

MINUTES OF THE PROJECT BOARD MEETING BRUSSELS, BELGIUM, 24 JANUARY 2013

Present:

Sauro Pasini	Enel
André Zeijseink	-
Peter Breuhaus	International Research Institute Stavanger
Peter Jansohn	Paul Scherrer Institute
Naser Sayma	City University London
Heikki Olteidal	Statoil
Christer Björkqvist	ETN
Karen Geris	ETN

Apologies:

Franco Rosatelli	EUTurbines/Ansaldo Energia
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Agenda:

1. Welcome And Approval of Minutes of the Malmö meeting
2. Terms of Reference
3. Evaluation and outcome of the International Gas Turbine Conference 2012 & High Level User meeting-R&D recommendations
4. Horizon 2020 programme status and ETN lobbying activities
5. Cooperation with other organisations/events and way forward
6. Topics to propose to the EC based on interest of the industry stakeholder's – GT users and OEM's.
7. ETN activities in 2013
8. Restructuring of ETN Technology Committees
9. R&D recommendation report for AGM

1. Welcome and Approval of Minutes of the Malmö Meeting

Peter Jansohn opened the meeting and welcomed the Project Board members.

Christer Björkqvist relayed the apologies of Franco Rosatelli, who unfortunately had to cancel his travel plans. However, EUTurbines would like to enforce cooperation with ETN, especially when it comes to project development and lobbying for funding opportunities for the upcoming Horizon 2020 programme. C. Björkqvist reported that EUTurbines are in the process of identifying projects where the OEMs would be prepared to come up with the required co-funding. Further, C Björkqvist forwarded the message to the group that EUTurbines welcome that ETN would do the coordination of those projects.

The minutes of the previous meeting were approved. Heikki Oltedal suggested to send project board members regular reminders for any outstanding action points.

Action: ETN to remind Project Board members of their actions at regular intervals.

2. Terms of Reference

Christer Björkqvist presented a draft Terms of Reference document which outlines the details of the operation of the Project Board. During the meeting, the project board reviewed discussed and adapted the articles.

All the comments and revisions were implemented in the final draft of the Terms of Reference, which can be found in the Annex of these minutes. This draft will be send to the ETN Board for final approval and implementation

Action: ETN to implement the discussed changes in the Terms of Reference and send the final draft to the Project Board members by 8 February 2013.

Action: ETN to send the draft to the ETN Board for final approval and implementation at the upcoming board meeting.

3. Evaluation and outcome of the International Gas Turbine Conference 2012 & High Level User meeting-R&D recommendations and

4. Horizon 2020 Programme and ETN lobbying Activities

Christer Björkqvist presented the results of the International Gas Turbine Conference 2012, the High Level User meeting, Horizon 2020 and gave an update on ETN's lobbying activities. The presentation can be found [here](#).

Andre Zeijseink and Sauro Pasini commented that operational flexibility is also a short term priority as the load profile of a lot of existing plants has to change to compensate for the intermittency of wind and solar power. One priority would thus be to find retrofit solutions for existing machines to deal with RES intermittency.

Heikki Oltedal remarked that a slide with future demands from the Oil & Gas sector was missing and offered to provide input for this before 1 February 2013.

Andre Zeijseink also stated that the trend towards CCS is negative as CCS is designed for base-load plants and the European market trend is today going towards flexible load-following plants. One solution, which was proposed, could be to operate hydrogen fuelled plants without CCS to increase the flexibility. Peter Jansohn commented that you would then either need a non-carbon

hydrogen source or you would still need CCS. However, with hydrogen there would also be the issue of storage, as it would be very difficult to store in a safe way the large amounts of hydrogen needed to fuel a power plant in a safe way. Peter Jansohn suggested that a solution could be to decouple the gasification process from the CCS process.

Action: Heikki Oltedal to specify the priorities for Oil & Gas operators by 1 February 2013.

5. Cooperation with other organisations/events and way forward

6. Topics to propose to the EC based on interest of the industry stakeholder's – GT users and OEM's.

Christer Bjorkqvist reported that ETN, since the IGTC-12 conference, has been in close contact with the **International Energy Agency (IEA)**. ETN has recently been invited to review a gas chapter in IEA's yearly Clean Energy Progress Tracking report. C. Bjorkqvist proposed to forward the chapter to the project board members to receive input where necessary. Christer Bjorkqvist has also been invited to meet with the IEA in Paris to discuss further cooperation.

