water and Electricity Company (ADWEC)



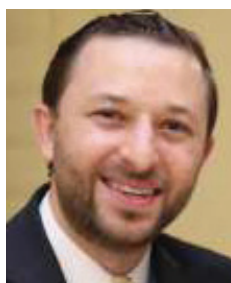
Dr Tadhg O'Donovan, Associate Head of School, Engineering & Physical Sciences, Herriot-Watt University

ROUNDTABLE DISCUSSIONS

Meeting the challenges of providing renewable energy: technical and economic solutions



Dr Raed Bkayrat, CEO, Clean Energy Business Council and Ridah Sabouni, Managing Director MENA, Energetics



Ridah Sabouni,
Managing
Director MENA,
Energetics

Overview of the ESCO market in the GCC countries

This roundtable focused on the status of the efficiency and ESCO market in the GCC. Developments in each country were reviewed, and comments addressed local challenges, innovations already adopted and private sector opportunities. The role of the Clean Energy Business Council's Energy Efficiency Working Group was discussed. **Dr Raed Bkayrat, CEO, Clean Energy Business Council and Ridah Sabouni, Managing Director MENA, Energetics**

Capacity building – taking responsibility for a sustainable future

Capacity building is critical to strengthening institutions and individuals to improve energy management and achieve greater efficiency. Comments from the participants included where capability building is most required,

current initiatives and where efforts can best be focused.

Humaid Abdulla Kanji, Environmental Economist, Environmental Agency Abu Dhabi

Closing remarks by Dr Tadhg O'Donovan

The roundtable discussions surfaced concerns, observations and achievements. A sustainable economy depends on a blend of strategies targeting social, technical and economic aspects of the energy mix, the application of sound business principles and government policy and regulation to ensure compliance. Private sector firms play a role as power providers and contractors, and cooperation around agreed goals can bring about long-term savings. While storage solutions and other technologies are important, they are only part of the picture. Equally significant are investment, adoption and

the establishment of legal / political contexts favourable to the green economy. ●



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