

Issue 05
May 2015

The Fourth State

Newsletter of the Institute For Plasma Research, Gandhinagar, Gujarat (India)

From the editorial desk

The editorial committee of the IPR newsletter wishes to thank all the IPR staff members for their encouragement and support that they have given to the revived newsletter. We hope that this will continue for all the forthcoming issues of "The Fourth State". Please feel free to send any comment / suggestion to the committee at <newsletter@ipr.res.in> for improvement of the look and contents of the newsletter.

Visit of NAAC Accreditation Team to IPR

A team of experts from the NAAC visited IPR on 29-30 April, 2015 to assess the facilities of IPR. This visit was part of the process of obtaining NAAC accreditation of the Homi Bhabha National Institute (HBNI) under which many of IPR staff are faculty members and also the institute that grants PhD degree to IPR students.

The team of Prof. S. M. K. Quadri (Engineering Science, J&K University) and Prof. S. Dan (Physical Science, Burdwan University) accompanied by Shri S. K. Singh of HBNI had meetings with the faculty, non-teaching staff as well as students. They also visited the various laboratories in IPR. Prof. Dhiraj Bora gave an introductory talk on the history of IPR and its activities while Prof. Amita Das and Prof. Prabal Chattopadhyay gave brief accounts of the various theoretical and experimental research activities being undertaken at IPR.

On 30th April, the NAAC team visited some of the other facilities at IPR such as Library and the Computer center and also addressed a gathering of IPR academic staff.



The meeting with the NAAC team in progress at IPR



(L) : The NAAC team interacting with IPR faculty. (R) : Prof. D. Bora with the NAAC team members.

The science of today is the technology of tomorrow

Plasma pyrolysis technology for non-biomedical waste disposal developed by FCIPT was transferred by IPR to M/s B L Engineering, Ahmedabad on a non-exclusive basis. The technology transfer agreement was signed between IPR & B L Engineering on 18th March 2015 at IPR, Bhat, Gandhinagar. The agreement was signed by Mr. A. Varadarajulu on behalf of IPR and Mr. B. L. Sutar on behalf of B L Engineering. This agreement will enable B L Engineering to effectively market and promote eco-friendly waste disposal technology.



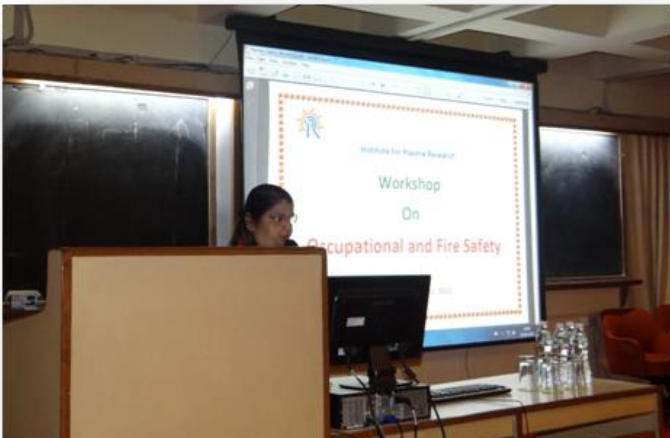
L-R : Prof R Jha, Dean, IPR, Shri A Varadarajulu, Prof Bora and Shri B L Sutar signing the MoU. Exchanging the signed documents.

Workshop on Occupational Safety

IPR observed the “Fire Service Week” by organising a two days’ workshop on Occupational and Fire Safety during 16-17 April 2015. A total of 58 participants from IPR and ITER-India attended the workshop. The workshop was inaugurated by Associate Dean, Prof. Amita Das. The Chairman, Safety Committee, Dr. D. Chenna Reddy, made special remarks.

Experts from various fields from IFFCO, Kalol, Torrent Power Ltd., Ahmedabad, Heavy Water Board, Vadodara and Kakrapar Atomic Power Station, Vyara, delivered talks on various topics related to safety and fire.

The Director presided over the valedictory session. He spoke about the accidental deaths observed due to fire and electrocution in India in 2013. The vote of thanks was delivered by Mr. D. V. Modi, Safety Officer.



L-R : Prof. Amita Das delivering the inaugural speech. Lecture by one of the invited safety experts.



L-R : View of the participants of the workshop. Live demonstration of firefighting techniques for the workshop participants.

10th IAEA Technical Meeting @ Ahmedabad

3

The 10th IAEA Technical Meeting on Control, Data Acquisition and Remote Participation for Fusion Research was organized by IPR during 20-24 April 2015. The topics covered in this meeting were ; Plasma Control, Machine Control, Monitoring, Safety and Remote Manipulation, Data Acquisition and Signal Processing, Database Techniques for Information Storage and Retrieval, Advanced Computing and Massive Data Analysis, Remote Participation and Virtual Laboratory, Fast Network Technology and its Application etc.

