

MINUTES OF IIT-EU WORKSHOPS ON *TECHNICAL EDUCATION IN INDIA*,  
India Forum, Halle 6, Hannover Messe, 28 April 2006

AGENDA

Welcome Speeches:

Convenor / Mr. Vidya Kaushik, IMEC, Belgium / [kaushik@imec.be](mailto:kaushik@imec.be)  
President / Mr. Sharad Tripathi, FLUIDYN, France / [sharad.tripathi@fluidyn.com](mailto:sharad.tripathi@fluidyn.com)  
Representative of Ministry of Commerce , India / Ms. Asha Swarup (Additional Secretary)

**WORKSHOP 1 (Infrastructure & Environment)**

Moderator / Mr. M. Chandramouli, SURYA International, Belgium / [chandra@skynet.be](mailto:chandra@skynet.be)

Panellists:

Prof. Philippe Bisch, ENPC, France / [philippe.bisch@sechaud.fr](mailto:philippe.bisch@sechaud.fr)  
Prof. Juergen Gueldenpfennig, RWTH Aachen, Germany / [jg@lmbau.rwth-aachen.de](mailto:jg@lmbau.rwth-aachen.de)  
Prof. Gérard Carnat, INT-Evry, France / [gerard.carnat@int-evry.fr](mailto:gerard.carnat@int-evry.fr)  
Prof. Burghard Mueller, FH Aachen, Germany / [burghard.mueller@fh-aachen.de](mailto:burghard.mueller@fh-aachen.de)

**WORKSHOP 2 (Process & Manufacturing)**

Moderator / Mr. Satish Pai, Schlumberger, France / [spai@paris.oilfield.slb.com](mailto:spai@paris.oilfield.slb.com)

Panellists:

Dr. Thomas Jordan, IKET-FZK, Germany / [Thomas.Jordan@iket.fzk.de](mailto:Thomas.Jordan@iket.fzk.de)  
Prof. Pierre Becker / Dr. Sébastien Ducruix, ECP, France / [sebastien.ducruix@ecp.fr](mailto:sebastien.ducruix@ecp.fr)  
Prof. Sanjay Dhande, IIT Kanpur, India / [sgd@iitk.ac.in](mailto:sgd@iitk.ac.in)  
Dr. Olaf Winkler, RWTH Aachen, Germany / [winkler@iht.rwth-aachen.de](mailto:winkler@iht.rwth-aachen.de)

**WORKSHOP 3 (Technical Exchange Programmes)**

Moderator / Mr. Sharad Tripathi, FLUIDYN, France / [sharad.tripathi@fluidyn.com](mailto:sharad.tripathi@fluidyn.com)

Panelists:

Prof. Daniel Grimm, ECP, France / [daniel.grimm@ecp.fr](mailto:daniel.grimm@ecp.fr)  
Dr. Heinz Nastansky, DAAD, Germany / [Nastansky@daad.de](mailto:Nastansky@daad.de)  
Mr. H. Chatterjee, AK Nord-Sued, RWTH Aachen, Germany / [hinchatterjee@yahoo.com](mailto:hinchatterjee@yahoo.com)  
Mr. Shyamal Desai, DAMSK, UK / [shyamal.desai@damsk.com](mailto:shyamal.desai@damsk.com)  
Prof. Hervé Biauxser, ECP, France / [hervé.biauxser@ecp.fr](mailto:hervé.biauxser@ecp.fr)  
Mr. Ashank Desai, MASTEK, India / [ashankd@mastek.com](mailto:ashankd@mastek.com)

## **WELCOME SPEECHES**

Mr. Kaushik opens the conference and gives a short overview of the Alumni Association IIT-EU founded in August 2005 in France to facilitate technical and educational interaction between the EU and India.

Mr. Tripathi describes the objectives of IIT-EU, emphasizing the European dimension, and calls for 'investing in educating India'.

The representative of MoC describes, among others, the economic growth potential of India, the advantages of Indian institutes for research, the need for development and transformation, the resources available, current economic aspects, the role of international dialog in correcting misconceptions, and calls for EU faculty to consider working in India.