ETN and **EUTurbines** are in the process of signing a Memorandum of Understanding to clarify future cooperation between the two organisations. The idea is to continue the cooperation with regards to lobbying for R&D opportunities in the Horizon 2020 programme and propose a joint input for topics in future Horizon 2020 calls, based on the proposed projects where the industry is prepared to come up with the required co-funding. This text should be ready to send to the contacts at the European Commission by Mid-March.

Christer Bjorkqvist reported that EUTurbines members suggested proposing projects in the following main categories:

1. Fuel flexibility (combustion)
2. Material Development and improvement to enable increased temperatures
3. Instrumentation and Condition Monitoring to enable increased operational flexibility

Peter Jansohn remarked that the Project Board should not limit their suggestions only to potential projects under the Horizon 2020 programme as not all important topics would fit in the Horizon 2020 framework. Also other funding opportunities such as national funding or industry funded projects should be considered.

The ETN Project Board made a similar list based on previous ETN projects, possible new ETN Projects and the Roadmap for Turbomachinery, which was published by EUTurbines.

1. Fuel and Operational Flexibility (combustion instability, condition monitoring)
2. (CSP) Hybridisation
3. Gas turbine with CCS for flexible operation
4. Hot Temperature Operation (materials, coatings, cooling)

The following way forward was proposed by Christer Bjorkqvist:

1. ETNs Project Board propose a list of key R&D topics;
2. ETN compares our list and topics with EUTurbines and agree on a final list of R&D topics
3. Creation of a justification document that backs up our proposed R&D areas as a follow up to our past joint position paper
4. Set up of personal meeting with selected contacts at DG Energy and DG Research to deliver and present the paper.

The Project Board agreed to the proposed way forward.

Action: Christer Bjorkqvist to forward the IEA chapter to the Project Board for review.

Action: Christer Bjorkqvist to discuss the input from the ETN Project Board with Franco Rosatelli after the Project Board meeting.

Action: Christer Bjorkqvist to arrange for a meeting between EUTurbines and ETN to discuss and agree on the final proposal to be sent to the EC.

7. ETN activities in 2013

a) Update on on-going projects and activities

The Project Board discussed the current on-going projects and assigned one or two Project Board members per initiative, who would monitor the progress of each project. This should also facilitate the compilation of the yearly R&D recommendation report.

Exhaust Systems Project – Heikki Oltedal

Karen Geris gave a short overview of the current status of the Exhaust Systems Standard and the CFD Benchmark Case. The Project Group members would like to see additional involvement from Oil & Gas users.

Action: Karen Geris to contact more Oil & Gas users (British Gas, BP, ENI, Neste Oil etc.) to join the ETN Exhaust Systems Project group.

Action: Andre Zeijseink to put Karen Geris in contact with colleagues that have experience with ISO standards.

TopCycle Feasibility Study – Peter Breuhaus

Christer Björkqvist gave a short overview of the current status of the TopCycle Project. Alstom is very interested in partaking in the feasibility study though they would rather see an integrated approach – where the TopCycle unit would be integrated in the overall GT- than the parallel approach which is suggested by Euroturbine, who had designed the TopCycle as a “retrofit” to an existing engine. The project participants have thus decided to investigate both options in the initial phase; Alstom is currently making a list of issues which should be investigated during this initial phase in order to make a decision for the following phase which would be the solution to investigate.

OMSOP – Naser Sayma

Naser Sayma reported that since the last Project Board meeting, the European Commission has invited the OMSoP consortium for contract negotiation. The negotiation process has now been finalised and the European Commission is expected to sign the contract before 1 February 2013, which would be the starting date of the project. The kick-off meeting is preliminary planned to take place 17-18 February in Rome, Italy. ETN would be responsible for the dissemination of the results.

HYCOSOL – Peter Jansohn

The HYCOSOL project is currently still on the EC waiting list and Christer Bjorkqvist reported that he believed that the chance it will be funded within FP7 programme is very low. Andre Zeijseink suggested to check with [Desertec](#), which promotes the use of solar energy in desert areas, if this programme could provide a funding opportunity.

