

Second International IIT EU AA Annual Conference

EUROPE-INDIA T2B CONFERENCE
Partnership for Technical Education and Business Innovation
Paris, May 11th, 2007

MINUTES OF PLENARY SESSIONS AND WORKSHOPS

PLENARY SESSION S1 – INAUGURATION & OPENING SESSION

WELCOME by École Centrale Paris (ECP) and the IIT EU Alumni Association (Mr. V. Kaushik, Convener)

J. BOUCHARD, S. K. JAIN, R. MATHAI

Having given an overview of their activities in nuclear power generation, J. Bouchard, CEA, confirmed the need for using all options of electric power generation that are currently available, and listed three goals for the future: a) improving radioactive waste management, b) reducing the risk of proliferation, in general, and c) finding ways of avoiding enrichment, in particular, also mentioning the international IAEA/INPRO programme.

S. K. Jain, NPCIL, speaking for A. Kakodkar, DAE, summarized the current status of nuclear power generation in India as managed by NPCIL. All options of generation plants (BWR, PWR, PHWR) as well as Advanced Reactor concepts are being followed to meet the current and future needs for electric power.

Speaking independently from his prepared text, Ambassador Mathai, Indian Embassy – Paris, stressed the importance for India of having the youth empowered through international linkages and technology deployment leading to capacity-building. Also, by participation in supply chains that would profit rural India.

WORKSHOP W1 – NUCLEAR ENERGY

S. K. JAIN, B. RAJ, R. LOUBÈRE, V. ROLAND, D. GRENÈCHE, P. BANERJI

The workshop was attended by some 40 persons.

Dr. Jain, NPCIL, described the planned rapid growth of nuclear power generation in India. This includes about 20 light-water reactors of some 1000 MW each over the next 20 to 30 years, and several fast-breeder and heavy-water reactors, with the light-water reactors having to be imported.

Dr. Raj, IGCAR, described the status of the fast-breeder reactor programme in India. A prototype 500 MW liquid-sodium-cooled reactor is currently under construction, with a total of four such reactors being planned to be built by 2020. The contribution of such reactors to reducing radioactive waste was highlighted, also as a source of challenging future tasks for young engineers.

Dr. Loubère, CNRS – Toulouse, talked about FICUS, the Franco-Indian Cyber University project. Computational mechanics tasks would be tackled in an academic setting, under collaboration with industry, provided qualified engineering students could be recruited for challenging assignments.

Mr. Roland, AREVA NP, talked about the multi-disciplinary staffing aspects for building a robust nuclear power generation programme, including engineering, manufacturing, construction, legal, and administrative. With the expected life span of 60 years for plants that took some 10 years to build and that would have to be dismantled too, the need for knowledge management of the staff for maintaining such plants and for their economical and safe operation becomes clear.

Mr. Grenèche, AREVA NC, talked about the current issue of France being able to collaborate with India due to requirements of the nuclear non-proliferation treaty. He also mentioned technical issues of a thorium-based fuel cycle, of considerable interest for India, noting potential areas of cooperation between France and India.

Professor Banerji, IITB, talked about seismic engineering and his interaction with the DAE regarding vibration isolation for protecting nuclear facilities, and his search for partners in this area.

In the following discussion, it was noted that the opening of the Indian commercial nuclear market for foreign partners is being hampered by the non-proliferation issue. Nevertheless, NPCIL is following preliminary contacts with various overseas companies. It is expected that nuclear sites in India will have multiple units, with all areas being candidates for cooperation between Europe and India. Renewables are also being pursued in India, since all sources of energy are to be exploited.

WORKSHOP W2 – NATURAL DISASTERS & INDUSTRIAL ACCIDENTS

M. LASSAGNE, A. SCHLENKHOFF, V. SUNDAR, P. HILL, P. BISCH

Mr. Lassagne, ENSAM – Lille, described the structure of research groups working in risk management from an international perspective, existing cooperations, and potential collaboration with industry and academic and research members abroad.

Professor Schlenkhoff, BU Wuppertal, talked about the existing collaboration with IITM related to civil engineering of coastal structures subjected to wave loadings.

Professor Sundar, IITM, described his research in the area of coastal hazards (Tsunami). Numerical modelling of tsunamis and the dynamic response of warning buoys are being investigated. Potential topics of collaboration are geotextile structures and early-warning systems.

