

Preliminary Program

June 15 - 17, 2010

Oslo, Norway





Conference Site

Grand Hotel
Karl Johans gate 31
0159 Oslo, NORWAY

Phone: +47 23 21 2000
www.grand.no

Executive and Technical Program Committee

Patrick Leroux, TOTAL (F), Chair
Jean-Charles Guilhem, ABB (F), Vice Chair
Terence Hazel, Schneider Electric (F), Secretary
Heinz Berger, Certiconsult (CH), Treasurer
Ben Johnson, IEEE-PCIC (USA)
Jacques Tastet, Technip (F)
Geir Nordvik, Statoil (N)
Gérard Hombourger, ExxonMobil (F)
Graeme Peck, Hess (GB)
Peter Freeman, Shell (NL)

Organisation Committee

Terence Hazel, Schneider Electric (F)
Jean-Charles Guilhem, ABB (F)

Local Committee

Thore Andersen, NEK (N)
Helge Topp, NEK (N)
Ingulf Egeland, Technor (N)
Hilde Omsted, ABB (N)
Hazel Zimeri, ABB (N)
Nathalie Bruno-Chavanne, ABB (F)

Contacts

Patrick Leroux, TOTAL (F)
Terence Hazel, Schneider Electric, (F)
Nathalie Bruno-Chavanne, ABB (F)

patrick.leroux@pcic-europe.eu
terence.hazel@pcic-europe.eu
nathalie.bruno-chavanne@pcic-europe.eu

7th PCIC-Europe Conference, June 15-17th 2010 in Oslo Norway

The Petroleum and Chemical Industry Committee Europe is organizing its 7th annual conference in Oslo, Norway from June 15th to 17th 2010.



Oslo is the biggest city in Norway, and has been the country's capital since 1814. The Government and Parliament are located here and the Royal Palace can be found at one end of Oslo's main street, Karl Johans gate.

Oslo's beautiful location at the head of Oslo Fjord surrounded by forested ridges gives the city an atmosphere which is not expected in a capital city.



Oslo has a rich and varied cultural life. Would you like to visit some of the many attractions? Or maybe do some people watching from a sidewalk café? Oslo caters for every taste!

The history of Oslo goes back to around year 1000 AD. Since the Middle Ages Oslo has gone through great changes, even the name of the city has been changed a few times, before it became the city it is today.



The Viking Age, approximately 800-1050 AD, refers to the period when the Scandinavians explored Europe through trade and warfare. With their fast and seaworthy ships the Vikings travelled as far as America.

Norway has been producing great explorers ever since the Viking Age. Several of their daring adventures have contributed to changing the course of history. The first great explorations and expeditions took place in the Viking Age and have continued up to our day.

The city is a great destination for those who enjoy outdoor activities.

Even in the city centre, the nearest park is never more than a few blocks away. A ten-minute boat ride from the centre takes you to lovely beaches on the Oslo Fjord islands. In the winter Oslo has hundreds of kilometers of cross-country trails within the city boundaries, in addition to eight ski centres.

You will find a city filled with plenty of surprises and excitement. We hope you will discover many of them!

Welcome to Oslo !

The 2010 technical program



The continued success of the PCIC Europe conference demonstrates that it truly does provide the international forum needed by those involved in the Oil & Gas Exploration, Production, Refining, Petrochemical, Chemical and Pharmaceutical Industries. The presentation of high quality technical papers and the discussions during and after the conference make it very interesting for all attendees. The 2008 PCIC Europe introduced a tutorial session which was very well attended, and we will have similar sessions at the 2010 conference. The PCIC Europe conference is a rare opportunity for end-users, engineering companies, manufacturers and regulatory bodies to be able to meet and discuss matters of vital importance to the industry.

The PCIC Europe Committee has renewed the technical co-sponsorship with the Industrial Applications Society of IEEE. In addition to the possibility offered to authors to have selected papers published in the Industrial Applications Transactions and Magazine, all papers presented in the 2010 PCIC Europe conference will be digitally archived on IEEE Xplore thus being available to readers throughout the world via the IEEE Xplore website. Papers from the 2009 Barcelona PCIC Europe conference are available through IEEE Xplore.

