Second announcement

of two Workshops organized
in the framework of the
FP7 project LIMOUSINE

Zaragoza / Spain

- WS1 -
6-7 September 2010

Thermo-acoustic instabilities in syngas combustors

Syngas fuels may become available from a number of sources, including both fossil and renewable solid fuels, and offer very interesting possibilities: valorisation of biomass or residues, CO2 reduction through H2 enrichment... The use of these alternative fuels in gas turbines is a challenging objective, due to their peculiar combustion characteristics. The risk of combustion instabilities, still a serious problem with conventional fuels, is one of the most important issues.

The workshop will aim to present current views and experience of the manufacturers and users of gas turbine engines operated on syngas. Further will be discussed the characteristics of syngas flames in combustors with relation to the coupling with acoustics. The effect of a variation of the contents of hydrogen and methane will be explored by means of available knowledge.

Preliminary programme

Monday, 15-18:30h:
- Properties of syngas fuels – J. Ballester, Univ. Zaragoza
- Fundamental aspects of hydrogen and syngas combustion – A. Sánchez, Univ. Carlos III – Madrid
- Lab-scale study of syngas flames – J. Ballester, Univ. Zaragoza

Tuesday, 9:30-13:30h:
- The flame transfer to acoustics function of a syngas flame: effect of fuel composition – J. Kok, Univ. Twente
- Transient CFD of a syngas flame: aero- and combustion dynamics – J. Kok, Univ. Twente
- Syngas combustion in a 300 MWe IGCC power plant: issues and operational experience – F. García Peña, ELCOGAS
- Visit to Unizar/LITEC combustion facilities

Tuesday, 15-17h:
- Operation of industrial gas turbine engines on syngas - ANSALDO
- Combustion dynamics in syngas fired gas turbine engines – W. Krebs, SIEMENS

Tuesday, 21h:
- Workshop dinner

- WS2 -
9-10 September 2010

Numerical analysis of acoustic phenomena in combustors

There is continuing pressure on the manufacturers of land-based gas turbines to reduce NOx further by operating in fuel lean premixed mode even closer to the lean flammability limit. However, operating in this regime can result in pressure and temperature fluctuations that can reduce the life of engine components. In recent years, this problem has been analysed using transient numerical simulations to predict the fluctuating combusting flow in the combustor and the response of the surrounding casing and components.

In this workshop, the methodology of numerical simulation of acoustic behaviour of combusting flows will be introduced. Students will have the opportunity to run their own simulations using the ANSYS software. There will also be a discussion of possible future developments.

Preliminary programme
Lecturers: Phil Stopford and others, ANSYS UK Ltd.

Thursday, 9:30-13:30h:
- Introduction to ANSYS Workbench
- Geometry building and CAD import using DesignModeler
- Meshing using the ANSYS Meshing Application
- Workshop practical example

Thursday, 15-19h:
- Introduction to fluid flow modelling
- Scale resolving turbulence models
- Turbulent combustion
- Acoustic and vibration analysis of combustors
- Workshop practical example

Thursday, 21h: Workshop dinner

Friday, 9:30-13:30h:
- Introduction to structural analysis
- Thermal and vibration analysis
- Types of dynamical analysis
- Workshop practical example

Friday, 15-19h:
- Fluid structure interaction
- 1- and 2-way coupling of pressure and temperature
- Workshop practical example

Updated info will be posted @ www.unizar.es/lci/limousine

Any researcher interested in one or both workshops is most welcome.

A fee applies to non-LIMOUSINE participants (VAT included):

	PhD students*	Other
WS1	250 €	330 €
WS2	300 €	420 €
WS1+WS2	480 €	670 €

(*) Evidence of student status may be requested

Registration (free for LIMOUSINE fellows) includes: lectures, material, refreshments, lunches and workshop dinner.

WS2 is limited by the space available in computer rooms to a maximum of 40 attendees.

Registration
- Registration form and instructions are available in www.unizar.es/lci/limousine

Accomodation

A group of rooms at special reduced rates have been blocked for participants in the workshops in Hotel Palafox (http://www.palafoxhoteles.com/?lang=GB).

Rates (including breakfast and VAT):
- Double room, single use: 65.97 €
- Double room, double use: 92.02 €

The rooms and rates are only guaranteed for reservations confirmed before August, 10.

Reservations: e-mail to reservaspalafox@palafoxhoteles.com, indicating the ref. LIMOUSINE. For reservations and other questions you can also contact Ms. Sara Barroso (Hotel Palafox), Phone +34-976 468075

Travelling to Zaragoza

Flights to Zaragoza airport exist from a few European cities (mainly with Ryanair).

Zaragoza is connected with Madrid and Barcelona by frequent high-speed trains (80-90 min. journey). More info in RENFE webpage: www.renfe.com/EN/viajeros/index.html

LIMOUSINE project (FP7, Marie Curie Actions)
(Limit cycles of thermo-acoustic oscillations in gas turbine combustors)
is a multi-disciplinary project providing research training in acoustics, combustion, mathematics, fluid and structural mechanics, experimental techniques, and control systems theory. The research objective is to predict the mechanical vibration in a gas turbine engine and the resulting fatigue and time to failure. Safe operation of the gas turbine on a variety of fuels and operating conditions is targeted. The project is motivated by the need for leaner combustion technologies and reduced emissions.

The consortium includes 14 partners: 6 European universities, 1 American university, 2 research institutes and 5 industrial companies.

http://www.utwente.nl/limousine/

Venue: The Workshops will take place at the Univ. Zaragoza
(address: Centro Politécnico Superior / María de Luna, 3 / Zaragoza / Spain)

Organized by:
Univ. of Zaragoza / LITEC
with the collaboration of Univ. of Twente and ANSYS

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