



5 - 8 June 2016 · Konzerthaus Freiburg · Germany

PROGRAMME



loss prevention 2016

**15th International Symposium
on Loss Prevention and
Safety Promotion
in the Process Industries**
and accompanying exhibition

www.lp2016.eu

We create
chemistry
that helps
lush landscapes
love thriving
cities.



The construction industry currently accounts for about half of the world's consumption of energy and resources. It's a substantial amount - but it can be reduced, if you just add the right chemistry.

We've developed a number of solutions that make construction more mindful of the environment and buildings that are more durable and efficient throughout their life cycle. The result is that new developments are less taxing on our finite resources in the short and long term.

When we can build more while using less, it's because at BASF, we create chemistry.

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 **BASF**
We create chemistry

Sunday, 5 June 2016

Room: Foyer Rolf Böhme Saal

16:00
–
19:00

REGISTRATION AND WELCOME RECEPTION

Monday, 6 June 2016

Plenary Room: Rolf Böhme Saal

8:00 **REGISTRATION**

8:45 **Opening Ceremony**

9:15 **PLENARY TALK**
The dilemma of Innovation: Changes – Safely!?!
Companies in the tension between a failure culture and security claim
E. Foltin¹; ¹ FFC/D

Plenary Room: Rolf Böhme Saal

SIMULATION AND MODELING

10:00 **Coherent Computational Analysis of Large-Scale Explosions and Fires in Complex Geometries – From Combustion Science to a Safer Oil and Gas Industry**
K. Rian¹; T. Evanger¹; B. Vembe¹; N. Lilleheie¹; B. Lakså¹; B. Hjertager²; B. Magnussen³; ¹ Computational Industry Technologies AS/N; ² University of Stavanger/N; ³ Norwegian University of Science and Technology (NTNU)/Computational Industry Technologies AS/N

10:30 **A dynamic heat transfer model to predict the thermal response of a tank exposed to a pool fire**
T. Lackman¹; M. Hallberg¹; ¹ ÄF/S

10:45 **Developments in modelling of thermal radiation from pool and jet fires**
H. Boot¹; ¹ TNO/NL

11:00 **COFFEE BREAK, POSTER AND EXHIBITION**

11:30 **Risk-based structural response against explosion blast loads: systematic one-to-one CFD (FLACS)/NLFEA (Impetus Afea solver) coupling to derive quantified response exceedance**
N. Salaun¹; A. Hanssen²; P. Nilsen³; ¹ GexCon AS/N; ² Impetus Afea AS/N; ³ Statoil ASA/N

12:00 **Analysis Methodology for Hydrogen Accident Scenarios in Complex Industrial Environments**
W. Breitung¹; A. Kotchourko²; J. Yanez²; ¹ simaps GmbH/D; ² Karlsruhe Institute for Technology/D

12:30 **LNG-fueled-engine safety: design of protective measures using CFD**
K. van Wingerden¹; N. Salaun¹; ¹ GexCon AS/N

12:45 **Reliability analysis and risk analysis: integration between hazop and fault tree analysis**
F. Antonello¹; A. Ivaldi¹; D. Dedominicis²; L. Tomiato²; G. Fiocca¹; ¹ ARTES S.r.l./I; ² ARPA Veneto Treviso/I

13:00 **LUNCH, POSTER AND EXHIBITION**

14:30 **Process risk assessment using dynamic simulation of scenarios**
F. Markert¹; I. Kozine¹; N. Duijm¹; ¹ Technical University of Denmark/DK

15:00 **Application of Bayesian network and multi-criteria decision analysis to risk-based design of chemical plants**
N. Khakzad¹; G. Reniers²; ¹ Memorial University, St. John's/CDN; ² TU Delft/NL

15:30 **Developing a Quantitative Risk-based Methodology for Maintenance Scheduling Using Bayesian Network**
R. Abbassi¹; J. Bhandari²; F. Khan³; V. Garaniya²; S. Chai²; ¹ University of Tasmania/AUS; ² Australian Maritime College, University of Tasmania/AUS; ³ Memorial University, St. John's/CDN

16:00 **COFFEE BREAK, POSTER AND EXHIBITION**

16:30 **Atmospheric transport models for hazardous releases: variability and uncertainties – findings of COST Action ES1006 and operational experiences**
K. Baumann-Stanzer¹; S. Trini Castelli²; B. Leitl³; P. Skomorowski¹; E. Polreich¹; P. Carny⁴; ¹ Central Institute for Meteorology and Geodynamics (ZAMG)/AT; ² Institute of Atmospheric Sciences and Climate, National Research Council/I; ³ University of Hamburg/D; ⁴ Abmerit/SK

17:00 **Local-scale hazmat dispersion modeling for first responders based on high-resolution computational fluid dynamics – an overview of CT-Analyst Hamburg**
B. Leitl¹; F. Harms¹; E. Berbekar¹; J. Boris²; G. Patnaik²; K. Obenschain²; S. Fischer³; ¹ University of Hamburg/D; ² U.S. Naval Research Laboratory/USA; ³ Behörde für Inneres und Sport der Freien und Hansestadt Hamburg/D

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**
(3 min/3 Slides for Posters P1 – P12)

18:15 **Refreshment**

19:00 **Conference Dinner at the Schloßbergrestaurant Dattler (Am Schlossberg 1, 79104 Freiburg)**

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Room: Runder Saal

PROCESS SAFETY ENGINEERING

10:00 **Safety issues related to stationary electrochemical energy storage on industrial sites**
 M. Demeestere¹; A. Lecocq¹; G. Fayet¹; ¹ INERIS/F

10:30 **Identification of major accident hazards in industrial biological processes**
 V. Casson Moreno¹; E. Giacomini¹; V. Cozzani¹; ¹ Università di Bologna/I

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **Modern Safety Diagnostics**
 S. Lohmann¹; A. Crosland¹; ¹ Emerson Process Management/D

12:00 **PFD formulae considering imperfect proof tests**
 T. Gabriel¹; U. Menck²; A. Hildebrandt³; G. Schmitt-Pauksztat¹; ¹ Bayer Technology Services GmbH/D; ² The DOW Chemical Company/D; ³ Pepperl+Fuchs/D

12:15 **Probabilistic vulnerability assessment of chemical plants subjected to external acts of interference**
 F. Argenti¹; G. Landucci¹; G. Reniers²; ¹ Università di Pisa/I; ² Delft University of Technology/NL

12:45 **Safety & Security – Is a physically separation of the SIS necessary?**
 V. Hirsch¹; J. Gummersbach¹; T. Bartsch¹; ¹ Siemens AG/D

13:00 LUNCH, POSTER AND EXHIBITION

14:30 **European Program on Evaluation of Safety Valve Stability**
 T. Dannenmaier¹; J. Schmidt¹; J. Denecke¹; O. Odenwald²; ¹ Center of Safety Excellence/D; ² BASF SE/D

15:00 **Practical experiences with the assessment of safety valve design in chemical plants**
 F. Westphal¹; M. Christ¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D

15:15 **The Use of Pressure Relief Systems as Single-Channel, Highly Reliable Safety Devices**
 U. Dünger¹; E. Molter²; V. Stellmacher¹; T. Gabriel²; ¹ Covestro Deutschland AG; ² Bayer Technology Services GmbH

15:30 **Challenges in Sizing Rupture Disk Vent Line Systems Especially for Compressible Two-phase Flow**
 M. Mutegi¹; J. Schmidt¹; J. Denecke¹; ¹ Center of Safety Excellence/D

