ETN NEWS

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ETN is a non-profit association bringing together the entire value chain of the gas turbine technology community in Europe. Through the co-operative efforts of our members, ETN facilitates gas turbine research and technology development, promoting environmentally friendly stationary gas turbine technology with reliable and low cost operation.

In this issue

Christer Björkqvist
Managing Director

Time to wake up!

The European energy policy is built on three pillars; sustainability, security of supply and competitiveness. All of equal importance but a lack of a balance has resulted in very high electricity prices and the European competitiveness has suffered. Between 2005 and 2012 the electricity price index for the industry in the EU has raised with 38% while it has been reduced with 4% in the US. This is not sustainable! The EU must urgently foster its competitiveness and affordable electricity prices must be the outcome of future energy and climate change policies.

Earlier this month when I participated to the ASME IGTI conference in San Antonio US, it was stated in one of the keynote speeches that "the world cannot regulate its way out of global warming, it must innovate". I could not agree more and this is true not only related to climate change but also for the competitiveness of the European industry. What worries me is that I see a different trend where R&D budgets are being cut, experienced engineers are offered early retirements and networking opportunities are being reduced as travel budgets are being decreased. This short term "turtle" behaviour can prove to be very risky and costly for the industry as well as for the whole economy. With the increasing amount of diversity in the energy mix and the uncertainties that our industry faces, both from a market and from a policy perspective, the industry should instead open up, increase its external cooperation and communicate its needs and issues.

As a result of the globalisation with the increasing spread of market demands, the complexity of the technology requirements has increased substantially. However, with increased openness, networking and collaboration at an early stage across the whole value chain we are increasing our chances to find the right solutions and enable the necessary technology developments in a competitive way. Each company should have a well-developed corporate innovation strategy based on an open and more collaborative policy that encourage and welcome external ideas. With a wider source of knowledge there is an opportunity to become competitive unpredictable.

Also universities and research institutes need to have an innovation strategy in place. I believe that there could be many opportunities for the initiation of new R&D projects in the future, both in the upcoming Horizon 2020 programme as well as through common industry funded projects. The questions the research community need to ask are: "How can we be the preferred partner of choice in a research project?" and "How can we assure a continued built up of knowledge within the university"? It is important that the R&D community communicate and demonstrate its expertise by being actively involved in networks such as ETN. You cannot have an innovation culture unless you have a networking culture.

Within ETN we have the networking culture and are now in the process of developing the right conditions and framework that will facilitate the implementation of a more open innovation culture. With our newly Project Board in place and with a more project-focused approach I believe we are on the right track.

Finally, I would like to celebrate with you that we now have more than 100 member organisations within ETN. The creation of this sound, wide and knowledgeable network is something you should all be proud of as it is your active involvement which has enabled us to pass this impressive milestone. I would encourage you to use our platform as widely as possible. We have a multitude of development opportunities ahead of us so let's explore them together in an open way.

ETN Annual General Meeting and Workshop

ETN held its Annual General Meeting (AGM) and Workshop on 16-17 April 2013 in Pisa, Italy. During the event, over 85 participants joined to discuss ETN's activities over the past year and its outlook for the future. In the afternoon of 15 April, members had the opportunity to visit ENEL's Sesta testing facilities, one of the world's most advanced experimental stations for gas turbines.

AGM

In his welcome speech, the President of the Board, Bernard Quoix of TOTAL welcomed the 8 new members who joined ETN in 2012-2013. The continuous growth of ETN shows that the network plays an important role in the whole gas turbine community.

Key topics of this year's AGM included ETN's activities report 2012-2013, the financial report, an EU energy policy update, an update on the Industrial Emissions Directive, ETN's future strategy and activities, a panel discussion on the Technological challenges and requirements for existing and next generation Gas Turbines, the ETN project Board's R&D recommendation report, Technical Committees and Project Groups progress reports, the ETN Board election and much more.

Workshop

On 17 April, the Workshop allowed the participants to attend sessions on operational flexibility & fuel flexibility, materials degradation and repair technology, asset management and condition monitoring. The sessions gave the participants the opportunity to discuss the on-going projects and potential new initiatives.