Of the 130 delegates who participated in this meeting, around 50 were from various international institutions.



L-R : Lighting the lamp during Inauguration. Addresses by Prof D. Bora and Dr. Richard Kamendje (IAEA Scientific Secretary).



View of the participants during the technical sessions.



Group photo of the Meeting.

Implementation of Zimbra Email System @ IPR

Upgrading from the open source email system that IPR was using since many years, the new Zimbra email system was introduced by the Computer Centre for IPR staff from 14th of April 2015.

Some of the main features of this email system are ; professional interface, facility to push emails to mobile devices, calendar management, file sharing, in-line attachment view, drag & drop attachments etc.

A series of introductory sessions were also held to train IPR staff on the operation and features of Zimbra email system.



On 27th March 2015, the Final Design Review Meeting covering the remaining lots of piping for ITER Component Cooling Water System, Chilled Water System and Heat Rejection System was held at IPR, Gandhinagar. The review panel which consisted of members from ITER Organization, ITER-India and experts from Nuclear Power Corporation of India Ltd. (NPCIL) was chaired by M. S. Shelar from NPCIL.

During this meeting, the designer M/s Larsen & Toubro (L&T) presented the final design with regards to aspects like design calculations, analysis, qualification, manufacturability & constructability and manufacturing plan which led to comprehensive technical discussion among the participants. The review panel appreciated the quality output resulting out of the hard work and collaborative efforts of L&T, ITER-India and ITER Organization; and gave useful recommendations to be complied with. The review panel will meet again remotely to finalize the technical recommendations for the close-out of the review. Apart from this meeting, ITER Organization members of the review panel visiting India also had the opportunity to see the Cooling Tower manufacturing facilities located near Kolkata and Delhi.

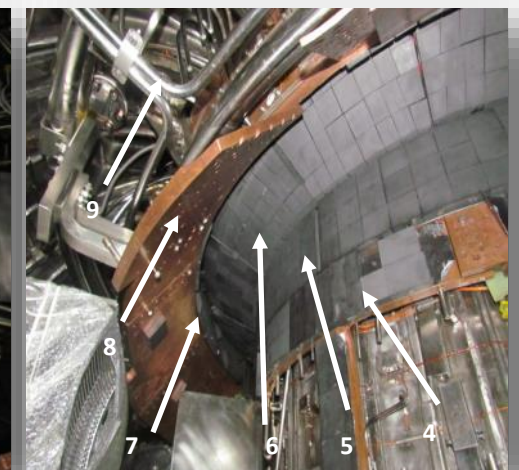
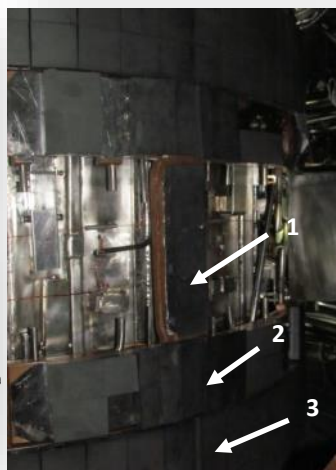
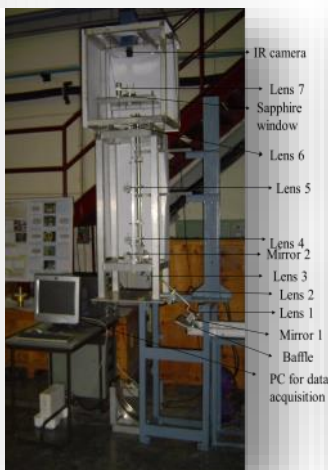
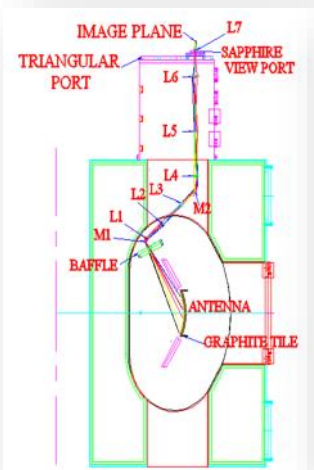


(Left) Participants to the design review with M. S. Shelar from NPCIL chairing the review panel. ITER-India Cooling water system design team is led by Ajith Kumar (Project Manager) and Dinesh Gupta (Technical Responsible Officer).

(Right) ITER Organization members Steve Ployhar and Liliana Teodors and ITER-India engineers Lalit Sharma & Jinendra Dangi at Paharpur Cooling Towers manufacturing facility near Kolkata. Seen behind is a 10 meter Cooling Tower fan, similar as for the ITER Heat Rejection System.