16:00 COFFEE BREAK, POSTER AND EXHIBITION

16:30 **Accident frequency evaluation to support dynamic risk studies**
 G. Landucci¹; N. Paltrinieri²; ¹ Università di Pisa/I; ² SINTEF Technology and Society, Safety Research/NO

17:00 **Technical-HSE Management System in the Design Phase of an LNG Plant Project**
 M. Tanabe¹; C. Turco¹; ¹ JGC Corporation/J

17:15 **On the Accident at Fukushima Daiichi Nuclear Power Plant from the Inherent Safety Points of View**
 K. Hasegawa¹; ¹ National Research Institute of Fire and Disaster/J

Plenary Room: Rolf Böhme Saal

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8:00 **REGISTRATION**

8:45 **Opening Ceremony**

9:15 **PLENARY TALK**
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 E. Foltin¹; ¹ FFC/D

Room: K9

FIRES AND EXPLOSIONS

10:00 **Influence of material properties of stainless steel on the ignition probability of flammable gas mixtures due to mechanical impacts**
 L. Holländer¹; T. Grunewald²; R. Graetz²; ¹ Federa/D; ² BAM Federal Institute for Materials Research and Testing/D

10:15 **Power-to-Gas: Safety Characteristics of Hydrogen/Natural-Gas Mixtures**
 E. Askar¹; V. Schröder¹; S. Schütz²; A. Seemann³; ¹ BAM Federal Institute for Materials Research and Testing/D; ² DBI Gas- und Umwelttechnik GmbH/D; ³ Berufsgenossenschaft Energie Textil Elektro Medienerzeugnisse BG ETEM/D

10:30 **Effectiveness of increase of relative humidity as a measure to reduce the ignition probability of explosive atmospheres by static electricity**
 M. Glor¹; K. Moritz²; ¹ Swissi Process Safety GmbH/CH; ² Merck KGaA/D

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **Self-ignition behavior of growing dust layers**
 M. Gosewinkel¹; R. Dworschak¹; G. van Laar¹; ¹ Inburex Consulting GmbH/D

11:45 **The relationship between the explosion indices of dispersed dust and particle surface area and the heat of combustion**
 K. Stahmer¹; M. Gerhold¹; ¹ IFA Institute for Occupational Safety and Health of the German Social Accident Insurance/D

12:00 **Determination of material resistivity of fully assembled spiral coiled tubes by measurements and model calculations**
 M. Glor¹; ¹ Swissi Process Safety GmbH/CH

12:15 **Explosivity properties of dusts from torrefied biomass pellets**
 P. Abelha¹; M. Cieplik¹; M. Carbo¹; ¹ Energy Research Centre of The Netherlands (ECN)/NL

12:30 **The Minimum Ignition Energy of Powder Mixtures**
 A. Bisel¹; C. Kubainsky¹; D. Steiner¹; D. Bordeaux²; J. Benabdillah²; ¹ Swissi Process Safety GmbH/CH; ² SD Tech/F

12:45 **Explosion of gas/carbon blacks nanoparticles mixtures: an approach to assess the role of soot formation**
 D. Torrado¹; N. Cuervo¹; S. Pacault¹; A. Dufour¹; P. Glaude¹; C. Murillo¹; ¹ Université de Lorraine/F

13:00 LUNCH, POSTER AND EXHIBITION

14:30 **Safety issue with flammable Solvents in pharmaceutical Production**
 M. Steinkrauss¹; E. Huxol¹; C. Kubainsky¹; G. Suter¹; ¹ Swissi Process Safety GmbH/CH

15:00 **Flexible method for corrective actions ranking in the field of protection against explosion**
 S. Forestier¹; J. Dien¹; G. Suter¹; ¹ Swissi Process Safety GmbH/CH

15:15 **The “PTB Ex Proficiency Testing Scheme” - Interlaboratory Comparisons in the Field of Explosion Protection**
 T. Krause¹; J. Wu¹; L. Zater¹; U. Klausmeyer¹; D. Markus²; ¹ Physikalisch-Technische Bundesanstalt (PTB)/D

15:30 **Sectioning of Potential Explosion Domains to Reduce the Overall Severity of a Vapor Cloud Explosion**
 N. Baron¹; K. Keim²; C. Buchwald²; N. Hertoghe³; ¹ Process Safety Consulting/D; ² ExxonMobil Research and Engineering/B; ³ ExxonMobil Engineering Europe Ltd/B

16:00 COFFEE BREAK, POSTER AND EXHIBITION

16:30 **An experimental study on vapor cloud explosion of propane-oxygen mixtures**
 F. Heymes¹; L. Aprin¹; P. Lauret¹; E. Lapebie²; A. Osmond²; ¹ Ecole des Mines d’Ales/F; ² CEA Gramat/F

17:00 **Determination of toxic products released during combustion of selected pyrethroids**
 M. Sankowska¹; A. Gajek¹; ¹ Central Institute for Labour Protection – National Research Institute (CIOP-PIB)/PL

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**
 (3 min/3 Slides for Posters P1 – P12)

18:15 **Refreshment**

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Plenary Room: Rolf Böhme Saal

8:00	REGISTRATION
8:45	Opening Ceremony
9:15	PLENARY TALK The dilemma of Innovation: Changes – Safely!?! Companies in the tension between a failure culture and security claim E. Foltin ¹ ; ¹ FFC/D
	Room: K2
	LEARNING FROM ACCIDENTS AND KNOWLEDGE TRANSFER
10:00	History does not have to repeat itself: 20 years contribution of the online DECHEMA Incident Database K. Mitropetros ¹ ; H. Gasche ² ; ¹ DECHEMA e.V./D; ² Bayer Technology Services GmbH/D
10:30	Progress in Process Safety through statistical evaluation of incidents and Performance Indicators K. Jörg ¹ ; ¹ BASF SE/D
10:45	Industrial accidents – was Bhopal the worst that can happen? A. Trujillo ¹ ; ¹ Dekra Insight/B
11:00	COFFEE BREAK, POSTER AND EXHIBITION
11:30	Lessons learned from major accidents relating to ageing of chemical plants Z. Gyenes ¹ ; M. Heraty Wood ¹ ; ¹ EC DG Joint Research Centre/I
12:00	Learning from accidents – reporting is not enough M. Hailwood ¹ ; ¹ LUBW Landesanstalt für Umwelt, Messungen und Naturschutz Baden Württemberg/D
12:30	Disseminating Competency in Process Safety, Experiences from a relatively small linguistic region B. Weibull ¹ ; ¹ Swedish Association for Process Safety/S
13:00	LUNCH, POSTER AND EXHIBITION
14:30	Incident cause pattern analysis at Bayer J. Weppelmann ¹ ; ¹ Bayer Technology Services GmbH/D
15:00	Root Cause Analysis – the central instrument in a larger orchestra T. Hill ¹ ; ¹ BASF SE/D
15:30	Learnings from Cleansheet Reviews T. Müller ¹ ; ¹ BASF SE/D
16:00	COFFEE BREAK, POSTER AND EXHIBITION
16:30	The Pitfalls of Risk Based Inspection I. Clarke ¹ ; ¹ Zurich Risk Engineering/UK
17:00	Analysis methods for Human factors in chemical process accidents M. Nakagawa ¹ ; T. Shibata ² ; ¹ Mitsubishi Chemical Corporation/J; ² Mitsubishi Research Institute/J
	Plenary Room: Rolf Böhme Saal
17:30	Poster Short Presentations (3 min/3 Slides for Posters P1 – P12)
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E. Foltin¹; ¹ FFC/D