Action: Andre Zeijseink to check with Desertec if funding would be available

Combustion Instabilities – Peter Jansohn

The Project Board agreed that this paper would not be suitable to send to the European Commission. It could be published as a technical paper within the ETN framework but then it would need to be rewritten. Peter Jansohn would follow up with Eugenio Giacomazzi to relay the recommendations from the Project Board and guide the process of rewriting the paper.

Action: Peter Jansohn to contact Eugenio Giacomazzi to discuss the redrafting of the Combustion Instabilities paper.

CFD Validation Study – Naser Sayma

Karen Geris reported that the group would need experimental data to do the validation but this is often proprietary data. Naser Sayma commented that there are several specialised institutions that would be more suited for this kind of work.

The Project Board agreed though that it could be interesting to publish the CFD capabilities of ETN Members on the website. There would be room for this under organisation profiles in the Members Directory, which is accessible by ETN members in the member's area. ETN could also encourage ETN members to include links to public reports which show their capabilities in CFD, or any other field to increase the credibility.

Action: ETN to request ETN Members to complete their online organisation profile and clearly show their capabilities by including links to public reports by 15 February 2013.

Action: ETN to confirm with the web administrator the possibility to include a search function of keywords for the organisation profiles

Virtual Testing Project- Naser Sayma

Naser Sayma gave a short overview of the current status of the Virtual Testing Project. The Project Board agreed that the project could not be funded as a stand-alone project but it could fit well as part of a wider project that aims to increase flexible operation.

The Project Board also stated that it would be interesting to do a literature review but this would require a small budget. Christer Bjorkqvist confirmed that ETN has a small budget for these kinds of expenses. In order to be eligible for this, the project partners should make a clear project outline, including an overview and justification for the requested budget. The Project Board would then review the request and if positively evaluated, the project could receive funding for its activities. Naser Sayma agreed to write a student project work plan cost justification.

Action: Naser Sayma to write a student project work plan and cost justification.

Industrial Emissions Directive

Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) brings together Directive 2008/1/EC (the 'IPPC Directive') and six other directives in a single directive on industrial emissions. The objective is to avoid or minimise polluting emissions in the atmosphere, water and soil, as well as waste from industrial and agricultural installations, with the aim of achieving a high level of environmental and health protection. The permit conditions including emission limit values (ELVs) must be based on the Best Available Techniques (BAT), as defined in the IPPC Directive. BAT conclusions (documents containing information on the emission levels associated with the best available techniques) shall be the reference for setting permit conditions. To assist the licensing authorities and companies to determine BAT, the Commission organises an exchange of information between experts from the EU Member States, industry and environmental organisations. ETN is part of a working group which gives input into the Industrial Emissions Directive.

The work is co-ordinated by the European IPPC Bureau of the Institute for Prospective Technology Studies at the EU Joint Research Centre in Seville (Spain). This results in the adoption and publication by the Commission of the BAT conclusions and BAT Reference Documents (the so-called BREFs).

Heikki Oltedal stated that there are GT that have very low NO_x emissions but then the CO₂ exhaust is 10% higher.

Christer Björkqvist agreed to send the working groups letter of input to the Project Board.

Action: Christer Björkqvist to send the IED input document to the Project Board.

Shale Gas Study, EU gas Harmonization – Sauro Pasini and Andre Zeijseink

The Shale Gas Study was a student project, initiated by an ETN user but performed at Cardiff University. The project report is currently under review by the University of Cardiff after which it will be sent to ETN. Andre Zeijseink offered to review the report before it would be published on the ETN website.

The EU Gas Harmonization Project was initiated by the European Commission (EC) after ETN sent a Position Paper to the EC. The delivery of the final report of the study, performed by GL and Pöyry is currently delayed by more than one year. It was agreed that Karen Geris should monitor the EC website to find out when the report is published or expected to be published.

Action: Karen Geris to send Andre Zeijseink the Shale Gas Study report

Action: Andre Zeijseink to review the Shale gas Study report

Action: Karen Geris to monitor results from the gas Harmonisation Project.

Advanced Sensor Technologies for GT – Sauro Pasini

Karen Geris reported that the Project is meant as an education project for the Users so they can build up their knowledge, independent of OEMs and suppliers.