The main topics of the PCIC Europe conference are:

1. Energy efficiency & sustainable development
2. Safety in the Workplace
3. Experiences from Users with Regulations and Standards
4. Electrical and Instrumentation (E&I) Engineering Practices
5. Equipment, Systems and Components
6. Operation, Maintenance, Repair, Asset Management and Qualification of Personnel

Attending the PCIC Europe conference is one of the best ways of getting the information needed to be able to adapt quickly in our ever-changing industry. Presenting a paper at a PCIC Europe conference is a way to control the evolution of our industry.

I am looking forward to seeing you in Oslo.
Terence Hazel



PCIC Europe Mission

To provide an international forum for the exchange of electrical applications technology relating to the petroleum and chemical industry, to sponsor appropriate standards activity for that industry, and to provide opportunity for professional development.

PCIC Europe Strategies

1. The PCIC Europe Annual Technical Conference will be held in locations of industry strength, and its location will be rotated annually in an effort to attract national and international participation.
2. PCIC Europe will proactively promote participation by a broad base of PCIC Europe representatives, with an emphasis on both younger and retired engineers.
3. Attendees will be encouraged to participate in technical activities including authorship of papers and standards development.
4. The quality of PCIC Europe paper offerings is essential for the PCIC Europe mission to succeed and will be given highest priority. **Preference will be given to application-oriented papers.**
5. The technical content of the PCIC Europe Annual Conference will be continuously evaluated and updated to reflect the evolving needs of the industry.
6. Participation of users, manufacturers, consultants and contractors will be encouraged in the activities of PCIC Europe to strengthen the conference technical base.
7. PCIC Europe will offer tutorials directed towards enhancing the technical, communication, and interpersonal skills of petroleum and chemical industry engineers.

Schedule at a glance

Tuesday, 15. June 2010

13:30 - 15:30	Subsea Tutorial
15:30 - 16:00	Coffee Break
16:00 - 18:00	IEC 61850 Tutorial
19:00	Welcome Reception and Cocktail

Hospitality Area hours

14:00 - 19:00

20:30 - 24:00

Wednesday, 16. June 2010

08:30 - 10:00	Paper presentations
10:00 - 10:30	Coffee Break
10:30 - 12:00	Paper presentations
12:00 - 13:30	Lunch
13:30 - 15:00	Paper presentations
15:00 - 15:30	Coffee Break
15:30 - 17:00	Paper presentations

12:00 - 13:30

17:00 - 24:00

Thursday, 17. June 2010

08:30 - 10:00	Paper presentations
10:00 - 10:30	Coffee Break
10:30 - 12:00	Paper presentations
12:00 - 13:30	Lunch
13:30 - 15:00	Paper presentations
15:00 - 15:30	Coffee Break
15:30 - 17:00	Paper presentations

12:00 - 13:30

28 of the following papers will be presented at the 2010 PCIC Europe Conference

Ref.	Title	Lead Author
OS-01	<p>Selecting Reliable Cost Effective Power Systems for Oil & Gas Facilities</p> <p>This paper illustrates the importance of power system configurations and the applied technology on reliability and the Life Cycle Cost of industrial power systems. The importance of customers' subjective preferences is discussed.</p>	Krassimir Kutlev
OS-03	<p>Use of Fluid Filled Motor for Subsea Pump Applications</p> <p>Deep offshore Oil&Gas developments involve fluid transport over long distances. To meet the technical challenges of these developments, subsea fluid filled motors have been developed and used. This paper gives an overview of existing motor technology used on oil fields, the technical challenges, present limitations, the system approach and it also introduces for future development the possibility to use a permanent magnet motor.</p>	Edouard Thibaut
OS-04	<p>Cable Trays in Oil & Gas: Is Quality & Competition of Materials Compatible?</p> <p>Theoretically the choice of fiberglass reinforced polyester for cable trays is the ideal material for an offshore application, but aluminum is cheaper at present, and stainless steel is part of the common habits. In reality each materials has its strengths and weaknesses and this may be helpful for operators and actors to have a broad overview of those for each materials.</p>	Pascal Muller
OS-05	<p>What to do if you are afraid of the dark?</p> <p>Many control functions relate to safety and they must run all the time, even in case of loss of the main electrical power. Backup power system based on UPS or gensets are the most common way to ensure this continuity of operation and blackstart operation. This paper presents recommendations for the design of electrical backup systems based on characteristics of the different technologies that can be used and different architectures.</p>	Philippe Angays
OS-06	<p>Experience in Design, Engineering, Testing & Implementation of electrical systems for a large Gas Processing Plant</p> <p>This paper covers design criteria for electrical systems, constraints in engineering of electrical systems for large plants, development of protection, control & power management system philosophy for different voltage levels. The paper provides the reader with the identification of the critical areas of concern in designing electrical systems for large gas processing plants and highlights the lessons learnt by the authors during implementation of projects.</p>	Prabhat Saxena