Room: K5

11:00 COFFEE BREAK, POSTER AND EXHIBITION

SPECIAL SESSION: on Process Safety Education

11:30 **PANEL DISCUSSION**

Loss Prevention and Safety Education: the global challenge

P. Amyotte¹; ¹ Dalhousie University and President of Engineers Canada/CN
G. Reniers²; ² TU Delft and Director of Leiden-Delft-Erasmus Safety and Security Centre/NL
U. Krause³; ³ Otto-von-Guericke-University Magdeburg and DECHEMA Section "Process and Plant Safety"/D
N. Atkinson⁴; ⁴ IChemE Director of Qualifications and International Development/UK
V. Cozzani⁵; ⁵ University of Bologna and President of CISAP-AIDIC/I
A representative of the European Process Safety Centre

13:00 LUNCH, POSTER AND EXHIBITION

SPECIAL SESSION: SAPHEDRA Project

14:30 **Overview of the SAPHEDRA Project**

S. Duplantier¹; ¹ INERIS/F

14:45 **Analysis of consequence modelling approaches and experimental campaigns**

K. Habib¹; H. Boot²; ¹ BAM Federal Institute for Materials Research and Testing/D; ² TNO/NL

15:00 **Development of a model evaluation protocol for consequence modelling**

S. Coldrick¹; ¹ HSL/UK

15:15 **Questions and Answers followed by a panel discussion**

Moderators: V. Cozzani¹ and E. Kooij²; ¹ Universita Bologna/I; ² RIVM/NL

16:00 COFFEE BREAK, POSTER AND EXHIBITION

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**

(3 min/3 Slides for Posters P1 – P12)

18:15 **Refreshment**

19:00 **Conference Dinner at the Schloßbergrestaurant Dattler (Am Schlossberg 1, 79104 Freiburg)**

Tuesday, 7 June 2016

Plenary Room: Rolf Böhme Saal

8:45 **PLENARY TALK**

Past, Present and Future of Process & Plant Safety – an Industry View

P.G. Schmelzer¹; K. Fischer²; T. Hoechst³; R. Hoss⁴; R. Kappelmaier⁵; K.-J. Niemitz¹; M. Wilhelm⁶;

¹ Bayer HealthCare AG/D; ² BTS/D; ³ VCI/D; ⁴ Merck/D; ⁵ CMK/D; ⁶ BASF/D

9:45 **2016 EFCE Excellence Award in Process Safety**

Plenary Room: Rolf Böhme Saal

SIMULATION AND MODELING

10:00 **KEYNOTE**

Gas phase detonations in pipes: the 8 possible different pressure scenarios and their static equivalent pressures determined by the pipe wall deformation method

H. Schildberg¹; ¹ BASF SE/D

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **Modelling and validation of dispersion following an instantaneous release from a pressurised vessel**

H. Witlox¹; M. Harper²; D. Webber³; ¹ DNV GL/UK; ² DNVGL Software/UK; ³ Integral Science and Software Ltd./UK

12:00 **Consequences assessment of a cold BLEVE. Can we do it better?**

A. Laurent¹; L. Perrin¹; O. Dufaud¹; ¹ Université de Lorraine/F

12:30 **CFD to improve the repeatability and accuracy of dust explosion tests in the 20-liters sphere**

C. Murillo¹; N. Bardin-monnier¹; C. Blanchard¹; D. Funfschilling¹; F. Munoz²; N. Rios²; ¹ Université de Lorraine/F; ² Universidad de los Andes/CO

13:00 LUNCH, POSTER AND EXHIBITION

14:30 **QSPR model for regulatory purpose: from development to integration into the QSAR Toolbox**

G. Fayet¹; P. Rotureau¹; ¹ INERIS/F

15:00 **Molecular modeling as a complementary approach of experimental evaluation of incompatibilities of ammonium nitrate**

P. Rotureau¹; S. Cagnina¹; G. Fayet¹; C. Adamo²; ¹ INERIS/F; ² Institut de Recherche Chimie Paris CNRS Chimie Paris-Tech/F

15:30 **Thermal process safety based on Reaction Kinetics and Reactor Dynamic**

C. Guinand¹; M. Dabros¹; B. Roduit²; T. Meyer³; F. Stoessel⁴; ¹ Institut ChemTech/CH; ² AKTS Inc./CH; ³ EPFL/CH; ⁴ Swissi Process Safety GmbH/CH

16:00 COFFEE BREAK, POSTER AND EXHIBITION

16:30 **Modelling of stably-stratified atmospheric boundary layers with commercial CFD software for use in risk assessment**

R. Batt¹; S. Gant¹; J. Lacombe²; B. Truchot²; ¹ Health and Safety Laboratory (HSL)/UK; ² INERIS/F

16:45 **Predicting evaporation rates from pools**

B. Mazzarotta¹; R. Bubbico¹; ¹ Università di Roma „La Sapienza“/I

17:00 **Experimental evaluation of LPG release and dispersion in the enclosed car parks**

D. Brzezinska¹; A. Markowski¹; ¹ Lodz University of Technology/PL

17:15 **Modelling small-scale flashing propane jets**

S. Coldrick¹; ¹ Health and Safety Laboratory/UK

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**

(3 min/3 Slides for Posters P13 – P34)

19:00 **Poster Party (19:00 -21:00)**

within the poster exhibition with fingerfood and drinks

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¹ Bayer HealthCare AG/D; ² BTS/D; ³ VCI/D; ⁴ Merck/D; ⁵ CMK/D; ⁶ BASF/D

9:45 **2016 EFCE Excellence Award in Process Safety**

Room: Runder Saal

PROCESS SAFETY ENGINEERING

10:00 **Identifying hazardous conditions for rapid compression scenarios of chemically unstable gases in industrial scaled pipes**
 M. Kluge¹; M. Kreißig¹; T. Spoomaker²; C. Liebner¹; ¹ BAM Federal Institute for Materials Research and Testing/D;
² Chairman PlasticsEurope Fluoropolymers TFE Safety Task Force/NL

10:30 **Facing the hazards of biphasic, unstable, highly exothermic process: the case of epoxidation of vegetable oils**
 E. Salzano¹; V. Russo²; R. Tesser²; R. Turco²; M. Di Serio²; ¹ Institute of Research on Combustion, National Research Council/I;
² University of Naples "Federico II" – Department of Chemistry, Complesso Universitario Monte S. Angelo/I

10:45 **Thermal stability predictions for inherently safe process design using molecular-based approaches**
 N. Baati¹; A. Nanchen²; F. Stoessel²; T. Meyer¹; ¹ EPFL/CH; ² Swissi Process Safety GmbH/CH

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **New findings for the use of explosion isolation systems at explosion vented vessels**
 M. Sippel¹; P. Schepp²; U. Hesener¹; ¹ DEKRA EXAM GmbH/D; ² FSA GmbH/D

12:00 **Sizing of explosion pressure relief using the efflux function**
 R. Blanchard¹; H. Schildberg¹; R. Zeps²; K. Holtappels²; M. Kluge²; ¹ BASF SE/D; ² BAM Federal Institute for Materials Research and Testing/D

