Programme VKI-LS

LECTURE SERIES
2012-2013

- ❒ INTRODUCTION TO MEASUREMENT TECHNIQUES
  October 8-12, 2012
- ❒ INTRODUCTION TO CFD
  January 21-25, 2013
- ❒ CUBESAT TECHNOLOGY AND APPLICATIONS
  January 29 - February 1, 2013
- ❒ CFD FOR ATMOSPHERIC FLOWS AND WIND ENGINEERING
  March 11-13, 2013
- ❒ RADIAL COMPRESSOR DESIGN
  March 11-15, 2013
- ❒ ACCURATE AND EFFICIENT AEROACOUSTIC PREDICTION APPROACHES FOR AIRFRAME NOISE
  March 25-28, 2013
- ❒ AEROENGINE DESIGN: FROM STATE OF THE ART TURBOFANS TOWARDS INNOVATIVE ARCHITECTURES
  April 9-12, 2013
- ❒ FLUID DYNAMICS ASSOCIATED TO LAUNCHER DEVELOPERS (STO-AVT-VKI-206)
  April 15-17, 2013
- ❒ RADIATION AND GAS-SURFACE INTERACTION PHENOMENA IN HIGH SPEED RE-ENTRY (STO-AVT-VKI-218)
  May 6-8, 2013
- ❒ TURBULENT COMBUSTION
  May 13-17, 2013
- ☑ SOURCE TERM CHARACTERIZATION OF THE CONSEQUENCES OF STORAGE TANK AGGRESSIONS (STO-AVT-VKI-219)
  June 4-6, 2013
- ❒ TRANSITION AND TURBULENCE IN HIGH-SPEED FLOW
  June 10-14, 2013
- ❒ FLOW CHARACTERISTICS AND PERFORMANCE OF SAFETY VALVES
  September 9-11, 2013
- ❒ ACCURATE TEMPERATURE MEASUREMENTS
  September 16-20, 2013
- ❒ 37TH COMPUTATIONAL FLUID DYNAMICS: ADJOINT METHODS IN CFD
  To be determined

THE VON KARMAN INSTITUTE

VKI is a non-profit international educational and scientific organisation, hosting three departments (aeronautics and aerospace, environmental and applied fluid dynamics, and turbomachinery & propulsion). It provides post-graduate education in fluid dynamics (research master in fluid dynamics, former "VKI Diploma Course", doctoral program, stagiaire program and lecture series) and encourages "training in research through research". The von Karman Institute undertakes and promotes research in the field of fluid dynamics.

It possesses about fifty different wind tunnels, turbomachinery and other specialized test facilities, some of which are unique or the largest in the world. Extensive research on experimental, computational and theoretical aspects of gas and liquid flows is carried out at the VKI under the direction of the faculty and research engineers, sponsored mainly by governmental and international agencies as well as industries.

The von Karman Institute organizes each year 8 to 12 one-week Lecture Series on specialized topics in the field of aerodynamics, fluid mechanics and heat transfer with application to aeronautics, space, turbomachinery, the environment and industrial fluid dynamics. These courses have gained over the years world wide recognition for their high quality which is the result of a careful choice of subjects of current interest and lecturers known for their excellency in that field and willing to co-operate in building up well-structured courses.