Ref.	Title	Lead Author
OS-07	<p>Subsea Compression Substation Pilot</p> <p>This paper describes the electrical system design, equipment and technology used for a 12,5 MW station pilot at 900 meters water depth. The electrical equipment includes subsea 36kV switchgear and transformers, UPS and subsea frequency converters to drive the subsea compressor and pump. The electrical equipment is installed in subsea enclosures. The compressor is driven directly by a high speed electrical motor. The electrical power is supplied from shore through a 125 km long power umbilical.</p>	Henri Baerd
OS-08	<p>A solution to measure the flow rate of wet gas</p> <p>This paper describes a solution using a wet gas flow meter (WGFM), which will help the operators determine the amount of liquid flow rate that is present in the multiphase stream. Gas Volume Fraction (GVF) and Liquid Volume Fraction (LVF) will vary over the lifetime of the well and will require regular testing of these ratios in order to determine corrections to the measurement errors that are exhibited in traditional flow metering technologies. This paper explains the problems that the oil and gas operators face and how its WGFM solution will help them with these challenges.</p>	John Wilson
OS-09	<p>Optimal Use of Gas and Steam Turbines</p> <p>Large facilities are often powered by gas turbines. Several constraints must be taken into account such as maintaining sufficient spinning reserve, operation at low NOx emission levels, & poor dynamic response of some turbines. Some of these criteria can be contradictory. The paper will explore the different aspects that must be taken into account in the optimal selection of which turbines to use under different operating conditions. It also describes the minimum requirements of the Power Management System that is necessary to implement this optimization.</p>	Terence Hazel
OS-10	<p>Medium Voltage Electric Motors Installed in Arctic Environment</p> <p>Designing medium voltage induction motors for use in Arctic environments involves a number of challenges. Ambient temperatures which average below -40°C in winter can affect all motor components. Other environmental factors that must be taken into account include harsh wind, ice and snow conditions. Even greater precaution is required when designing motors for hazardous areas in order to provide maximum safety. This paper describes design criteria that can be adopted to ensure that motors will operate safely and reliably in Arctic environments.</p>	Andrea Casiraghi