12:15 **Optimization of Cryogenic Spill Protection Insulation Thickness**
 Y. Hiroya¹; M. Tanabe¹; T. Miyashita¹; S. Kataoka¹; Y. Yamada¹; ¹ JGC Corporation/J

12:30 **New visualizations in the development of function and failure in process design and operations**
 I. Cameron¹; E. Németh¹; B. Seligmann²; ¹ The University of Queensland/AUS; ² Curtin University/AUS

12:45 **Automated model-based HAZOP study in process hazard analysis**
 J. Janošovský¹; J. Labovsky¹; L. Jelemensky¹; ¹ Slovak University of Technology/SK

13:00 LUNCH, POSTER AND EXHIBITION

14:30 **Determination of ignition temperature in micro reactors**
 E. Balcazar¹; F. Neher²; C. Liebner¹; H. Hieronymus¹; E. Klemm²; ¹ BAM Federal Institute for Materials Research and Testing/D;
² University of Stuttgart/D

14:45 **Determination of the self-ignition behaviour of bulk materials from heat storage tests below atmospheric pressure**
 S. Seitz¹; J. Franke¹; G. Giebisch¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D

15:00 **A Methodology for Determining Blast and Fire Risk to Safety Critical Equipment in the Process Industries**
 P. Hodge¹; T. Anderson¹; P. Smith²; K. Vilas²; D. Black¹; M. Gandhi¹; A. Raibagkar¹; ¹ Baker Engineering and Risk Consultants/USA;
² BakerRisk Europe Ltd./UK

15:30 **Operational risks in QRAs**
 A. Casal¹; H. Olsen²; ¹ Lloyd's Register Consulting/E; ² Lloyd's Register Consulting - Energy/UK

15:45 **Effective Implementation of Inherently Safer Design during Design Phase of Modularized Onshore LNG Projects**
 M. Tanabe¹; A. Miyake²; ¹ JGC Corporation/J; ² Yokohama National University/J

16:00 COFFEE BREAK, POSTER AND EXHIBITION

REGULATORY ISSUES

16:30 **Handling of Safety reports – The challenge of legal compliance**
 C. Schock¹; G. Carusotto¹; ¹ Wacker Chemie AG/D

17:00 **Determination of Explosion protection zones according to DGVV Regel 113-001 with examples**
 B. Poga¹; ¹ Berufsgenossenschaft Rohstoffe und chemische Industrie/D

17:15 **European Critical Infrastructure Risk and Safety Management**
 D. Rehak¹; M. Hromada²; P. Novotny¹; ¹ VSB - Technical University of Ostrava, Faculty of Safety Engineering/CZ;
² Tomas Bata University in Zlín, Faculty of Applied Informatics/CZ

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9:45	2016 EFCE Excellence Award in Process Safety
	Room: K9
	FIRES AND EXPLOSIONS
10:00	Detonation: Should it be included in Hazard and Risk Assessment V. Tam ¹ ; M. Johnson ¹ ; ¹ DNV GL/UK
10:30	Potential for major explosions from crude oil pipeline releases in varied terrain O. Hansen ¹ ; M. Kjellander ¹ ; ¹ Lloyd's Register Consulting, /N
10:45	Ignition frequency in Process Risk Analysis at Solvay S. Egan ¹ ; ¹ SOLVAY HSE DEPARTMENT/F
11:00	COFFEE BREAK, POSTER AND EXHIBITION
11:30	Estimating Characteristics of Industrial BLEVEs and VCEs from Observed Condensation Clouds A. Birk ¹ ; ¹ Queen's University/CDN
12:00	Detection of smouldering fires by carbon monoxide concentration measurement J. Vingerhoets ¹ ; J. Snoeys ¹ ; S. Minten ¹ ; ¹ Fike/B
12:15	Fire Protection in the Chemical Industry G. Wehmeier ¹ ; K. Mitropetros ² ; ¹ BASF Lampertheim GmbH/D; ² DECHEMA e.V./D
12:30	QUICK ASSESSMENT OF FIRE HAZARD IN CHEMICAL AND PHARMACEUTICAL WAREHOUSES A. Dusso ¹ ; S. Grimaz ¹ ; E. Salzano ² ; ¹ SPRINT-Lab, University of Udine. Udine/IT; ² Institute of Research on Combustion, National Research Council/IT
13:00	LUNCH, POSTER AND EXHIBITION
14:30	Explosibility and fire behavior of some pyrethroids, active agents of plant protection products M. Celiński ¹ ; W. Domański ¹ ; ¹ Central Institute for Labour Protection – National Research Institute/PL
14:45	Fire risk assessment of photovoltaic plants. A case study moving from two large fires: from accident investigation and forensic engineering to fire risk assessment for reconstruction and permitting purposes L. Fiorentini ¹ ; L. Marmo ² ; E. Danzi ² ; V. Puccia ³ ; ¹ Tecsa Srl/I; ² Politecnico di Torino/I; ³ National Fire Corps/I
15:15	Fire Testing of Total Containment Pressure Vessels A. Birk ¹ ; F. Gonzalez ² ; A. Prabhakaran ³ ; F. Otremba ⁴ ; I. Bradley ⁵ ; L. Bisby ⁵ ¹ Queen's University/CDN; ² US DOT Federal Railroad Administration/USA; ³ Sharma and Associates Inc./USA; ⁴ BAM Federal Institute for Materials Research and Testing/D; ⁵ University of Edinburgh/UK
15:30	Near Field Blast from BLEVE A. Birk ¹ ; F. Heymes ² ; L. Aprin ² ; P. Lauret ² ; R. Eyssette ³ ; P. Slangen ² ; ¹ Queen's University/CDN; ² Ecole des Mines d'Ales/F; ³ Queen's University and Ecole des Mines d'Ales/USA
15:45	ESCALATION SCENARIOS TRIGGERED BY THERMAL EXPLOSIONS IN BATCH AND SEMI-BATCH REACTORS V. Casson Moreno ¹ ; A. Tugnoli ¹ ; E. Salzano ² ; V. Cozzani ¹ ; ¹ University of Bologna/I; ² Institute of Research on Combustion, National Research Council/I
16:00	COFFEE BREAK, POSTER AND EXHIBITION
16:30	Emergency Runaway Reaction - What precedes? What follows? E. Fiedler ¹ ; ¹ BASF SE/D
17:00	Modell-Based Prediction of the Adiabatic Induction Period and SADT of Dicumyl Peroxide Solution and Comparison to Large-Scale Experiments performed using 216.5-Liter Barrels in the H.1 Test S. Dürrstein ¹ ; C. Kappler ¹ ; I. Neuhaus ¹ ; M. Malow ² ; H. Dr. Michael-Schulz ² ; M. Gödde ¹ ; ¹ BASF SE/D; ² BAM Federal Institute for Materials Research and Testing/D
	Plenary Room: Rolf Böhme Saal
17:30	Poster Short Presentations (3 min/3 Slides for Posters P13 – P34)
19:00	Poster Party (19:00 -21:00) within the poster exhibition with fingerfood and drinks

Tuesday, 7 June 2016

Plenary Room: Rolf Böhme Saal

8:45 **PLENARY TALK**
Past, Present and Future of Process & Plant Safety – an Industry View
 P.G. Schmelzer¹; K. Fischer²; T. Hoechst³; R. Hoss⁴; R. Kappelmaier⁵; K.-J. Niemitz¹; M. Wilhelm⁶;
¹ Bayer HealthCare AG/D; ² BTS/D; ³ VCI/D; ⁴ Merck/D; ⁵ CMK/D; ⁶ BASF/D