The minutes of the AGM and Workshop are available to ETN members by login in and clicking here. For more information on the event, please visit the ETN Website. ■

Member of the year

At the AGM and Workshop in Pisa, Italy, Ole Torp (Mjørud) was awarded Member of the Year for his continuous active involvement in the ETN Exhaust System Project, for his enthusiasm in involving new companies in this Project Group and for taking a leading role as acting Chairman. Congratulations! ■

ETN Annual Workshop

The next ETN Annual Workshop, kindly hosted by City University London, will take place on 9-10 October 2013 in London, UK. At the Workshop, the project leaders will report on the development of on-going projects and new initiatives since the ETN Annual General Meeting and Workshop held in April 2013. The Workshop will allow participants to progress further these projects and initiatives. Additionally, a presentation on the opportunities to propose potential projects and initiatives under the upcoming R&D funding programme Horizon 2020 will be given to the participants. The Workshop is open to ETN members only. ■

New ETN Board Members 2013-2014

Bernard Quoix
President, Total

Catherine Goy
Vice President, E.ON

Herwart Hönen
Treasurer, RWTH Aachen University

Giovanni Cerri
University Roma TRE

Uwe Kaltwasser
MTU Maintenance

Chris Lappee
Vattenfall

Gary Lock
Frazer-Nash Consultancy

Pericles Pilidis
Cranfield University

Robert Rijsdijk
Shell

Andy Williams
Wood Group

100th member to join ETN!

NEM Energy b.v., supplier of steam generating equipment for power plants and various industries, has recently become a member of the European Turbine Network.

"We wish to be part of an organisation" NEM's Vice-President of M&BD Karel van Buuren says, "that on a European level represents the interests of suppliers in the market for components of Combined Cycle Power Plants. Also we hope to open extra information channels concerning developments in the European gas turbine market and regulations affecting that market and our activities."

NEM, established in 1929, produces custom made solutions in the field of Heat Recovery Steam Generators (HRSGs), Industrial and Utility Boilers and related equipment.

NEM's HRSGs take up the largest portion of the company's activities. It has powered over 815 steam generators on six continents with a total capacity of around 35,000 MWe (which is, for example, as much as the total installed capacity of Saudi Arabia). NEM's driving forces are formed by its know-how and continuous technological innovation, with an eye for new applications. NEM products can be supplied as delivery only or on a turnkey basis.

"We hope to be able to contribute to the goals of ETN. We will actively involve ourselves in creating awareness among EU politicians regarding the positive effects that gas turbines and HRSGs could have on reaching the European climate goals in the future", added Van Buuren.

NEM's head office is in Leiden, the Netherlands. The company consists of seven business units in five different countries, which specialise in a range of specific products or focus on a distinct market region. ■

New ETN members

- National Aerospace Laboratory - NLR (The Netherlands)
- City University London (United Kingdom)
- Vokes Air (Italy)
- NEM (The Netherlands)
- OMV (Austria)

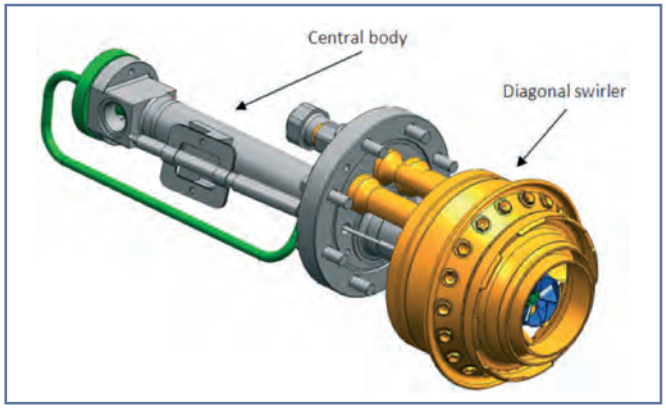
Including the latest members, ETN has now 101 members from 18 countries across Europe!

H_2-IGCC: High and full pressure tests at ENEL Sesta test rig

Following the indications resulting from the ambient and low pressure tests performed on the UniGE and GTRC test rigs, the design of the full scale burner has been completed.

On the ENEL test rig in Sesta, the most promising full scale prototype will be tested in June/July 2013 with different configurations. The design variants to be evaluated include the number of syngas premix holes in the diagonal swirler and the dimensions of the outer section of the CBO. The central body of the burner will be left unchanged during the tests.