Ref.	Title	Lead Author
OS-11	<p>Energy Storage using Compressed Air</p> <p>In a world with increasing unpredictable electricity production from renewable sources combined with base load generation with limited possibilities for part load production, electric utilities will confront a challenge in matching the electricity supply with the demand. Thus, for several years engineers have been looking for ways to store electricity. Compressed air energy storage (CAES) could be a solution to the problem. The CAES concept is not new. Two plants are currently in operation one in Huntorf, Germany and one in McIntosh, Alabama, but the market conditions in the later years have so far not favoured CAES – but now is the time.</p>	Arne Hanes
OS-12	<p>The Use of Competent Persons for Work in Hazardous Areas</p> <p>If the special equipment required for use in hazardous areas is NOT installed correctly it may no longer provide the explosion protection integrity causing unsafe conditions. The use of competent persons ensures that equipment will be used correctly and the explosion protection integrity for the life of the equipment will be maintained. The Personnel Competencies Scheme is another element of certification to support the Equipment and Service facilities Schemes. This IECEx Certification of Personnel Competencies opens the way for a global scheme to provide consistency in the assessment of competent persons.</p>	Ralph Wigg
OS-13	<p>Large Adjustable Speed Drives – Efficiency, Energy Savings and Availability</p> <p>Overall efficiency is evaluated for different adjustable MW speed drive topologies, motor types, control methods and system configurations. It is shown how modern technology can be applied safely with existing/standard petrochemical motors. Adjustable speed drives can contribute to remarkable energy savings shown in a case study but system availability can be compromised resulting in production losses which can be significantly more than the energy savings. The importance of a holistic evaluation of efficiency, energy savings and system availability is illustrated.</p>	Frieder Endrejat
OS-15	<p>Analysis of Ignition Risk on Ball Bearings in Rotating Equipment in Explosive Atmospheres</p> <p>Since the ATEX directive implementation in 2003, mechanical ignition sources including ball bearings must be assessed. This was not the case with the former directive. Little knowledge and experience exist in this area. The aim of this paper is to study the effects of ball bearings in electrical and mechanical equipment as a source of ignition of explosive atmospheres. Knowledge gained on the identification of initial occurrences of ignition sources in ball bearings is implemented in explosion protection in industrial plants. Based on data acquired during monitoring of temperatures and vibration data in damaged ball bearings, analysis was performed according to set control limits of ignition of gases, vapour and dust, as a measure before the development of an ignition source.</p>	Slavko Rumbak

Ref.	Title	Lead Author
OS-16	<p>Minimizing Hazard to Personnel, Damage to Equipment, and Process Outages by Optical Arc-Flash Protection</p> <p>Arc-flash can be characterized as an electrical explosion leading to injuries to personnel, significant damage to equipment and long process outage. Significant improvement of safety cost saving can be achieved by fast detection and rapid elimination of arc faults. The most practical way to reduce the energy is to limit the arcing time by using high-speed protection. The arcing time consist of two components: the relay trip time and the circuit breaker operation time. The total arcing time depends thus mostly on the CB time. For maximal protection, arc quenching devices connected to the fault sensing system can be applied.</p>	Lauri Kumpulainen
OS-17	<p>Distributed Generation Control in Islanded Industrial Facilities: A Case Study in Power Management Systems</p> <p>Relatively low system inertia and the power system configuration of inter-tie connections between distributed generation facilities, necessitate the implementation of power management control algorithms that provide both proactive and reactive stabilization techniques, to ensure the optimum system operation. This paper explores the technical aspects of a recently commissioned power management system that incorporates smart, real-time generation, voltage, and islanding control.</p>	Nicholas Seeley
OS-18	<p>Behaviour of Insulation Systems in Gas Groups IIA IIB IIC</p> <p>Safe operation of large motors and generators in an explosive gas environment is one of the prime concerns. Partial discharge (PD) and/or endwinding corona discharge activities are the phenomena related to operating voltage. PD or corona discharge activity exceeding certain limits may ignite gas. In order to assess the behavior of insulations systems rated form 6.6 kV to 13.8 kV steady state ignition test (Incendivity testing) are performed in gas groups IIA, IIB, and IIC as specified in IEC Standard 60079-15. The contributing factors and mitigation of discharge activity will be discussed in detail in the paper.</p>	Saeed Haq
OS-19	<p>Power cables and umbilicals for the offshore industry – state of the art and further development</p> <p>The first dynamic high voltage cable was developed for the North East Frigg field in the 80ies, the world's first dynamic steel tube umbilical was installed at the Mars field in 1996 and the world's longest XLPE submarine cable link between land and the Troll A platform was installed in 1996. Since then the trend has been towards longer lengths, higher voltages and deeper waters. The paper will describe the main development done on power cables and umbilicals to offshore installations. Recent projects and development of combined solutions, i.e. power cables combined with signal cables, steel tubes, fiber optic elements, etc (Power Umbilicals) will be presented.</p>	Gunnar Evenset