9:45 **2016 EFCE Excellence Award in Process Safety**

Room: K2

LEARNING FROM ACCIDENTS AND KNOWLEDGE TRANSFER

10:00 **Drum burst due to runaway reaction and the limits of MOC**
 A. Pey¹; ¹ TÜV SÜD Chemie Service GmbH/D

10:30 **Thermal stability of amine compounds and dichloromethane**
 S. Dreisch¹; C. Hernandez²; J. Horn¹; S. Neuenfeld²; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D; ² Merck KGaA/D

10:45 **Crosslinking and Decomposition of Epoxy Resins Induced by Contamination with Water – Assessment of an Industrial Scale Scenario**
 P. Tanasini¹; G. Widmer¹; R. Raballand¹; ¹ Huntsman/UK

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **What Do Gas Blows, Iron Dust Accumulations and Sulfidation Corrosion Have In Common?**
 P. Amyotte¹; F. Khan²; ¹ Dalhousie University/CDN; ² Memorial University, St. John's/CDN

12:00 **A thorough analysis of the engineering solutions deployed to stop the oil spill following the Deepwater Horizon disaster**
 E. Thibaut¹; A. Napoli¹; F. Guarnieri¹; ¹ MINES ParisTech, Centre for research on risks and crises – PSL Research University/F

12:30 **Kaohsiung Vapor Explosion - A Detailed Analysis of the Tragedy in the Harbour City**
 Y. HUI NING¹; J. Chen²; T. Kao¹; H. Chiu¹; H. Tsai¹; J. Chen¹; ¹ National Kaohsiung First University of Science & Technology/RC

12:45 **Oppau 1921: Old facts revisited**
 U. Hörcher¹; ¹ BASF SE/D

13:00 LUNCH, POSTER AND EXHIBITION

MANAGEMENT AND COMMUNICATION OF RISK AND SAFETY

14:30 **How can we improve HAZOP, our old work horse, and do more with its results? An overview of recent developments**
 H. Pasman¹; W. Rogers¹; ¹ Texas A&M University/USA

15:00 **Can Process Plant QRA Reduce Risk? – Experience from 102 QRA Studies Over 36 Years**
 J. Taylor¹; ¹ ITSA/DK

15:15 **Quantitative Risk Assessment of Cascading Events triggered by Floods**
 G. Landucci¹; G. Antonioni²; A. Necci²; V. Cozzani²; ¹ Università di Pisa/D; ² Università di Bologna/I

15:30 **Comparing consequences of different liquid tank explosions triggered by lava inundations**
 M. Milazzo¹; G. Ancione¹; G. Maschio²; ¹ Università di Messina/I; ² University of Padova/I

15:45 **A Systematic Approach to Evaluate Safety Investments Based on the Disproportion Factor**
 L. Talarico¹; G. Reniers²; ¹ University of Antwerp/NL; ² TUDelft/NL

16:00 COFFEE BREAK, POSTER AND EXHIBITION

16:30 **Risk assessment model regarding allowable extent of construction activities during normal operation in the process industry**
 P. Berntsson¹; C. Johansson²; B. Weibull³; ¹ COWI AB/S; ² AkzoNobel Functional Chemicals AB/S; ³ Swedish Association for Process Safety/S

17:00 **Design of a semi-virtual training environment (serious game) for decision-makers facing up a major crisis**
 F. Tena-Chollet¹; N. Fréalle¹; A. Bony-Dandrieux¹; J. Tixier¹; ¹ Ecole des Mines d'Ales/F

17:15 **Incident Investigation on the basis of Business Process Model for Plant Lifecycle Engineering**
 T. Fuchino¹; K. Takeda²; Y. Shimada³; ¹ Tokyo Institute of Technology/J; ² Shizuoka University/J; ³ National Institute of Occupational Safety and Health/J

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**
 (3 min/3 Slides for Posters P13 – P34)

19:00 **Poster Party (19:00 -21:00)**
 within the poster exhibition with fingerfood and drinks

Tuesday, 7 June 2016

Plenary Room: Rolf Böhme Saal

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 P.G. Schmelzer¹; K. Fischer²; T. Hoechst³; R. Hoss⁴; R. Kappelmaier⁵; K.-J. Niemitz¹; M. Wilhelm⁶;
¹ Bayer HealthCare AG/D; ² BTS/D; ³ VCI/D; ⁴ Merck/D; ⁵ CMK/D; ⁶ BASF/D

9:45 **2016 EFCE Excellence Award in Process Safety**

Room: K5

11:00 COFFEE BREAK, POSTER AND EXHIBITION

13:00 LUNCH, POSTER AND EXHIBITION

Special Session: CEFC - “Process Safety Performance Indicators – Implementation in Europe”

14:30 **Developments in process safety performance indicators and reporting**
 P. Knijff¹, ¹EPSC/UK

14:45 **Process Safety performance and data collection: the Federchimica experience**
 G. Astarita¹, ¹Federchimica/IT

15:00 **Process Safety performance and data collection: the Belgian experience**
 G. Boogaerts¹, ¹Essenscia/BE

15:15 **Process Safety performance and data collection: the French experience**
 G. Dussin¹, ¹UIC/F

Implementation in Switzerland
 L. Kren¹, ¹Scienceindustries/CH

15:30 **Process Safety performance and data collection: the UK experience**
 P. Scott¹, ¹Chemical Industries Association/UK

15:45 **Implementation in Germany and Current Status**
 T. Höchst¹, ¹VCI/D

16:00 COFFEE BREAK, POSTER AND EXHIBITION

16:30 **Experience exchange on PSI's in European Associations and path forward**
 H.-E. Gasche¹, ¹Bayer Technology Services GmbH/D

16:45 **Questions & Discussion – with all presenters**

Plenary Room: Rolf Böhme Saal

17:30 **Poster Short Presentations**
 (3 min/3 Slides for Posters P13 – P34)

19:00 **Poster Party (19:00 -21:00)**
 within the poster exhibition with fingerfood and drinks

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- Chemical reactions
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Wednesday, 8 June 2016

	Plenary Room: Rolf Böhme Saal
9:00	PLENARY TALK The Convention on the Transboundary Effects of Industrial Accidents and its implementation – the case of Switzerland F. Ilg-Hirsch ¹ ; M. Merkofer ² ; ¹ UNECE/CH; ² Swiss Federal Office for the Environment/CH
	Plenary Room: Rolf Böhme Saal
	SIMULATION AND MODELING
10:00	A LARGE BLAST SIMULATOR FOR THE EXPERIMENTAL INVESTIGATION OF EXPLOSIVELY LOADED BUILDING COMPONENTS A. Stolz ¹ ; O. Millon ¹ ; A. Klomfass ¹ ; ¹ Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI/D
10:30	CFD modelling of blast waves from BLEVEs O. Hansen ¹ ; M. Kjellander ¹ ; ¹ Lloyd’s Register Consulting/N
11:00	COFFEE BREAK, POSTER AND EXHIBITION
11:30	The influence of explosion relief vent layouts on explosion overpressures in large biomass storage vessels K. van Wingerden ¹ ; P. Middha ¹ ; R. Samaraweera ¹ ; C. Coffey ¹ ; D. Price ¹ ; ¹ GexCon/N
12:00	Debris throw model for accidental explosions in a complex industrial environment M. von Ramin ¹ ; A. Stolz ¹ ; ¹ Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI/D
12:30	Improved Explosion Consequence Analysis with combined CFD and Damage Models A. Klomfass ¹ ; ¹ Fraunhofer Institute for High-Speed Dynamics, Ernst-Mach-Institut, EMI/D
	Plenary Room: Rolf Böhme Saal
13:00	Closing Ceremony incl. Poster Award
13:30	Lunch
15:00	End of the Conference