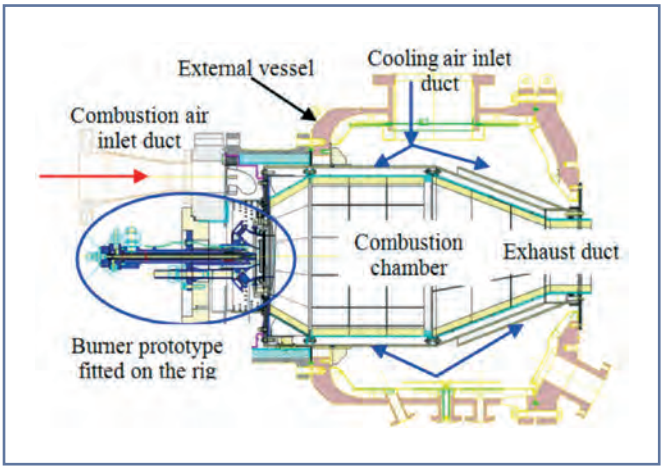
The intention is to perform the first half of the test at 8bar pressure and the second half at full GT pressure, in order to optimise the use of the fuel which is limited due to cost constraints. The fuel composition will be 85%vol of hydrogen and 15%vol of nitrogen. A baseline test with natural gas will be carried out first for each configuration.



The test procedure is expected to be to light up the burner with natural gas pilot and then change over on syngas premix operation. Part of the tests will be performed also with preheated fuel (up to 120°C).

The test points have been calculated from the gas turbine operating conditions.

In the following figure a cross section of the test rig is reported. The combustion chamber is suitable to fit one single burner prototype. The flame tube is made of three main parts: the first and the third parts are conical shaped while the second one is cylindrical. Corner shape of the combustion chamber near the outlet of the burner was optimized in order to keep the outer recirculation zone of the flame as close as possible to the GT annular chamber. The whole flame tube is lined with ceramic tiles and cooled by a dedicated, independent air flow rate. Two independent exhaust sampling lines will be used to analyze the emission content into the exhausts. A CCD camera and endoscope setup will allow video recording of the flame as seen from the burner axis.



For more information on the H_2-IGCC project, please visit www.h2-igcc.eu. ■

Oxsensis to Develop High Temperature Optical Accelerometer within EU STARGATE Project

In a Press Release published earlier this year, Oxensis announced that they would develop a new High Temperature Optical Accelerometer, under the project Sensors Towards Advanced Monitoring and Control of Gas Turbine Engines (STARGATE). The consortium of the project includes Rolls-Royce, Siemens, Oxensis (all members of ETN) and Snecma and has been awarded 5 million euro by the European Commission under the Seventh Framework Programme to develop a suite of advanced sensors, instrumentation and related systems.

Ian Macafee stated that "such instrumentation systems are necessary to facilitate the development of the next generation of green and efficient gas turbine engines. Oxensis will develop accelerometers, based around its existing Sapphire fibre optic sensing technology, for use in performance and condition monitoring in the hot core areas of aero engines and gas turbines. Oxsensis' novel technology will allow for sensors with very competitive performance specifications to be positioned in areas of the engine where it is difficult to monitor vibration reliably with traditional piezoelectric accelerometers, for the long service periods required."

For more information about this project, please click here. ■

EU news summary

EU Emissions Trading System (ETS)

On 3 July, the European Parliament voted in favor of the European Commission's proposal to postpone the auctioning of 900 million emission allowances (backloading) of the EU's Emissions Trading System (ETS) for the 2013-2020 period (third ETS trading period). This represents the second attempt to rescue the EU ETS after the European Parliament voted against the EC's proposal on 16 April 2013. The European Parliament's endorsement of the proposal gives a mandate to the text's rapporteur to begin negotiations with the Council in order to reach a first-reading agreement. ■

Future R&D Funding Programme: Horizon 2020

On 25 June, the Irish EU presidency reached an agreement with the European Parliament and the European Commission, after nine "trilogue" meetings held during the last six months. They agreed on a 70.2 billion euro budget for the next R&D funding programme, running from 2014 to 2020. The figure of 70.2 billion euro is final, although the overall EU budget still needs a final sign off by EU member states. The next step is a vote in the European parliament's Industry, Research and Energy (ITRE) Committee in July 2013. Legislative acts on Horizon 2020 should be adopted by the European Parliament and Council by the end of 2013. Horizon 2020 is set to start on 1 January 2014.