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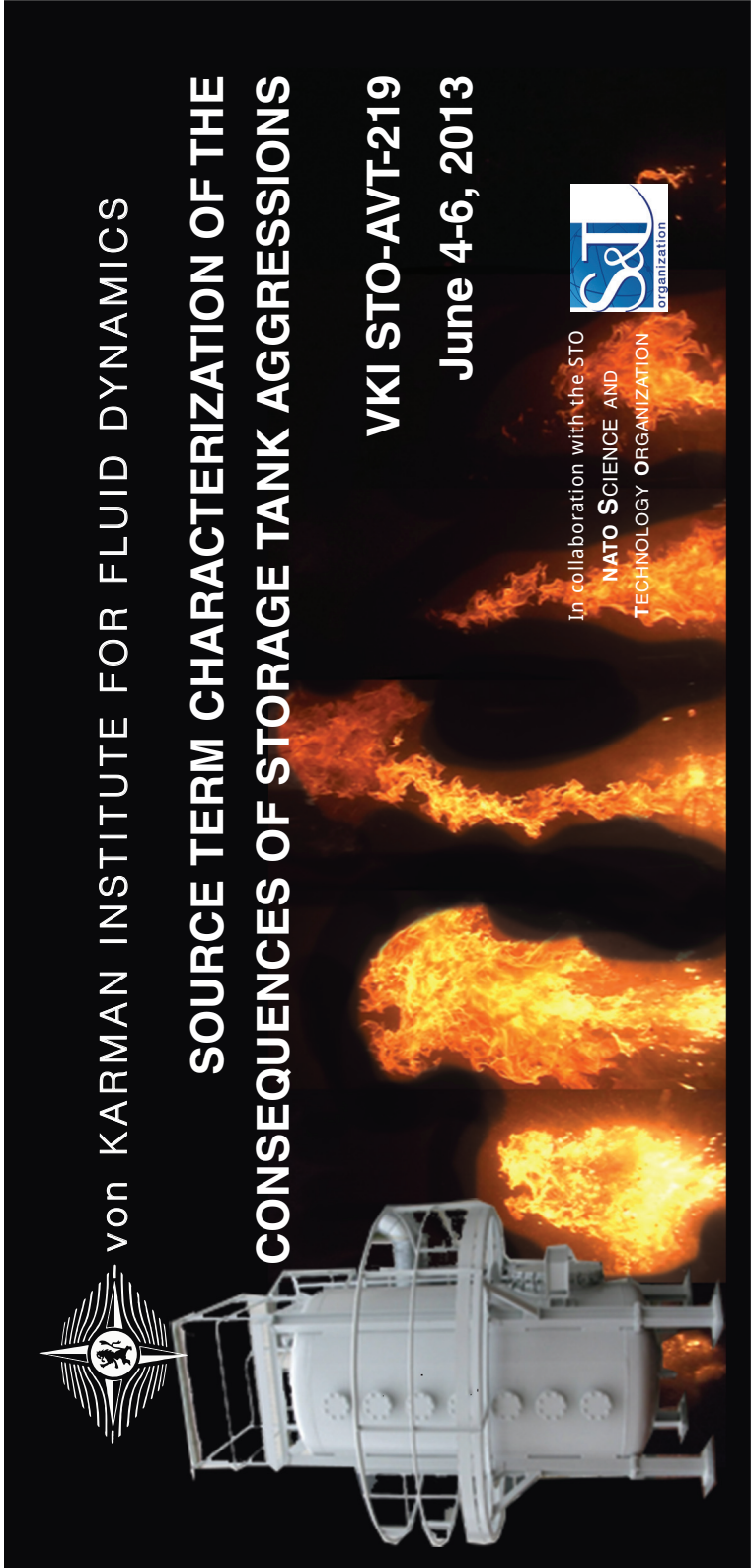
von KARMAN INSTITUTE FOR FLUID DYNAMICS

SOURCE TERM CHARACTERIZATION OF THE CONSEQUENCES OF STORAGE TANK AGGRESSIONS

VKI STO-AVT-219

June 4-6, 2013

In collaboration with the STO
NATO SCIENCE AND TECHNOLOGY ORGANIZATION



INTRODUCTION

The objective of this lecture series is to provide an up-to-date state of the art on the characterization of the source of toxic or flammable cloud resulting from diverse types of aggression of industrial units; fire, projectiles and blast impact on atmospheric or pressurized storage tanks. The final aim is to gather the skills and to promote exchanges concerning the information drawn upon industrial accidents, the experimental methods developed, the scaling adopted and the measurement techniques applied to investigate the source term, the featuring physical parameters to be studied and finally the CFD analysis performed.

VON KARMAN INSTITUTE FOR FLUID DYNAMICS

Lectures will first address individual phenomena, including experimental and modeling work, and will aim to gain a better knowledge of the state-of-the art on the following topics: Structural behavior of storage tanks, BLEVE (Boiling Liquid Expanding Vapor Explosion), VCE (Vapor Cloud Explosion), Boil-over, Jet and pool fires, Toxic release of gases and particulate matter.

Field and small-scale experiments as well as multiphase modeling of transient flows of complex topologies will be reported.

Such a short course is a unique opportunity to bring together experts from different horizons and raise fruitful discussions. The notes will provide a good basis for specialists working in the safety analysis of industrial sites as well as stakeholders.

