

MAIN THEME:

OPEN AND ENCLOSED FIRES

Challenges in layout and design

TRONDHEIM, 4 – 6 NOV 2014

4th EDUCATIONAL COURSE ON OIL AND GAS

FIRE

Frontline knowledge on experience and calculation tools

4 – 6 November 2014, Trondheim, Norway

Time and location

4 – 6 November 2014 at the brand new Hotel Scandic Lerkendal, Trondheim, Norway. Visit the [hotel's web page](#).

Register online: [Click here](#)

or send an email to Sissel.Skjelvik@spfr.no. Deadline for registration is 1 Sept 2014.

Dinner

We have the pleasure of inviting you to a dinner on Wednesday evening, 5 Nov.

Participation fee

(Ex VAT, incl. conference dinner Day 2):

Full three days:NOK 19.250
Days 2 and 3 only:NOK 15.650

Discounts for groups and students: contact Sissel.Skjelvik@spfr.no

Fee for cancellation after 1 Sept.: NOK 4.000
Cancellation after 20 Oct will be charged in full.

Hotel:

Book accommodation within 29 Aug 2014 on Hotel Scandic Lerkendal's [web page](#) or by e-mail to lerkendal@scandichotels.com. Refer to booking code **BSIN041114**.

Prices per person incl. breakfast:
Single/double room NOK 990/1.100

Single/double room,
connection night..... NOK 890/1.190

Contact:

If you have any questions, please contact Sissel Skjelvik, e-mail: Sissel.Skjelvik@spfr.no or phone (+47) 464 41 687.

What can we learn from accidents - revisiting the Piper Alpha accident. The explosion and fire on the offshore production platform Piper Alpha in 1988 is the most severe accident in the history of the North Sea petroleum industry. 167 people died and the material losses were enormous. In the 4th Educational course on oil and gas fires, the story of the Piper Alpha accident will be told and interpreted through presentations of experimental tests, calculations and risk analyses. Emphasis will be placed on the importance of layout and design on off- and onshore installations.

REGISTER ONLINE: [Click here](#)

Choose to participate all three days or only Day 2 and 3, dependent on your skills. Lectures will be given by representatives from SP Fire Research, ComputIT, Lloyd's Register Consulting, and invited speakers. The course includes a demonstration of a large-scale fire test.

Program DAY 1 – Basic theory

Day 1 gives you the basic knowledge to follow Day 2 and 3 of the course. You will be introduced to fire theory and analysis, including combustion theory, smoke production, response to fire, and calculation of heat loads and structural response.

Program DAY 2 and 3 – Advanced

"Open and enclosed fires; challenges in layout and design" is the theme of Day 2 and 3. You will be introduced to advanced approaches to calculate structural response and heat loads from fires. Concepts of quantitative risk analysis, fire modeling with special focus on the CFD tool "Kameleon FireEx KFX®", and fire testing will be discussed.

See the next pages for detailed program.

Speakers

INVITED SPEAKER:

Tore Holmås

Specialist Engineer, Aker Solutions



INVITED SPEAKER:

Torleif Husebø

*Head of Process Integrity Section,
Petroleum Safety Authority Norway*



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SPEAKERS FROM SP FIRE RESEARCH,
COMPUTIT AND LLOYD'S REGISTER
CONSULTING:

Petter Aune

Principal Specialist, ComputIT

Rune N. Kleiveland

Principal Specialist, ComputIT

Nils Inge Lilleheie

Senior Principal Specialist, ComputIT

Bjørn F. Magnussen

Professor Emeritus, ComputIT

Jan Pappas

*Senior Principle Consultant,
Lloyd's Register Consulting*

Anne Steen-Hansen

Research Manager, SP Fire Research

Reidar Stølen

Research Scientist, SP Fire Research

Ragnar Wighus

Chief Scientist, SP Fire Research

Program

4 November: BASIC INTRODUCTION

Tuesday 4 November 2014

Basic part 1: Theory and introduction to fire

09:00 – 09:30	Registration and coffee
09:30 – 09:45	Welcome Presentation of SP Fire Research, ComputIT and Lloyd's Register Consulting. Practical details.
09:45 – 10:15	Combustion theory <i>Petter Aune and Anne Steen-Hansen</i> Burning of gases liquids and solids. Main mechanisms, air/fuel-ratio, ignition, adiabatic flame temperature, flame velocity, laminar/turbulent flames, UEL/LEL. Fire dynamics, heat transfer (conduction, convection, radiation). Basic flame extinction principles. Difference between explosion and fire. Smoke generation and smoke properties.
10:15 – 10:30	Coffee and discussion
10:30 – 11:15	Combustion theory, continued
11:15 – 11:30	Coffee and refreshments
11:30 – 12:15	Combustion theory, continued
12:15 – 12:45	Characteristics of fire <i>Ragnar Wighus</i> Temperatures, liquid fires, gas fires, and fire tests.
12:45 – 13:00	Questions and discussion
13:00 – 14:00	Lunch