## **WORKSHOP 1 (Infrastructure & Environment)**

Prof. Bisch describes several typical projects in the area of civil engineering of nuclear power plants and related facilities, such as dynamic structural response to loads due to postulated aircraft crash and earthquakes for the EPR, mentions work on the ITER, and also on upgrading existing plants. Other activities cover benchmarking, vibration tests, and demolition investigations. He stresses the importance of advanced and continuing education for engineers, including the role of simplified methods of analysis.

Prof. Gueldenpfennig stresses the special need for foreign students to rely upon themselves to manage their academic work programmes in order to succeed in the German system of university education in which students enjoy considerable freedom. He then lists certain concerns, such as declining Indo-German academic contacts and cooperation, and employment opportunities for graduates. Civil engineering infrastructure quality (durability) improvements remain an important goal for India that could be pursued in future Indo-European cooperation projects.

Prof. Carnat presents a detailed overview of the French advanced educational system for engineers interested in a career as a decision-maker in complex state and commercial organisations. Adequate preparation and careful selection of candidates are important. The goal is to produce highly adaptable "change makers" in a constantly changing world. Early networking with industry and within alumni associations is an additional advantage for graduates. Various ministries supervise many such educational institutions historically grown in number to meet the demand for engineers in specific sectors.

Prof. Mueller reports on courses, partly held in English, offered to foreign students. Cooperation with IIT Chennai (Madras), Bachelor courses offered in cooperation with the TU Eindhoven (NL), and a growing emphasis put on a renewable energy programme are some examples of activities that also include counselling students who graduate in Germany.

During the discussion period after the presentations of the panelists, following topics were mentioned.

Responsibility of professors in making courses attractive for students to attend.

A current international project on seismic engineering (USNRC) and the environmental engineering programme at IIT Kanpur.

The need for innovation, for more internships etc.

The evolution of the French system and its relevance for India.

The emphasis put upon abstract, analytical thinking in France in educating future managers with an engineering background.

The Indian approach of educating engineers first, before an engineering or management career is followed by graduates.

## **WORKSHOP 2 (Process & Manufacturing)**

Dr. Jordan gave a detailed technical overview of hydrogen safety management R&D at IKET-FZK. The radiolytic gas control project in nuclear power plants has expanded into a longer range hydrogen safety programme. Experiments to investigate related transition phenomena, including detonation physics codes and plant applications were mentioned. Research as well as certification (licensing) support tasks and international activities have led to the formation of the EU consortium 'HySafe' in March 2004 (described under: [www.hysafe.net](http://www.hysafe.net)) that represents an attempt at integrating all European research for the safety of hydrogen as an energy carrier. The related clusters and work packages include educational as well as regulatory activities. As an example, the simulation of a combustible cloud release inside a road tunnel was shown. The need for continued research to understand transitional phenomena in combustion processes (Deflagration/Detonation) has been underlined. On the basis of a current EC call, other interested parties from INCO countries (such as India, Russia etc.) may apply for participation in HySafe until May 2006. A call was made for participating in the upcoming conference ICHS in San Sebastian during 11-13.09.2007 (see: <http://conference.ing.unipi.it/ichs2007/>).

Dr. Ducruix summarised some cooperation programmes of the ECP within Europe in the framework of the T.I.M.E. Network and, more recently, with Brazil and China. This is part of the ECP International Network (described under: [www.ecp.fr](http://www.ecp.fr)). Emphasis was put upon the similarities between the curriculum of French 'Grandes Écoles' and, particularly, of the cluster of Écoles Centrales and Indian Institutes of Technology. Various graduate levels oriented towards relevance for industrial applications and innovation are offered. ECP laboratories and their major fields were then briefly described. Under the EU FP7, an EU-India cooperation programme is in development. Combustion engineering research would be the selected topic since advanced work in this area is already performed at the ECP. Examples of complex flows in gas turbines simulated with the help of parallel supercomputers using very large models and large-eddy simulation (LES) were shown. The goal is to develop efficient and stable processes with low emissions. Collaboration projects with research institutes and companies were also mentioned.