Ref.	Title	Lead Author
OS-21	<p>Process Safety, Instrumented Safety Barriers – What Can We Learn From the Nuclear Industry?</p> <p>Standards like IEC 61508 have been pushing the formalization and documentation of the reliability of instrumented safety systems. It is of interest to investigate what we can learn from other industries with high safety requirements. The nuclear industry has been extremely focused on establishing barriers to prevent incidents to develop into accidents. Many of these barrier systems are based on instrumented systems. The paper will give an outline of how principles used in a nuclear power plant are may be applied in the oil and gas industry.</p>	<p>Michael Knochenhauer</p>
OS-22	<p>Lighting in Extreme Temperature Environments: The Highs and the Lows</p> <p>This paper discusses the effects of ambient temperature on lamps and lighting fixtures, both designed for an ambient temperature of 25°C. In extremely cold temperatures, lamp starting capability and fixture efficacy can be negatively impacted and the choice of lighting systems decreases with the temperature. In high ambient conditions, both lamp and ballast life can be significantly reduced along with changes lumen performance. The lighting systems discussed include Metal Halide, High pressure Sodium, Fluorescent, Incandescent and LED. Each has its place in extreme temperatures.</p>	<p>Marty Cole</p>
OS-24	<p>Comparison CSA-OBIEC with ATEX Directives</p> <p>The Objective-Based Industrial Electrical Code (OBIEC) was introduced in January 2009. Users are allowed to build facilities based on safety objectives versus prescriptive electrical codes such as the CEC and NEC. This paper will discuss what the OBIEC means to industry and provide an update on acceptance. On the European side the ATEX Directives were introduced in July 2003 also based on Safety objective principles. Moving out from descriptive standards, OBIEC and ATEX share many similarities and keep some differences that this paper is to highlight and will conclude on what enhancements each system can offer to the other.</p>	<p>Jean-Charles Guilhem</p>
OS-25	<p>Industrialization of Active Magnetic Bearing Systems with Standard Drive Technology</p> <p>Active Magnetic Bearings (AMBs) have been used in the O&G-Industry for more than 20 years and the advantages are oil free, clean, small footprint due to the possibility of direct drive systems, low vibration and a wide operational speed range. Despite this the number of new projects with AMB technology remains small. The variable speed drive system (VSDD), has made its way into proven O&G technology in the last decades. An AMB system with its controller is actually very similar to VSD systems. The paper will show how Standard VSDD technologie can be successfully adapted to control AMBs allowing cutomers to use their in-house expertise.</p>	<p>Hartmut Walter</p>

Ref.	Title	Lead Author
OS-26	<p>Lighting, Light Sources, Economics and Safety</p> <p>What light source gives you the quality of light required for safe operation and reliability in today's facilities? This paper will compare new and traditional lighting sources and designs used today in hazardous locations, exploring limitations due to many factors. Lighting approaches around the world differ. With the introduction of new lighting technology such as L.E.D's and more there has been increased recognition of options available for lighting systems. Decisions on what type of lighting system to use are too often based on up front capital cost, and not always looked at long term maintainability, efficiency of light and safety in the work environment.</p>	Ken Martin
OS-28	<p>Future Power Supply of the Total Offshore Valhall Oil and Gas Field</p> <p>The Valhall Field has been in operation since 1982 and has an remaining life time of 40 years. Power is produced by gas turbines. Due to reservoir compaction some old platforms will be replaced. It was decided to have only electrical motor drives of all process pumps and compressors on the new platforms. It was decided to supply the new & existing platforms from shore. The distance to shore is 292km and a HVDC transmission system is the only solution. The paper will cover information about the Valhall field and the ongoing Valhall Redevelopment project with main focus on Power from Shore transmission system.</p>	Bo Westman
OS-30	<p>Hazardous Location Lighting: New Lighting Technology from IEC vs NEC Perspective</p> <p>This paper presents construction, protection methods and testing techniques used in hazardous location lighting. The common goal is "The safety of lighting products used in hazardous locations". While the premise behind this paper is the continuing blend of IEC and NEC into global standards, there is a large body of end users, design engineers and manufacturers who are hesitant to change. This paper will discuss new lighting technology, hazardous location construction techniques and method of protection utilized by IEC and NEC giving engineers and maintenance personnel the ability to decide what is best for their facility and if safety should be a concern.</p>	Jean-Pierre Sylvain
OS-31	<p>External influences: Impact on the Equipment Choice and How They are Covered by Available Ex Standards</p> <p>Electrical equipment shall be selected and installed so that it is protected against external influences which could adversely affect the explosion protection. Petrochemicals plants are often submitted to several hard conditions in a same time. Through a complete review of these conditions, the authors will highlight that in addition to the criteria regarding nature of material, Ex standards including installation and maintenance guide are a complete or partial answer which can guarantee the suitability of Ex equipment with these specific conditions.</p>	Xavier Lefebvre