Calls for proposals under Horizon 2020

The European Research Council is planning to provide a provisional schedule for the 2014 calls late in 2013. It expects that the calls for Starting Grants will take place in the first and second quarters of 2014, the calls for Consolidator Grants will be in the second quarter of 2014 while the calls for Advanced Grants will take place in the fourth quarter of 2014. For more information, please click here.

Three pillars agreed

EU officials have agreed the percentages of three key "pillars" within the Horizon 2020 programme:

1. 'Excellent Science', which includes funding for the European Research Centre, infrastructure and future and emerging technologies, receives 37%.
2. 'Industrial Leadership', containing specific support for SMEs and for key enabling industrial technologies, receives 22.5%.
3. The third pillar - 'Societal challenges', designed to point research towards growing problems associated with an ageing society and pollution - receives 38%.

Horizon 2020 reserves 10% for energy

MEPs and member states have agreed that 10.5% of the 70.2 billion euro R&D budget will be spent on energy. EU's nuclear programme, Euratom will get 2.1 billion euro, and a further 5.2 billion euro will be reserved for other types of energy, of which 85% will be reserved for non-fossil fuel activities: renewables, end-use energy efficiency improvements, energy storage and smart grids. The remaining 15% can be spent on efficiency improvements and on projects to support fossil fuels. Horizon 2020 will fund not only research, but also market uptake projects for renewable energy and energy efficiency products, taking around 15% of the total budget (from the 85% dedicated to non-fossil fuels). ■

New ETN Membership Information Package

The new Membership Information Package is now available on the ETN website! The purpose of the package is to illustrate ETN's structure and activities and to provide concise information on the benefits of being a member of ETN.

The Membership Information Package includes the following topics:

- Who we are
- Who are ETN members
- How are we organised
- ETN technical committees
- ETN projects
- ETN events and activities
- Energy policy monitoring and technical input to the EU institutions
- ETN website and newsletters
- International cooperation
- ETN membership benefits
- How to become a member

To view and download the new Membership Information Package, please visit the ETN website.

New ETN Committee: IED Committee

By Dick Tuthill, Chairman of the ETN IED Committee, Pratt and Whitney

A stakeholder Committee was formed within ETN to address the Industrial Emissions Directive BREF as a result of the AGM in Pisa. The group includes fourteen participants equally divided between those affiliated with end users and those affiliated with gas turbine OEM's. In addition, ETN reached out to the advocacy trade group EU Turbines to coordinate our advocacy. Of primary concern is the definition of Best Available Technologies (BAT's) to achieve NOX emissions less that 50 mg/Nm^3 whilst operating on liquid fuel.

After a number of meetings and a wide exchange of views, the stakeholder group recommended relevant language to the Institute for Pollution Prevention and Control (IPPC, Seville) to update the BREF from the 2006 version. In particular, we concluded that no fully deployed and validated technologies exist to meet the NOX level required on liquid fuel.

Three technologies to meet this requirement are rapidly emerging however: extension of water/steam injection to higher diluent to fuel ratios; partial premixing/prevaporization with or without diluent injection; and Dry Low NOX.

The Committee also received input from the Electric Power Research Institute (who are also members of ETN) that indicated, based on US experience, Selective Catalytic Reduction (SCR) is not feasible for long term liquid fired use due to ammonium bisulfate formation issues. Additionally, deployment of SCR for installation in which liquid fuel is only used as a back-up is not economically reasonable considering the limited hours of operation and the total mass of NOX emissions reduced. ■

ETN ARTICLE IN POWER ENGINEERING INTERNATIONAL

Christer Björkqvist, Managing Director of ETN, has been invited to write an article in the **Power Engineering International Magazine**. The article has been published in the Guest editorial section of the PEI Magazine in April 2013. In the same edition, John Oakey, Professor of Energy Technology at Cranfield University has been providing input on an article on advanced gas turbine materials titled *"Part genius, part trial and error"* (page 4). A Gas and Steam Turbine Directory is also available (pages 20-40). To view the article, please click here. To view the complete edition of the PEI Magazine, please click here. ■

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