Mr. Hill, IPPC, talked about his work on the safety of oil refineries and other critical facilities. A graphic approach was illustrated regarding the earthquake loading of an oil refinery. This helps identifying hazard scenarios, their causes and consequences, and barriers available and their effectiveness.

Mr. Bisch, Séchaud, summarized advances in earthquake engineering of structures. New design approaches and tools, such as non-linear analysis for displacement-based design, were mentioned. Research needs are in understanding the effects of strong-motion duration and of number of loading cycles, control of cracking of reinforced concrete, ultimate strain of structures, displacement-based design of irregular structures, advanced methods of structural evaluation and reinforcement, passive and active controls, and related socio-economical aspects.

During the discussion period, the next EU Call for Proposals due May 15th was mentioned. Professor Shastri described current views on disasters, man-made and natural, and industrial accidents, operational, accidental, and deliberate. The UN definition of disaster was compared with civil strife, draught, and epidemics. In terms of disaster management, preplanning, early warning, and mitigation of consequences by means of, among others, educational measures at all levels, vulnerability mapping, taxation policy and a multidisciplinary approach were mentioned. The need to assess older structures was discussed as a research priority. The importance of standards and finding the proper means for their implementation were seen as further challenges.

WORKSHOP W3 – GROUND TRANSPORTATION

R. G. HERTWICH, S. BILAINE, A. MINHANS, A. K. RASTOGI, N. HUBER, J. HAMBURGER, P. GOYAL, K. SHANKER, D. L. CADET

The workshop was attended by over 70 persons.

Dr. Hertwich, DaimlerChrysler, described the role of electronics in automobiles. Their laboratory in Bangalore is expanding rapidly. Software and algorithm development is their main activity there.

Mr. Biline, Renault, talked about their joint venture in India for producing a low-cost car. A cooperation with Mahindra trucks and the planning of a large new plant, including regional cooperation with IITM, IITB, and IITD were also mentioned. Their research staff in India is expanding, carbon reduction technology transfer being included.

Mr. Minhans, TU Darmstadt, reported on transport management under disaster conditions, a topic also applicable in India.

Dr. Rastogi, Becker Technologies, gave a brief introduction of the use of hydrogen as an alternative motor fuel. The topic is being pursued actively in the EU and in India, with potential for R&D and industrial collaboration in the area of meeting environmental requirements (Kyoto Protocol).

Dr. Huber, GKSS, talked about research on light-weight structures, and their urgent need for Master and PhD engineering students in Hamburg.

Dr. Hamburger, FLUIDYN, described CFD simulations in road/rail transport of possible interest to Indian railways.

Mr. Goyal, Indian Railways, talked about their design and R&D work and requirements, including ventilation, fire simulation, anti-slip brake systems, anti-vandalism measures, and high-power locomotive systems, including active cooperation with IITK, IITR, and IITD. Technical cooperation is desired with SNCF, FLUIDYN, and in the area of boosting of axle loads.

Mr. Shanker, IITK, described their active cooperation with Indian Railways on safety issues, including work on quality of railway wheels, and the need for modernizing signalling, train scheduling, use of geopositioning systems for trains, and fog remediation.

Mr. Cadet, ALSTOM, described their power generation and rail transport capabilities. In India, the emphasis is on power utility, with some work on hybrid locomotives and subway systems.

WORKSHOP 4 – FOSSIL & BIO-FUEL ENERGY

P. LACOUR-GAYET, N. DARABIHA, Y. LEONARD, P. DUVAL, G. DAVID, K. HARSHAM, S. C. SRIVASTAVA, C. HAERTEL

Following points emerged from the mix of talks by academic and industrial representatives.

Energy industry is contributing to 10% of the GDP worldwide.

India needs to generate 10,000 MW additional electric power every year.

Bio-fuels will be playing an increasingly important role in providing an alternate source of energy.

École Centrale Paris has joint bio-fuel projects with IITs to convert waste into energy with the help of public funding.

In hydrocarbon production, modern techniques would make a 50% recovery possible.

IFP described projects on CCS, a bio-fuel, with a potential for collaboration with IITs.