Wednesday, 8 June 2016

Plenary Room: Rolf Böhme Saal

9:00 **PLENARY TALK**
The Convention on the Transboundary Effects of Industrial Accidents and its implementation – the case of Switzerland
 F. Ilg-Hirsch¹; M. Merkofer²; ¹ UNECE/CH; ² Swiss Federal Office for the Environment/CH

Room: Runder Saal

HUMAN AND ORGANISATIONAL FACTORS

10:00 **Experiences of a regulatory agency with safety culture assessment**
 J. van Steen¹; S. Post¹; M. Twisk¹; Y. van Duijn¹; ¹ DCMR Environmental Protection Agency/NL

10:30 **BeSafe! – Merck’s „Safety Culture“- program to increase safety awareness and performance of all employees**
 R. Hoss¹; ¹ Merck KGaA/D

10:45 **The Linde Engineering Behaviour Based Safety Program „BeSafe“**
 K. Gransee¹; J. Thieme¹; ¹ Linde/D

11:00 COFFEE BREAK, POSTER AND EXHIBITION

11:30 **Issues in assuring human controls in layers-of-defences strategies**
 R. McLeod¹; ¹ Ron McLeod Ltd./UK

12:00 **Functional model for organisational and safety culture**
 P. Porkka¹; ¹ Tampere University of Technology/FIN

12:15 **Pushing Process Limits Without Compromising Safety**
 A. Coward¹; H. R. Perez¹; ¹ PAS Inc./UK

12:30 **Consequences of ignoring the complexity of human behaviour for industrial safety and security**
 S. Festag¹; S. Hartwig¹; ¹ Bergische University of Wuppertal/D

Plenary Room: Rolf Böhme Saal

13:00 **Closing Ceremony incl. Poster Award**

13:30 **Lunch**

15:00 **End of the Conference**

Wednesday, 8 June 2016

	Plenary Room: Rolf Böhme Saal
9:00	PLENARY TALK The Convention on the Transboundary Effects of Industrial Accidents and its implementation – the case of Switzerland F. Ilg-Hirsch ¹ ; M. Merkofer ² ; ¹ UNECE/CH; ² Swiss Federal Office for the Environment/CH
	Room: K9
	MANAGEMENT AND COMMUNICATION OF RISK AND SAFETY
10:00	Global competence management for Process and Plant Safety within the Bayer Group H. Gasche ¹ ; J. Buhn ¹ ; J. Kussi ¹ ; J. Weppelmann ¹ ; ¹ Bayer Technology Services GmbH/D
10:30	What drives Process Safety Performance ? A view from experience at BASF H. Schwarz ¹ ; ¹ BASF SE, Ludwigshafen/D
11:00	COFFEE BREAK, POSTER AND EXHIBITION
11:30	Process Risk Analysis within Solvay S. Egan ¹ ; ¹ SOLVAY HSE DEPARTMENT, /F
11:45	Managing incidents with SPIRIT C. Schock ¹ ; ¹ Wacker Chemie AG/D
12:00	Top-5 things to improve safety without using a calculator S. Lohmann ¹ ; R. Cockman ¹ ; ¹ Emerson Process Management/D
12:15	An Innovative Single Trend Lagging Indicator for Performance of Process Safety F. Holtzhausen ¹ ; M. Bester ¹ ; K.H. Bruehl ¹ ; ¹ Sasol Chemical Industries (Pty) Ltd/ZA
12:30	Process safety in engineering education - pro's and con's of two different approaches U. Krause ¹ ; ¹ Otto von Guericke University/D
	Plenary Room: Rolf Böhme Saal
13:00	Closing Ceremony incl. Poster Award
13:30	Lunch
15:00	End of the Conference



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Wednesday, 8 June 2016

Plenary Room: Rolf Böhme Saal

9:00 **PLENARY TALK**
The Convention on the Transboundary Effects of Industrial Accidents and its implementation – the case of Switzerland
 F. Ilg-Hirsch¹; M. Merkofer²; ¹ UNECE/CH; ² Swiss Federal Office for the Environment/CH

Room: K2

REGULATORY ISSUES

10:00 **External safety from the perspective of public “all hazard” risk management: lessons on spatial planning for rail transport of hazardous substances**
 R. Houdijk¹; ¹ Itineris Health and Safety/NL

10:30 **Societal Risk and Urban Land Use Planning: creating useful pro-active risk information**
 R. Geerts¹; J. Heitink¹; L. Gooijer²; A. Van Vliet²; R. Scheres¹; D. De Boer³; ¹ AVIV bv/NL; ² National Institute for Public Health and the Environment/NL; ³ BSafe safety consultants/NL

11:00 COFFEE BREAK, POSTER AND EXHIBITION

SIMULATION AND MODELING

11:30 **Pool evaporation at higher vapour pressures**
 K. Habib¹; B. Schalau¹; ¹ BAM Federal Institute for Materials Research and Testing/D

11:45 **Determination of the smouldering temperature on the basis of adiabatic tests**
 L. Engel¹; S. Kimpel¹; J. Franke¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D

12:00 **New Kinetic Approach for Evaluation of Hazard Indicators Based on Merging DSC and ARC or Large Scale Tests**
 B. Roduit¹; M. Hartmann¹; P. Folly²; A. Sarbach²; P. Brodard³; R. Baltensperger³; ¹ AKTS AG/CH; ² armasuisse, Science and Technology Centre/CH; ³ University of Applied Sciences of Western Switzerland/CH

12:15 **An alternative way to determine the Self-Accelerating Decomposition Temperature by using the adiabatic heat-pressure accumulation test**
 S. Kimpel¹; C. Hernandez¹; J. Horn¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D

12:30 **An alternative way to determine the Deflagration Behaviour**
 S. Kimpel¹; J. Horn¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D

Plenary Room: Rolf Böhme Saal

13:00 **Closing Ceremony incl. Poster Award**

13:30 **Lunch**

15:00 **End of the Conference**

Poster, 6-8 June 2016

MANAGEMENT AND COMMUNICATION OF RISK AND SAFETY

- P1 **Developing an EVADE (EVALuation and DEbriefing) method to assess trainees during crisis management training for major hazards and feedback them**
D. Lapierre¹; A. Bony-Dandrieux¹; F. Tena-Chollet¹; J. Tixier¹; K. Weiss²; N. Fréal³; ¹ Ecole des Mines d'Alès/F; ² Université de Nîmes/F; ³ Ecole des mines d'Alès//F
- P2 **Research and Application of an advanced LOPA Method for Risk Assessment of Chemical Process**
S. Tong¹; Z. Wu¹; R. Wang¹; ¹ China Academy of Safety Science and Technology/CN

