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# GAS EXPLOSION ASSESSMENT AND DRILLING HAZARDS ON OFFSHORE AND ONSHORE FACILITIES

## 4 & 5 APRIL 2012

The course addresses major hazards on offshore and onshore drilling facilities, with a special focus on gas explosion hazards and how they are modelled. It will provide a technical overview of the key tools used to assess explosions and an operational and technical overview of the key tools used to assess Major Accident Hazards in relation to drilling, completion and well intervention operations covering the IADC HSE Case guidelines. The course will also include causes, mechanisms and calculation methods of explosions as well as mitigation methods for explosions, good design practice and future directions in addressing these hazards. The course is a must for safety and risk engineers, drilling engineers, safety consultants as well as regulators.

**VENUE:**

**VICEROY HOTELS AND RESORTS, ABU DHABI**

Organized by GexCon and WorleyParsons

# Course Program 4 APRIL 2012

| Session | Title/Theme | Contents | Time |
|---|---|---|---|
| 1.1 | Coffee and Assembly | • Registrations, coffee and course work pack issuance | 8:30 am |
| 1.2 | Introduction | • Introductions<br>• Overview from Course content<br>• Participant expectations | 9:00 am |
| 1.3 | IADC HSE Guidelines | An introduction and overview of the current IADC offshore and onshore HSE guidance, including:<br>• Drilling Contractor's Management System<br>• Risk Management<br>• Emergency Response<br>• Performance Monitoring | 9:20 am |
| | | **Morning Tea Break 10:30 - 10:45 am** | |
| 1.4 | Case Study | • Buncefield case study<br>• What happened on the Buncefield | 10:45 am |
| 1.5 | Drilling Specific MAHs and Risk Register Development | • Drilling Specific Major Accident Hazards<br>This session will review a typical range of drilling specific major accident hazards with a focus on fire and explosion hazards including blowouts, well test hazards, propulsion room fires and mud pit/mud returns. | 12:00 pm |
| | | **Lunch Break 1:15 - 2:15 pm** | |
| 1.6 | Explosion Fundamentals | Course participants will be provided an overview of fire combustion and explosion propagation in relation to the design of offshore and onshore facilities, including:<br>• Combustion mechanisms<br>• Fuel reactivity<br>• Positive feedback mechanism<br>• Effect of geometrical aspects<br>• Explosion tests | 2:15 pm |
| | | **Afternoon Tea Break 3:45 - 4:00 pm** | |
| 1.7 | BTs and Associated Software | • Bowties<br>• Bowtie software<br>Bow-ties are an IADC recognised Major Accident Hazard management tool and their application, development and maintenance will be presented within this module. | 4:00 pm |
| 1.8 | Day 1 Course Conclusion | • Questions and Answers<br>• Close | 4:45 pm |
| | | **Evening Dinner at 7.30 pm** | |

# Course Program 5 APRIL 2012

| Session | Title/Theme | Contents | Time |
|---|---|---|---|
| 2.1 | Coffee and Assembly | • Day 2 registrations and coffee | 8:30 am |
| 2.2 | Bowtie Practical Sessio | • Bow-tie operational integrity review<br>The participants will undertake a practical desktop case study to review the Integrity of a MODU utilising a bow-tie as an integrity screening tool. | 9:00 am |
| | | **Morning Tea Break 10:30 - 10:45 am** | |
| 2.3 | SCE | • Safety Critical Elements (SCEs)<br>A typical range of SCEs will be discussed and the methodologies for the development of their associated performance with respect to the prevention and control of Major Accident Hazards | 10:45 am |
| 2.4 | Explosion Modelling | The participant will be provided an introduction to the practicalities of explosion modelling in the context of both open and compartmentalised offshore facilities, including:<br>• Explosion modelling<br>• Why simple models do not work<br>• Computational Fluid Dynamics and associated modelling toolkits | 11:30 am |
| 2.5 | Explosion Modelling Practical MEM Analytical | Implementation of specific examples for the solution of Gas explosion scenarios using analytical methods | 12:45 pm |
| | | **Lunch Break 1:15 - 2:15 pm** | |
| 2.6 | Explosion Modelling Practical | Using FLACS to solve for a selected dispersion and explosion scenarios. | 2:15 pm |
| | | **Afternoon Tea Break 3:30 - 3:45 pm** | |
| 2.7 | Fire and Blast Mitigation and Control | The module will be to provide an overview of the range of measures that are available to mitigate the effects of Fire and Blast. Guidance will be provided on the assessment of design and IADC compliant HSE Case content with respect to facility:<br>• Layout<br>• Use of explosion venting devices<br>• Fire and gas systems<br>• Effect of water spray<br>• Escalation: Loading on equipment and piping<br>• Passive fire protection<br>• Blast walls<br>• Intrinsically safe electrical equipment | 3:45 pm |
| 2.8 | Structural Analysis | • Standards and their Requirements<br>• Process Overview<br>• Static Analysis<br>• Single Degree of Freedom Analysis<br>• Advanced Dynamic FEA | 4:30 pm |
| 2.9 | Q&A Session and Course Conclusion | • Questions and Answers<br>• Close | 5:00 pm |

## PRACTICAL INFORMATION

# Registration before 10 Mar 2012

**Pre-registration is required.**

Please send an e-mail to *australia@gexcon.com* in order to receive a registration form.
Your registration must be submitted before **10 Mar 2012**
Attendance fee 1,500 USD (includes 2 lunches and 1 dinner).

## Hotel booking

A block of rooms is available at Viceroy. In order to receive the special course rate you have to use the Reservation Form for the hotel, which will be sent to you with the registration form.

## Viceroy Hotels and Resorts, Abu Dhabi

The course will be held at Viceroy Hotels and Resorts, Abu Dhabi.

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## The lecturers

The lecturers include explosion experts **Dr Prankul Middha** and **Dr Madhat Abdel-jawad** from Gexcon and **Mr Mark Cowan** from WorleyParsons Consultancy Practices.

Their main activities beside training courses include explosion modelling, explosion analyses, accident investigations, safety studies and risk management.

Lecturers may be altered within GexCons and WorleyParsons range of explosion and safety experts.

Gexcon

GexCon is an R&D and consulting company specializing in industrial explosion risk. 30 years of dedicated experimental research in the field of explosion safety has been carried out in parallel to the development of the commercial CFD-software FLACS for explosion and dispersion calculations. GexCon offers highly qualified services and explosion consequence software worldwide.

**www.gexcon.com**

WorleyParsons
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WorleyParsons is a leading global provider of professional services to the resources and energy sectors. A large and diverse engineering group comprising over 30,000 personnel worldwide, with a reputation for industry leadership in several fields including safety and risk engineering.

**www.worleyparsons.com**