The Lecture Series directors are Dr. Emmanuel Lapebie, CEA Gramat, France and Prof. Jean-Marie Buchlin, Head of the Environmental and Applied Fluid Department at the von Karman Institute for Fluid Dynamics.

SCHEDULE

Tuesday 4 June 2013

08:45 Registration
09:15 Welcome address
09:30 Introduction to fire, impact, explosion
Dr. Emmanuel Lapebie, CEA Gramat, France
10:45 Coffee break
11:15 Tank damage: blast/fire effects
Pr. Mike BIirk, Queen's University, Canada
12:30 Lunch
14:00 Tank damage: impact effects
Dr. Frederic Heymes, École des Mines, Albi, France
15:15 Coffee break
15:45 Recent multiphase modelling approaches to study violent events
Pr. Richard Saurel, IUSTI, Université Aix Marseille, France
17:00 Reception

Wednesday 5 June 2013

09:00 BLEVE phenomenon
Pr. Mike Birk
10:15 Coffee break
10:45 BLEVE: fireball, flashfire
Pr. Valerio Cozzani, University of Bologna , Italy
12:00 Lunch
14:00 BLEVE: blast, projectiles
Pr. Joachim Casal, Universitat Politecnica de Catalunya, Spain
15:15 Coffee break
15:45 Boilover: phenomenon, hazards , small and large scales
Dr. Delphine Laboureur, von Karman Institute, Belgium

Thursday 6 June 2013

09:00 VCE: accident investigation
Mr. Mike Johnson, GL Noble Denton Johnson, United Kingdom
10:15 Coffee break
10:45 VCE: experiments
Mr. Mike Johnson
12:00 Lunch
14:00 Domino effects: fire, impact, explosion
Pr. Joachim Casal
15:15 Coffee break
15:45 Mitigation/cost benefit
Pr. Valerio Cozzani
16:30 Fire testing
Dr. Frank Otremba, BAM, Germany
17:00 Conclusive remarks

It is highly recommended that the registration/hotel reservation form is sent at the latest 15 days before the beginning of the course. A letter of acceptance and additional information will be sent on receipt of the application form.

COURSE FEE

The course fee of 710 € includes printed notes, lunches, beverages, and administrative costs. The prices include VAT (21%). For non-Nato citizens, a request should be sent directly to STO (STO Paris, attention : Mrs. S. Cheyne – OCD Division, rue Ancelle 7, 92200 Neuilly-sur-Seine, France, or by e-mail to sandra.cheyne@cso.nato.int) at least 6 weeks prior to this course. The acceptance should then be joined to your inscription and sent to VKI.

FELLOWSHIPS

To encourage greater participation in our Lecture Series programme by university members, the Institute has established a limited number of VKI Lecture Series fellowships for citizens of NATO countries contributing to the financing of the VKI, as well as for citizens of other NATO countries coming from a university in a VKI financing country. The recipient of a fellowship is entitled to attend the VKI Lecture Series at a reduced fee, which will be 475€ (VAT included) for assistants not having a Ph.D. degree and for Ph.D. candidates, or 235€ (VAT included) for undergraduate students. The request to be considered for an award must accompany the application to attend the Lecture Series, and the applicant must provide **a recommendation letter from his or her professor**; if not done so, the request will not be taken into consideration. All possible alternative sources of funding should be investigated before aid is requested under this scheme, so that those most in need will benefit.

METHODS OF PAYMENT

Payment 2 weeks prior to the beginning of the course (name and course title clearly indicated) by bank transfer to our account Nr 210-0315330-35 at BNP Paribas Fortis Bank, avenue de la Forêt de Soignes 322, 1640 Rhode-Saint-Genèse, Belgium, IBAN BE57 2100 3153 3035 (strongly recommended). SWIFT BIC GEBABEBB. *Late registration can be paid in cash (euro), or by VISA or Eurocard at the beginning of the course.*

Lectures will be given in English and printed notes will be distributed during registration. Proceedings of non-STO lecture series may be purchased at VKI (by e-mail vanhaelen@vki.ac.be or by fax: 32 2 359 96 00).
Information can be found on http://www.vki.ac.be.

ONLINE REGISTRATION AVAILABLE
https://www.vki.ac.be/registration