BASIC part 2: Fire analysis

14:10 – 14:50	Response to fire <i>Reidar Stølen</i> Heat transfer to materials in fires, absorbed heat, thermal and mechanical response of objects and instruments in fire tests, interpretation of measurements and test results.
14:50 – 15:05	Coffee and discussion
15:05 – 15:45	Fire scenarios in QRA <i>Jan Pappas</i> Leakages and ignition. Pool fires, jet fires, and spray fires.
15:45 – 16:00	Coffee and refreshments
16:00 – 16:45	Rules of thumb <i>Jan Pappas</i> Calculation methods based on empirical correlations.
16:45 – 17:00	Questions and closing remarks

Program

5 – 6 November: ADVANCED

Wednesday 5 November 2014

Advanced part 1: Open and enclosed fires. Challenges in layout and design	
09:00 – 09:30	Registration and coffee
09:30 – 10:30	Piper Alpha; a lesson on escalation. The Accident <i>Jan Pappas</i>
10:30 – 10:45	Coffee and discussion
10:45 – 11:30	Piper Alpha; a lesson on escalation. Fire aspects <i>Bjørn F. Magnussen</i>
11:30 – 11:45	Coffee and refreshments
11:45 – 12:45	Blast and fire engineering for topside structures <i>Ragnar Wighus</i> Research Program initiated after the Piper Alpha accident. Large scale fire experiments.
12:45 – 13:00	Discussion
13:00 – 14:00	Lunch
14:00 – 14:45	Introduction to fire modeling (CFD) <i>Rune N. Kleiveland</i> Possibilities and limitations. Examples.
14:45 – 15:00	Coffee and discussion
15:00 – 15:45	Simulation of large scale fire tests <i>ComputIT</i> Validation of calculation models.
15:45 – 16:00	Coffee and refreshments
Advanced part 2: Fire demo	
16:00 – 16:20	Information about the fire demo test <i>Reidar Stølen</i>
16:20 – 17:00	Transport to Tiller
17:00 – 17:45	Large-scale fire test of PFP at SP Fire Research
18:00	Transport from Tiller to Hotel Scandic Lerkendal
19:30	Dinner

Thursday 6 November 2014

Advanced part 2 cont.: Fire demo results/analysis	
09:00 – 09:15	Coffee
09:15 – 10:15	Experimental results from the fire test compared with simulations <i>Reidar Stølen and Petter Aune</i>
10:15 – 10:30	Coffee and refreshments
Advanced part 1 cont.: Open and enclosed fires. Challenges in layout and design	
10:30 – 11:30	INVITED SPEAKER: <i>Torleif Husebø,</i> <i>Petroleum Safety Authority Norway</i> Risk assessments and uncertainty management
11:30 – 12:30	Lunch
12:40 – 13:15	Enclosed fires – effect of deluge <i>Ragnar Wighus</i>
13:15 – 13:30	Coffee and discussion
13:30 – 14:15	INVITED SPEAKER: <i>Tore Holmås, Aker Solutions</i> Analysis competitions or background for decisions?
14:15 – 14:30	Coffee and refreshments
14:30 – 15:15	Closing remarks Summary and challenges. Discussion and panel debate.

Organizers

SP Fire Research AS – Norwegian Fire Research Laboratory offers fire technical expert services for a safer society. We aim towards all industries and parts of the society where fire constitutes a risk, with a special focus on the offshore and maritime industry. We are appointed Notified Body for several product areas, both for construction products and maritime equipment, and offer the necessary services and documentation to give products access to an international market.

www.spfr.no

ComputIT – Computational Industry Technologies AS is a specialist company working worldwide with focus on CFD-based turbulent flow and combustion, and in particular fire and explosion safety, using our software Kameleon FireEx KFX® for both analyses and as basis for design. We offer consultant services in the areas of fire and explosion safety, environment, and process design for a multitude of oil and gas platforms, FPSO's and onshore process plants.

www.computit.no

Lloyd's Register Consulting has the breadth and depth of skills necessary to carry out qualified technical consulting services in a wide variety of industries. Among them are Quantitative risk analysis (QRA) for the oil and gas industry, where incidents related to fire are one of the main hazards that are analyzed. QRA is a key element tool applied in safety management and risk control throughout design, construction, operation and decommissioning of all industrial activity in order to achieve safe operation and major hazard control. QRA typically assesses an entire plant, platform, field, transportation system or a specific system or a particular operation. Lloyd's Register Consulting has a strong track record in carrying out QRA studies in compliance with several international standards.

www.lr.org/en/consulting/