CCS has high priority for TOTAL, with an additional goal of reducing CO2 capture to \$20/ton.

Potential of cellulosic ethanol development was mentioned.

WORKSHOP 5 – BIOTECH, PROCESS & ALTERNATE TECHNOLOGY

C. NATH, C. PETTENKOFER, M. GEA, R. JAIN, M. DONGARE

The workshop was attended by over 50 persons.

Mr. Nath, GL Group, talked about their work in the fields of international certification and standardization. GL Industrial Services are working closely with their Indian counterparts with fruitful results.

Dr. Pettenkofer, HMI, is working in the area of photovoltaic energy development, with some 50 PhD students doing research on solar energy.

Mr. Gea, Bio-Modeling Systems, is involved in Predictive Integrative Biology. They are also active in the field of white biotech and associated with a major regional biotech project.

Mr. Jain, Higher Designs, talked about subsea pipeline technology, including hydraulic calculations of multiphase hydrocarbon fluid transportation.

Mr. Dongare, NCL, summarized their various activities that have earned them a worldwide recognition as a center of excellence.

Many opportunities for collaboration between Europe and India remain to be explored.

Currently, only major international companies are active in this area, with many SMEs still ignoring the possibilities, due to the language barrier and a mutual lack of awareness. Here, the IIT EU AA could help offering a common platform with a specific business focus and related joint meetings.

WORKSHOP W6 - ADVANCED TECHNOLOGIES / ICT

N. FABER, M. BECKER, A. CANDA, G. BARUA, C. CLAEYS, A. SOUCEMARIANADIN, P. SIMAY, Y. BADR

Ms. Faber, RWTH Aachen, presented a new engineering PhD programme (AICES). Students get mentoring support and may graduate earlier than usual. Students from India are being sought.

Professor (Ms.) Becker, INT - CNRS, is involved in a collaboration with IISc-Bangalore and IIT-Gwalior, including GET in France and IIMs in India. Work is focused on autonomic and cross-layer networks. Additional students are sought.

Mr. Canda, HCL Technologies, talked about their business process outsourcing services in software and product engineering, as well as in infrastructure management across the telecommunications field.

Professor Barua, IIT Guwahati, presented some work on wireless mesh networks for rural areas in the developing world. Some important requirements for rural networks are: a) ability to withstand power outages, b) remote management. Additional work areas consist of multi-interface handheld compatibility, load-balancing for internet service providers, and a national testbed for quality-of-service based high-bandwidth networks. Nanotechnology was also mentioned.

Dr. Claeys, IMEC, described their mission as R&D in microelectronics, nanotechnology, and design of ICT systems ahead of industrial needs by 3-10 years. Currently, collaboration with IITB in various related areas is being reinforced by their initiative 'IMEC goes India' that includes agreements with IISc-Bangalore, IITD, and IITK. IMEC is also cooperating with key players of the Indian semiconductor manufacturing industry, ISA, SemIndia, and SCL. His recommendations based on experience to date may be useful for other institutions wishing to get active in India and are listed in his presentation.

Professor Soucemarianadin, University Joseph Fourier, described the strong synergy between research and industry in the Grenoble region, with the goal of fostering strategic alliances with India. This includes the ARCUS programme with 16 on-going projects in four areas of common interest for both French and Indian partners, such as five out of seven IITs, IITSc, JNU, BITS, and Anna University among others. This programme also offers courses in English for foreign students, including attractive stipends and accommodation facilities. A connection of ARCUS with bilateral partners over CEFIPRA and with DST is being sought.

Dr. Simay, GET, talked about the work of this federation of higher education and research institutes in engineering and management in the field of ICT supported by the French Ministry of Industry. They have a proactive international policy that has led to several joint projects with India within the FP6 of the EC. Collaboration with TCS, IIT Guwahati, and BITS Pilani was mentioned. They are now seeking further support under the forthcoming FP7 programme, including a cooperation with IITD.

Dr. Badr, INSA – Lyon, talked about their programmes focusing on an International Master in Information Systems and their IT Exchange Programme for scholars and students. Agreements are being negotiated with IITs, IISc and other Indian institutions. Their India Coordinator, Dr. Véronique Darleguy, is located in Pune. A collaboration project with IITD was mentioned. Other activities are: a) Enterprise Computing & Web Services Workshop, Bangalore, 2006, b) International Conference on Digital Information Management, Lyon, October 2007, c) Indo-European Symposium on the Frontier in Sciences and Technologies, June 2008.