LEARNING FROM ACCIDENTS AND KNOWLEDGE TRANSFER

- P3 **DUST EXPLOSION INVESTIGATION IN TURKEY**
Z. MERCAN¹; ¹ TR Ministry of Labour and Social Security/TR
- P4 **Seveso accident analysis and safety management system: a case study**
M. Vallerotonda¹; A. Pirone¹; D. De Santis¹; M. Vallerotonda¹; P. Bragatto¹; ¹ INAIL/I
- P5 **PSM EDUCATION AND TRAINING: TURKEY CASE**
M. Ercan Kalkan¹; V. Deniz¹; ¹ Kocaeli University Chemical Engineering Department/TR

FIRES AND EXPLOSIONS

- P6 **Liquid Hydrocarbons Storage Tank Fires – How Prepared is Your Facility?**
D. Nwabueze¹; ¹ Naoc Limited/NGR
- P7 **Models to estimate the Lower Explosion Limits of dusts, gases and hybrid mixtures**
E. Addai¹; D. Gabel¹; U. Krause²; ¹ University of Magdeburg/D; ² Otto von Guericke University/D
- P8 **Dust explosions in the process industries: Research in the twenty-first century**
T. Skjold¹; R. Eckhoff²; ¹ GexCon AS/N; ² University of Bergen/N
- P9 **Ignition of a cloud of dry powder using super brush discharges**
S. Forestier¹; M. Glor¹; J. Dien¹; ¹ Swissi Process Safety GmbH/CH
- P10 **Study of the Aging Impact on the Extinction Efficiency of an Extinguishing Powder for Sodium Fire**
N. Kusumanindyah¹; L. Brissonneau¹; T. Gilardi¹; C. Gatamel²; H. Berthiaux²; ¹ CEA, DEN, Cadarache DTN/SMTA/LIPC/F; ² Ecole des Mines d'Albi-Carmaux/F
- P11 **Predicting graphite/metals explosion severity: from experimentation to modelling**
M. D'Amico¹; O. Dufaud²; J. Latché³; T. Sophie¹; L. Perrin²; ¹ Institut de Radioprotection et Sûreté Nucléaire (IRSN)/F; ² Université de Lorraine/F; ³ Institut de Radioprotection et Sûreté Nucléaire (IRSN)/F
- P12 **Avoidance of Ignition Sources – Use of a Dust Filter without Inerting Measures for Dedusting Offgas of a Silo Containing Combustible Dusts**
M. Höding¹; C. Walther¹; G. Malte¹; ¹ Bayer Technology Services GmbH/D
- P35 **Structural behaviour of multi-storey buildings subjected to internal explosions**
M. Andreotti¹; P. Mocellin¹; M. Zanini¹; C. Vianello¹; C. Pellegrino¹; C. Modena¹; ¹ University of Padova/I

SIMULATION AND MODELING

- P13 **CFD based reproduction of Amuay refinery accident 2012**
K. Mishra¹; S. Schmidt¹; K. Wehrstedt¹; ¹ BAM Federal Institute for Materials Research and Testing/D
- P14 **A novel index based framework for assessing hazards of toxic and flammable gaseous releases in the process industry.**
E. Palazzi¹; F. Curro¹; B. Fabiano¹; ¹ DICCA Polytechnic School – Genoa University/I
- P15 **A few fundamental aspects related to the modelling of an accidental massive jet release of nanoparticles**
H. Le¹; J. Lacomé¹; A. Vignes¹; B. Debray¹; B. Truchot¹; P. Fedez²; ¹ INERIS/F; ² CNRS - I.M.F.T. Toulouse/F
- P16 **LNG Vapour Cloud Dispersion Modelling and Simulations with OpenFOAM**
F. Nazarpour¹; S. Dembele¹; J. Wen²; D. Udechukwu¹; ¹ Kingston University London/UK; ² University of Warwick/UK
- P17 **Modelling transient leaks of multi-component fluids including time-varying phase composition**
J. Stene¹; M. Harper²; H. Witlox¹; ¹ DNV GL/UK; ² DNV GL Software/UK

- P18 **Multicomponent hydrocarbon pool fire: primary and secondary effect modelling with enhanced view factor evaluation**
B. Fabiano¹; C. Caviglione¹; F. Curro¹; E. Palazzi¹; ¹ DICCA Polytechnic School – Genoa University/I
- P19 **Atmospheric Powder Dispersion in an Urban Area**
P. Lauret¹; M. Perrin²; L. Aprin¹; F. Heymes¹; S. Forestier³; P. Lauret¹; A. Pey³; ¹ Ecole des Mines d'Ales/F; ² Novartis,/CH;
³ Swissi Process Safety GmbH/CH
- P20 **Evaluation of deflagration behaviour using different sized autoclaves**
S. Salg¹; M. Malow²; H. Dr. Michael-Schulz²; R. Schomäcker³; ¹ Fed/D; ² BAM Federal Institute for Materials Research and Testing/D;
³ Technische Universität Berlin/D
- P21 **ARATech2013 – a web-based tool for risk assessment**
V. Frydrych¹; P. Strakos¹; A. Bouskova¹; ¹ GEOMEDIA Ltd./CZ
- P22 **Self-Ignition caused by Solar Radiation**
G. Krause¹; ¹ dr. krause gmbh/D

PROCESS SAFETY ENGINEERING

- P23 **Process Safety Architectures“ system neutral solution comparison**
F. Handermann¹; ¹ Siemens AG/D
- P24 **Effects of Release Flow Rate on Evaporation Velocity for a Spreading Pool of Liquid Nitrogen**
D. Nguyen¹; M. Kim¹; B. Choi¹; ¹ Korea University of Science and Technology/ROK
- P25 **Aging Equipment in Facilities and Daily Maintenance – Latent Risks on Sites with Major-accident Hazards acc. Directive 2012/18/EU**
R. Semmler¹; ¹ TÜV SÜD Chemie Service GmbH/D
- P26 **CO₂ transportation hazards in CCS and EOR operations: preliminary lab – scale experimental investigation of CO₂ pressurized releases**
P. Mocellin¹; C. Vianello¹; G. Maschio¹; ¹ University of Padova/I
- P27 **Kinetics and Safety Analysis of Peracetic Acid**
C. Vianello¹; E. Salzano²; G. Maschio¹; ¹ University of Padova/I; ² Institute of Research on Combustion, National Research Council/I
- P28 **Design of pressure relief devices for chemical reactors on basis of adiabatic tests – is this always conservative?**
S. Seitz¹; F. Westphal¹; ¹ consilab Gesellschaft für Anlagensicherheit mbH/D
- P29 **Tcf and MTSR of toluene nitration in mixed acid**
L. Chen¹; Y. Zhou¹; W. Chen¹; T. Yang¹; S. Xu¹; G. Rao¹; ¹ Nanjing University of Science and Technology/CN
- P30 **Safety Instrumented System- requirements for successful operation and maintenance**
R. Selega¹; ¹ ABB/PL
- P31 **Risk Assessment of steam pipelines in industrial areas**
R. Geerts¹; J. Heitink¹; ¹ AVIV bv/NL
- P32 **Optimal Safe Layouts with Heat Exchanger Networks Synthesis Having Isothermal Process Streams**
A. Inchaurregui-méndez¹; R. Vazquez-Roman¹; J. Ponce-ortega²; S. Mannan³; ¹ Instituto Tecnológico de Celaya/MEX;
² Universidad Michoacana de San Nicolás de Hidalgo/MEX; ³ Texas A&M University College Station/USA
- P33 **Emergency Shutdown Valves for Pump and Compressor Isolation : A Review of the Basis**
S. Ponniah¹; V. Sourirajan¹; J. Fung¹; ¹ IRESC/IND
- P34 **Multi-objective Optimization of Power Supply System for Shipping LNG Off-loading Process Based on Switching Markov Chain and Genetic Algorithm**
R. Zhang¹; H. Tan²; ¹ University of Aberdeen/UK; ² Lloyd's Register Foundation (LRF)/UK