Ian McAfee (Oxsensis) had sent some suggestions for involvement in ETN projects to Christer Bjorkqvist. Sauro Pasini would be interested in cooperating with Oxsensis on the issue of field experience on the life of the sensor, as they have a lot of experience in that field, however he would need to receive more specific questions. Andre Zeijseink stated that there would also be a lot of opportunity for sensors in the nuclear industry.

Action: Christer Bjorkqvist to contact Ian McAfee to generate more specific questions to send to Sauro Pasini.

Filtration Project – Andre Zeijseink

Andre Zeijseink confirmed that the major issue with regard to the choice of filters is that the users are not aware of the influence of the filters on the plant output. DNV KEMA has performed a study a couple of years ago which showed that fouling could cause a loss in plant output of multiple MWh. One should try to give a relation between the revenue of the increased performance of the GT on one side, and the cost of maintenance and replacement of the filters, washing systems and slippery coatings, he proposed. The Project Board discussed the possibility to perform a literature research which could show the influence of compressor fouling on plant operation. It was agreed that Andre Zeijseink should review the Filtration Paper and formulate recommendations for the next steps for the Filtration Project – this would most likely be a best practice guideline. He also offered to give a presentation at the upcoming AGM and Workshop to present the most important findings of the KEMA study.

Action: Karen Geris to send the Filtration Paper to Andre Zeijseink by 8 February 2013

Action: Andre Zeijseink to review the Filtration Paper and formulate recommendations by 30 March 2013

Action: ETN to confirm with Andre the possibility to give a presentation at the upcoming AGM and Workshop.

Thermal Barrier Coating Study- Heikki Oltedal

The Thermal Barrier Coating Project aims to educate users on the topic of Thermal Barrier Coatings. The Project Board acknowledges this is an important issue but difficult as a lot of the data on coatings are considered proprietary data by the OEMs. The Project Board agreed that the group should continue its work as proposed by setting up an inventory with the most important TBC literature.

Hot Borescoping Project – Peter Breuhaus and Sauro Pasini

The progress in this project group is being slowed down by the fact that there is currently no OEM actively involved. Christer Bjorkqvist reported that Alstom had shown interest but so far no further reaction had taken place. Peter Breuhaus, who knows the person within Alstom responsible for Robotics, offered to contact him directly. Sauro Pasini stated that Ansaldo has also worked on this issue and he would ask Franco Rosatelli if he would be interested in joining the project.

Action: Peter Breuhaus to contact Alstom to discuss their possible involvement in the Hot Borescoping Project.

Action: Sauro Pasini to contact Franco Rosatelli to discuss Ansaldo's possible involvement in the Hot Borescoping Project.

LLM Database

The Project Board suggested freezing the initiative until there is more interest from the Users.

Creep-Fatigue Database

The Project Board suggested stopping the initiative until there is more interest from ETN Members. The data needed for the project is often proprietary data from the OEMs.

Risk Based Decision Making – Peter Breuhaus

A student from Cranfield University has performed a literature review on the topic of Risk Based Decision Making. Peter Breuhaus would review the report before it can be published on the ETN website.

Action: Karen Geris to send the final report to Peter Breuhaus for review.

Condition Monitoring

The list of topics should be discussed once more at the upcoming AGM and Workshop to identify 4-5 very interesting topics and focus on them by adding them to a timeline to launch the initiative and create some momentum. If there is not sufficient interest, the Project Board suggested freezing the initiative until there is more interest from ETN Members.

Action: Karen Geris to communicate the recommendations of the Project Board to Pascal Decoussemaeker and to include the topic in the agenda at the upcoming Workshop.

8. Restructuring of ETN Technical Committees

Christer Bjorkqvist reported that it had been proposed at the High Level User meeting in October 2012 to review the titles and objectives of the Technical Committees. The Project Board discussed this and proposed to change the set-up of the technical committees as follows:

TC1: Operational Flexibility

TC2: Fuel Flexibility

TC3: Materials Degradation and Repair Technologies

TC4: Asset management and condition monitoring

Given that there a lot of common topics within TC4 and TC5, the Project Board proposed to merge both TC's. It was agreed that this would most likely lead to an increased participation and interest in the topics discussed in what was previously TC5.

9. R&D recommendation report for AGM

The Project Board decided that the yearly report should be published one month before each AGM; for this year, the deadline would be 15 March 2013.