Ref.	Title	Lead Author
OS-32	<p>What a Service Facility has to do to Comply with the Requirements of the IECEx Certified Service Facility Scheme</p> <p>Information will be presented to show what evidence a service facility needs to produce to be certified as Competent within the IECEx Certified Service Facility Scheme. This includes competency of Responsible Person, how RP has responsibility and authority to control to overhaul & repair process, competency of Ex Operatives, procedures for the control of the reclamation of Ex Components, competency of reclamation operatives, & quality system requirements specific to Ex Equipment repair. Information will be presented on advantages for Ex Equipment Users to use IECEx Certified Service Facilities.</p>	John Allen
OS-35	<p>Electrical LNG: Main Issues During the Multi-MW Compressor Call for Tender Clarifications</p> <p>The first electrical drive for the huge LNG compressors started in Norway and some new LNG projects are considering electrical drives. This paper deals with electrical drive technical selection during the call for tender for LNG plant MW compressor drivers and includes equipment characteristics, and operating & functional requirements. Coordination with the mechanical team includes interfaces between compressor and motor, simulation analysis, & shaft study. Starting conditions, cooling systems, container versus buildings, preliminary harmonic study etc. help provide clear recommendations to the project engineer on the electrical equipment.</p>	Denis Bue
OS-36	<p>MV Soft-Starter Thyristor Protection - Analysis and Solutions</p> <p>Thyristor-based Reduced Voltage Soft-Starters (RVSS) are used for MV motor starting but little is said about protecting the semiconductors. Major transient constraints are overvoltages during switching off and di/dt while turning on. A reactor of 100µH is very efficient, however bulky. Accurate sizing of this reactor is crucial. This paper presents results of modeling proving that the current transients depend on the immediate upstream & downstream environment, and not only on the motor cable length. The authors have developed a simple tool, which identifies if a given application needs protection and the size of the reactor.</p>	Delcho Penkov
OS-38	<p>IECEx Certification Schemes Versus ATEX Directives</p> <p>Two international certification schemes exist for hazardous areas. One is the ATEX Directives (European) the other is the IECEx system, more international but a voluntary certification scheme. This paper targets plant operators, engineering contractors, installers and equipment manufacturers involved with hazardous area equipment. The paper compares both to help answer questions like which certification requirements are applicable to equipment, what is the most convenient way to certify assemblies, what about equipment with certificates of component, what are the benefits of the voluntary IECEx certification scheme.</p>	Rudolf Pommé

Ref.	Title	Lead Author
OS-39	<p>Increase power transformer reliability and availability with on site overhaul and repair</p> <p>New methodology for condition assessment of transformers can identify defects before unloading transformers. But when a transformer has to be repaired the time for transportation to a factory will determine when it can be put back in service. The cost and risk of this have to be considered seriously. With an example this paper will explain how potential defaults may be detected, priorities of repair can be ranked and how the repair of a large power transformer can be executed on site with the same level of quality and tests as if performed in a transformer factory.</p>	Pierre Lorin
OS-40	<p>Partial Discharge and Partial Discharge Testing For ESP Motors</p> <p>Oil recovery in subsea and other high cost intervention wells are becoming more common. These wells require down-hole equipment to have a high level of reliability. This paper reviews issues related to electrical submersible pumping (ESP) motors, and partial discharge (PD) testing. Many ESP customers ask for partial discharge testing as a means to increase equipment reliability. This paper facilitates understanding what partial discharge is and how it affects ESP motors.</p>	Clark Shaver