During the following discussion, it was suggested for the IIT EU AA to contribute in making Europe more attractive for Indian engineering students. Dr. Rolin, INT, described their international engineering education programme for students interested in a global career, mentioning the strong demand for Indian students who would work in France before transferring to an Indian division. Dr. Srivastava, IITK, described their current research programmes in applied

electronics, including their collaboration with Samtel Industries in the area of new display technologies for replacing CRT and LCD. With the support of DST, a Nano-Centre at IITK is involved in materials research, and fabrication and testing of devices.

WORKSHOP W7 – ENVIRONMENT & SAFETY

A. BIGOT, B. DROSTE-FRANKE, R. BLATTNER, V. SUNDAR, M.-P. FAVRE, M. A. RANGDET

The workshop was attended by some 40 persons.

Dr. Bigot, ENM – Saint-Étienne, presented an overview of certain important aspects of Europe-India technology transfer in the field of Environment and Safety: a) take into account past industrial practices (difficulty of applying new engineering methods to older plants), b) emerging economy should benefit from most modern technology, c) small-scale development preferable to larger scale projects, unless the latter are really needed.

Dr. Droste-Franke, Europaeische Akademie, described the ingredients of sustainable development, resource use, energy system, and environmental effects, including current approaches such as life-cycle analysis and impact assessment, and the need for interdisciplinary staffing of projects.

Dr. Blattner, FZK/MAP, talked about their research focus on numerical modelling and experiments for quantitative explosion risk analysis relevant to hydrogen fuel cell development. Potential applicability in India in the area of fuel cells was highlighted.

Professor Sundar, IITM, reported about the advantages of a bottom-up approach, as practiced in the case of protective structures against tsunamis, involving local people and field experiments in India and collaboration with a German university.

Ms. Favre, INSA – Lyon, summarized their interaction with IITs, based on a case-by-case discussion for developing a suitable programme of partnership.

Mr. Rangdet, Environnement SA, gave an overview of measurement technology in the field of air quality. Detection of new pollutants at low concentrations requires a research effort that could be the basis of a collaboration with India.

The following discussion made clear that although the environmental regulation framework in India is comparable to that in European countries, application of the rules by decision-makers is suffering from the more urgent need to ensure basic services, such as water supply, energy resources, and waste disposal. Improved public awareness and decisions will necessitate translating environmental requirements into tangible health and economic benefits at the community level.

WORKSHOP 8 – AEROSPACE TRANSPORTATION

C. FRANK, LASALMONIE / BARRIERE, A. TRIPATHI, O. GICQUEL / CANDEL, A. MISRA

The workshop was attended by some 30 persons.

Dr. Frank, EADS, presented a brief profile of the company and talked about the growing cooperation with India. New product lines require the resources of USA, China, and India, based on research and technology partnerships in such areas as Virtual Product Engineering, On-Board Software, Aerodynamics, On-Board Energy, Core Electronics, and Sensor Technology. EADS has a Technology Centre in India, where engineering and IT services are performed. Attracting PhDs and outsourcing tasks in Materials/Structural Concepts, Advanced Systems, Alternative Energy, and HPC Real-Time Systems were mentioned as current objectives. Close cooperation with IITB and IITD has been set up.

Mr. Lasalmonie / Mr. Barriere, SNECMA, part of the SAFRAN Group, described their heavy involvement in India with some 1000 employees. Some 600 are in New Delhi, over 300 in Mumbai and Bangalore. Cooperation with IITs are in areas such as mechanical, dynamical, thermomechanical, and aerodynamics analyses, engine performance, engineering and embedded software for plane engines, CAD meshing and digital mockups. A joint venture exists between SNECMA and HAL for aeronautical parts, with another local company being Turbomeca Turbocharger Industries India. SAFRAN started offering three prizes for research excellence in India in related fields, awards for best PhDs and their supervisors to visit France, and a four-month fellowship for postdoctoral work in France.