Prof. Dhande spoke on behalf of all IITs to present a detailed view of current perspectives for Indo-European cooperation based on information gathered from France and Germany. Among other topics, the “Winter Academy” programme allows undergraduates to participate in research tasks (e. g. sponsored by Tata Steel). Under the “Joint Academic Programme” (e. g. IIT / Singapore), such actions as: team formation, investing in infrastructure of mutual interest, and cooperation with European industry in India (e. g. Siemens) are planned with the RWTH Aachen. Under the “Frontiers of Engineering” programme, he stressed the need for focusing on: government programmes, distance education at high-end of research, and bilateral Germany-India brainstorming. A call for EU faculty to consider working in India was issued, mentioning various contractual alternatives (3 to 5 years) that are possible and such practical considerations as living quarters that are available. Continued interest in the fate of EU IIT students was expressed. Regarding Indian students in Germany, the Humboldt programme was praised. The DAAD programme selection procedure and the lack of an agenda for the students require improvements. Under the concept of “Joint Technical Development”, a programme leading to “prototypes” should be strived for, exploiting synergies between Europe and India. A call for a “new order”, based on deepening mutual cultural knowledge, concluded the talk.

Dr. Winkler presented an overview of the research in the area of microelectronics conducted at the IHT-RWTH Aachen. Nanotechnology and Optoelectronics are the two main activities that concern manufacturing techniques, applications, and devices, such as solar cells, memories, laser development, imaging, spectroscopy, bioanalytics, and optical data storage. Past cooperation programmes with industry and within the EU should be extended towards future projects with IITs.

In the discussion period after the presentations of the panelists, following topics were mentioned.

Offering working opportunities in India to EU faculty during their sabbaticals.

Specific contractual arrangements, including Adjunct Professor status for research professors.

The need for a longer range partnership between EU and Indian universities.

Strengthening the role of individual professors on both sides in deciding upon thesis subject and candidate selection.

Development work of major importance needed for improving operation and maintenance of the Indian railroad system.

The need for an incremental approach to cooperation.

Trends in research funding levels and importance of the EU FP7.

The role of hydrogen in the Indian energy sector.

Avoiding the classification of technologies into traditional (rural) vs. advanced, since the needs of rural regions cover the complete range of energy, transportation, communications, health care, and education.

Technical content of planned projects and competence level of team participants should be decisive in funding cooperation projects.

### **WORKSHOP 3 (Technical Exchange Programmes)**

Prof. Grimm presented a statistical review of bilateral projects between France and India. Selection of high-potential students is based on their ability to perform abstract tasks well. Examples of cooperation include, among others, joint laboratories, a French-Indian cyber university since March 2003, and numerous other projects. A “double diploma” scheme is used with such advantages as increased multinational recognition, adaptability, and access to two alumni networks. The T.I.M.E. (Top Industrial Managers for Europe) Network was also mentioned.

Dr. Nastansky presented a statistical review of DAAD Germany-India projects for engineering students distributed evenly over the various engineering academic departments. Mentor visits and the exchange of scientific personnel are also funded. Following up on former DAAD students is now strived for and being currently organised.

Mr. Chatterjee summarised experience gained with China, based on the double diploma scheme.

Mr. S. Desai reported on IIT UK activities of the last two years, including meetings with dignitaries, and planning conferences to promote IITians in Britain. IITians see themselves as “global citizens”.

Prof. Biaisser announced the 2<sup>nd</sup> Meeting of the IIT-EU Alumni Association. It will take place at the ECP, Paris, during 10-11 May 2007.

Mr. A. Desai described the goals of the upcoming Global IIT Alumni Conference, Mumbai, 23-25.12.2006. The participation of some 4500 alumni is strived for. Global sponsors are sought. The contribution of IITians to “nation building” is reflected in the proposed motto: IIT = Inspire Involve Transform.

In the short discussion after the presentations of the panelists, the following topics were mentioned.

- Responding to EU calls for tenders.
- The need for simplifying EU procedures used in funding research proposals.
- The need for accelerating visa application procedures.

Mr. Tripathi thanked the panelists, the audience in the India Forum, the EEPIC, the Hannover Messe, and the entire IIT-EU organisation team for contributing to the success of the 1<sup>st</sup> IIT-EU event by volunteering to work hard across national boundaries in the public interest. Mr. Kaushik closed the conference.