Poster Communications, 6-8 June 2016

- PCo1 **A discussion on the consequences of water filling of LPG storages during inspection**
F. Heymes¹; L. Aprin¹; ¹ Ecole des Mines d'Ales/F
- PCo2 **An integrated Project and Operations team – A Success Factor for a Safe Start Up**
G. Vercruyse¹; A. Pauwelyn¹; ¹ BASF SE/D
- PCo3 **Avoiding electrostatic ignition – report on advancement in German regulation**
O. Losert¹; ¹ Berufsgenossenschaft Rohstoffe und chemische Industrie/D
- PCo4 **Dispersion modeling including a statistical analysis of uncertainty**
R. Zinke¹; ¹ Otto von Guericke University/D
- PCo5 **Effect of Floor Material on Blast Overpressure in Modularized Onshore LNG Plant**
 K. Matsuzaki¹; M. Tanabe¹; ¹ JGC Corporation/J
- PCo6 **Enhancing the design of major crisis management scenario for a semi-virtual training environment**
N. Fréal¹; F. Tena-Chollet¹; S. Sauvagnargues¹; ¹ Ecole des Mines d'Ales/F
- PCo7 **Ensuring competitiveness and sustainability of innovative projects by addressing process safety issues**
J. M. Francois¹; H. Vaudrey¹; ¹ Chilworth/F
- PCo8 **European Program on Evaluation of Safety Valve Stability**
T. Dannenmaier¹; ¹ Center of Safety Excellence/D
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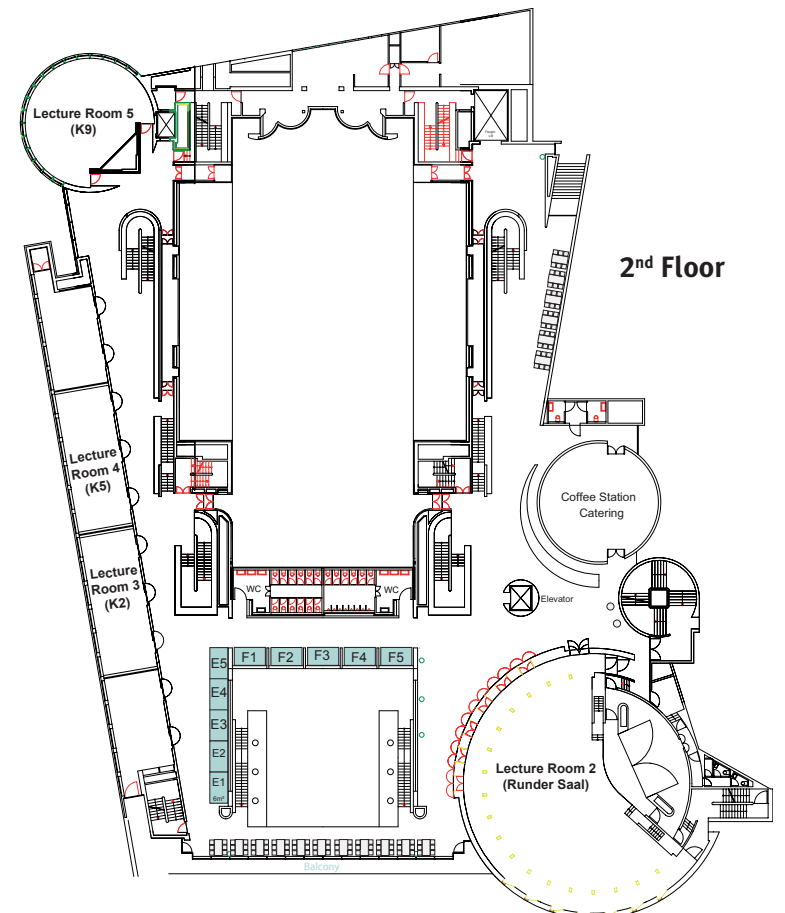
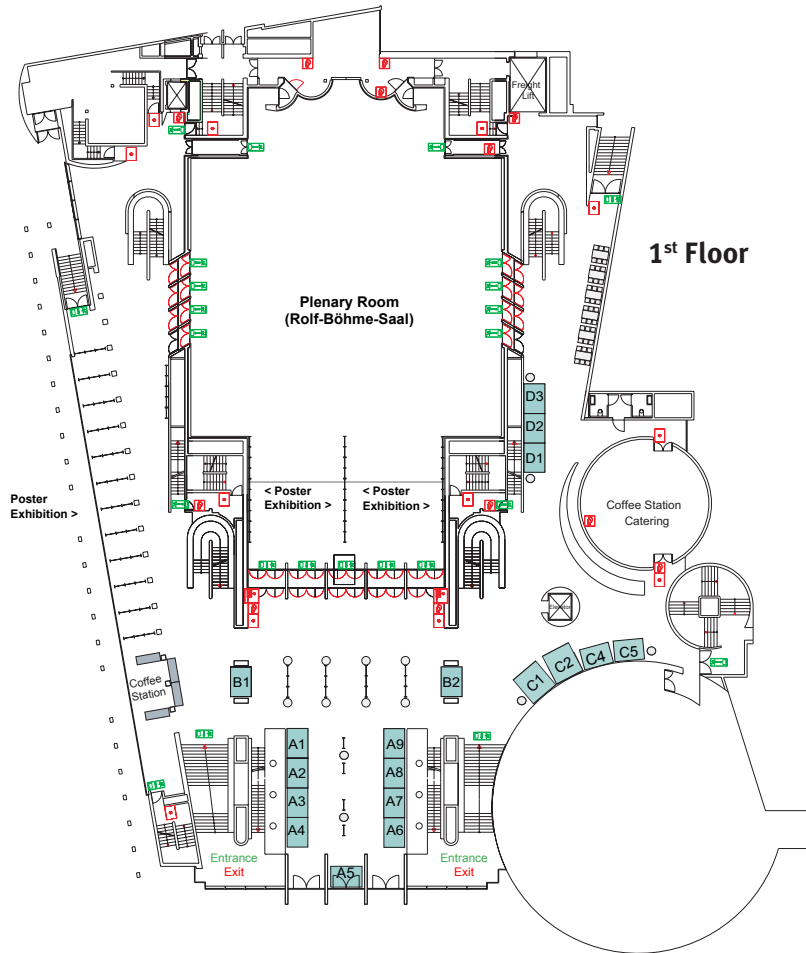
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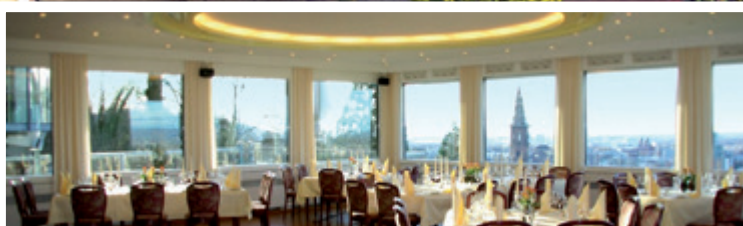
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