Dr. (Ms) Tripathi, FLUIDYN France, presented an overview of their work in the field of CFD simulation with specialization in environmental flows and fluid-structure interaction. Their office in India is involved in engineering software development and consultancy support for providing applications. Examples of challenging numerical simulations in the aerospace area were shown, such as the deployment of a gliding parachute canopy and the prediction of aircraft noise. There is a need for collaborative research.

Dr. Gicquel / Professor Candel, ECP, are involved in combustion research and simulation. An example illustrating the numerical modelling of a gas turbine combustor was discussed to describe the level of computational complexity exhibited by a parallel system of a very large number of processors. Another example was cryogenic combustion of liquid oxygen and methane gas. The need for collaborative research in this area with IITs and industry in India, including sharing of related experience, was highlighted.

Professor Misra, IITB, reviewed the aerospace sector in India. IITs involved are IITB, IITK, IITKh, and IITM. IITs and IISc offer education and research programmes. Government agencies involved are NAL, working closely with HAL, ADA, and ADE. NAL is under CSIR like NPL and NCL, with ADA set up for light combat aircraft and ADE for unmanned drones used for surveillance. A fighter aircraft was developed, with further aircraft scheduled for 2012 by HAL. Light

advanced helicopter programs and assembly of aircraft such as MIGs are also being pursued. Boeing is planning an aircraft servicing hub at Nagpur.

The presentations demonstrated the growing opportunities in the field of Aerospace Transportation for future collaboration with academic, research, and industrial groups in India.

WORKSHOP W9 – TECHNOLOGY MANAGEMENT

Prof. Dutta (INSEAD, France) talked about innovation and technology strategy in a global world. Mr. Kurth (Karlsruhe University) described their executive master programs at the Hector School of Engineering and Management. Mr. Hoekstra (The Netherlands) talked about priorities for technology solutions/opportunities in India. Mr. Stich (RWTH Aachen) described their vision to strengthen IIT EU collaboration. Representatives of ENPC, ENS Cachan, ECP, and AREVA in France, as well as of IIT Kanpur and UNESCO contributed further presentations

PLENARY SESSION S2 – CONSOLIDATION SESSION

H. BOSSMANN, S. TRIPATHI, H. BIAUSSER

In this session, Moderators of the Workshops gave a brief summary of all presentations and topics of discussion, including fields of potential collaborative activities between European and Indian institutions of higher education, research, and industry.

Ms. Bossmann, DAAD, reviewed their scholarship programmes that support Indian graduate engineering students in Germany.

Mr. Tripathi spoke in the name of IIT EU AA to thank organizers, sponsors, moderators, panelists, members, and the large audience of graduate students and professionals from academia and industry, some 300 persons, for their effort and interest in making this second annual event of the Association possible.

Professor Biausser, ECP, concluded the formal programme of the day, including a note of thanks for his staff.

PLENARY SESSION S3 – FINANCING R&D PROJECTS

A. MISRA, K. PENDL, E. MATHIEU, S. PRASAD, R. BACRI, S. WILLMS, A. KAR

Professor Misra, IITB, gave a short survey of R&D activities and financing of IITs. Indian Government and State Governments are among the sources that are available. Industrial support is still largely lacking. All remedial initiatives would be welcome.

Mr. Pendl listed the various EC schemes available for supporting Euro-India collaborative research, including the procedures that have to be followed by teams applying for research funds.

Mr. Mathieu, AFII/IFA, listed research initiatives with a potential for collaboration of mixed Indo-French teams of scientists, including some current examples of funding.

Professor Prasad, CEFIPRA, outlined their role as an Indo-French initiative to fund joint research between Indian and French academic institutions, enabling researchers to organize conferences and research meetings, including travel expenses.

Mr. Bacri, CCIP, described their role in the promotion of Indo-French business, particularly for SMEs. They have opened an office in Mumbai.

Mr. Willms, EI, described some initiatives for collaborative research, related procedures, and practical examples.

Mr. Kar, Infra Technologies, is concerned with SMEs, outlining some recent projects that they have initiated and are managing in close cooperation with Europe, including helping with proposal preparation and follow-through.

PLENARY SESSION S4 – INTERNATIONAL STUDENT INTERACTION FORUM

There was interaction between the students who had come from various countries in Europe. The students had an opportunity to meet the various participants from both academia and business.

CULTURAL PROGRAMME (by S. Ahuja)