Peter Jansohn proposed to write an outline and send it to the other Project Board members by 15 February 2013 after which it will be discussed in a teleconference. Each Project Board member will contribute to the report by writing certain sections. The report should be no longer than 5-10 pages.

Action: Peter Jansohn to compile outline of the yearly R&D recommendation report and send it to the Project Board by 15 February.

Action: Karen Geris to set up a teleconference to discuss the outline of the yearly R&D recommendation report.

10. Closing of the meeting

Peter Jansohn closed the ETN Project Board and thanked the Project Board members for their valuable input.

The next Project Board meeting is scheduled to take place at the end of June or the beginning of July. ETN should send around a doodle to identify the date which is most suitable to hold the meeting.

Action: Karen Geris to send around a doodle to identify the date which is most suitable to hold the meeting.

ACTION LIST

No	Responsible	Action	Deadline
1.	ETN	Remind Project Board members of their actions at regular intervals.	On-going
2.	ETN	Implement the discussed changes in the Terms of Reference and send the final draft to the Project Board members	8 February 2013
3.	ETN	Send the draft to the ETN Board for final approval and implementation at the upcoming board meeting.	
4.	Heikki Oltedal	Specify the priorities for Oil & Gas operators	15 February 2013
5.	Christer Bjorkqvist	Forward the IEA chapter to the Project Board for review.	Upon receipt
6.	Christer Bjorkqvist	Discuss the input from the ETN Project Board with Franco Rosatelli after the Project Board meeting.	24 January 2013
7.	Christer Bjorkqvist	Arrange a meeting between EUTurbines and ETN to discuss and agree on the final proposal to be sent to the EC	
8.	Karen Geris	Contact more Oil & Gas users (British Gas, BP, etc.) to join the ETN Exhaust Systems Project group.	On-going
9.	Andre Zeijseink	Put Karen Geris in contact with colleagues that have experience with ISO standards.	15 February 2013
10.	Andre Zeijseink	Check with Desertec if funding would be available for the HYCOSOL Project	15 February 2013
11.	Peter Jansohn	Contact Eugenio Giacomazzi to discuss the redrafting of the Combustion Instabilities paper.	15 February 2013
12.	ETN	Request ETN Members to complete their online company profile and clearly show their capabilities by linking to public reports	15 February 2013
13.	ETN	confirm with the web administrator the possibility to include a search function of keywords for the organisation profiles	1 February 2013
14.	Naser Sayma	Write a student project work plan and cost justification for the Virtual Testing student project	15 February 2013
15.	Christer Bjorkqvist	Send the IED input document to the Project Board.	8 February 2013
16.	Karen Geris	Send Andre Zeijseink the Shale Gas Study report	15 February 2013
17.	Andre Zeijseink	Review the Shale Gas Study report	15 March 2013
18.	Karen Geris	Monitor results from the gas Harmonisation Project	Continuing
19.	Christer Bjorkqvist	Contact Ian McAfee to generate more specific questions to send to Sauro Pasini.	8 February 2013
20.	Karen Geris	Send the Filtration Paper to Andre Zeijseink	8 February 2013
21.	Andre Zeijseink	Review the Filtration Paper	30 March 2013
22.	ETN	Confirm with Andre the possibility to give a presentation at the upcoming AGM and Workshop.	15 March 2013
23.	Peter Breuhaus	Contact Alstom to discuss their possible involvement in the Hot Borescoping Project.	15 February 2013
24.	Sauro Pasini	Contact Franco Rosatelli to discuss Ansaldo's possible involvement in the Hot Borescoping Project.	15 February 2013

25.	Karen Geris	Send the final report of the Risk-Based Decision Making Study to Peter Breuhaus for review.	Upon receipt
26.	Karen Geris	Communicate the recommendations for the Condition Monitoring Project of the Project Board to Pascal Decoussemaeker and to include the topic in the agenda at the upcoming Workshop.	15 February 2013
27.	Peter Jansohn	Compile outline of the yearly R&D recommendation report and send it to the Project Board	15 February 2013
28.	Karen Geris	Set up a teleconference to discuss the outline of the yearly R&D recommendation report.	TBD
29.	Karen Geris	Send around a doodle to identify the date which is most suitable to hold the meeting.	15 February 2013