SST-1 News

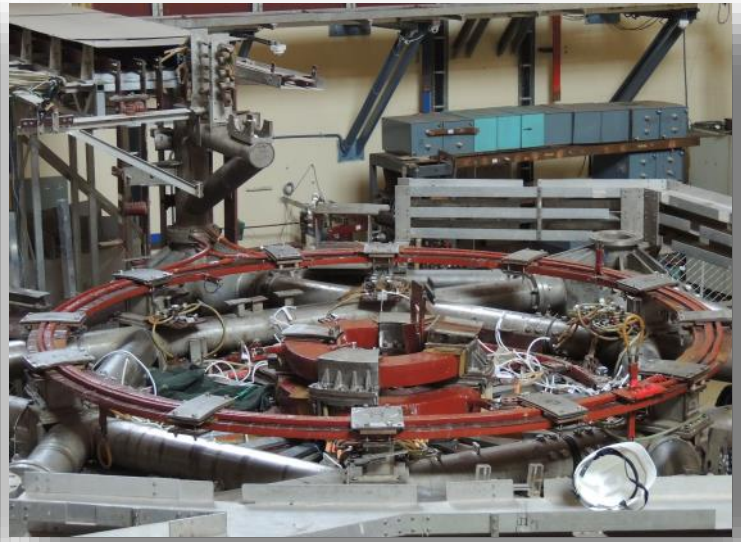
Installation of First wall components is progressing at a fast pace. Final installation of the top -bottom Inner passive stabilizer (IPS), top -bottom Inboard divertor (IDP), top main baffle (MABF), top outboard divertor (ODP) and top outer passive stabilizer (OPS) have been completed with their hydraulic connections. Stringent quality measures are being ensured during the installation of these components. Efforts are being put to install additional diagnostics like Hard X-ray and Thermal imaging diagnostic for Lower Hybrid current drive (LHCD), Fast reciprocating probe are also been pursued.



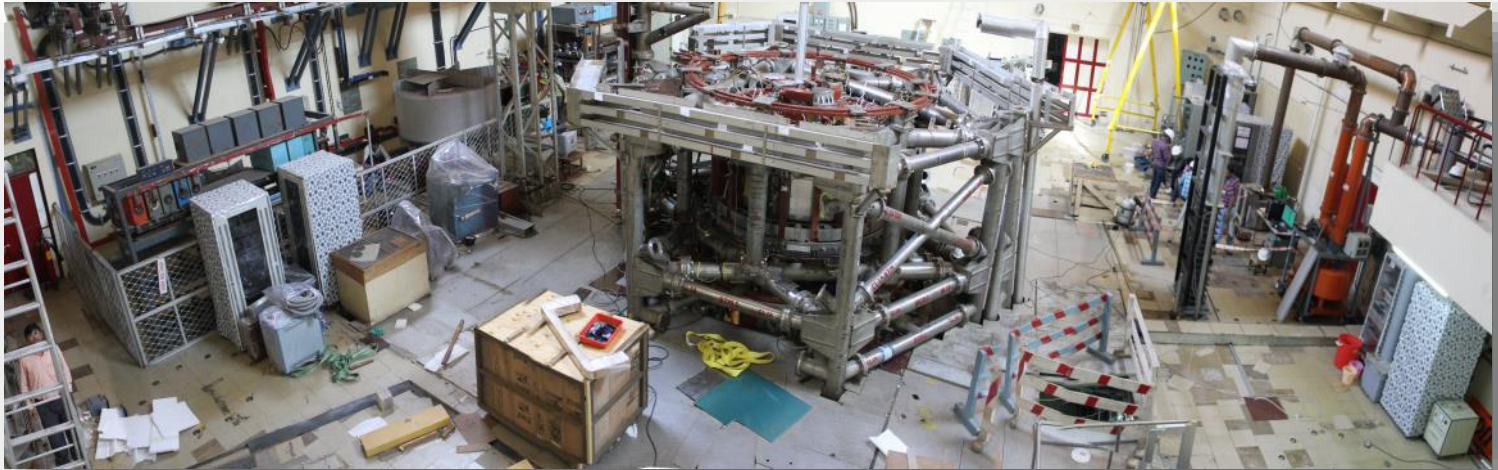
Thermal imaging system for Lower Hybrid current drive (LHCD) antennae has been installed and aligned at top port no.4 in SST-1 by SST-1 operation group.

Installed components inside SST-1 Vacuum vessel: (1) Inner passive stabilizer current bridge (2) bottom Inner passive stabilizer ring (3) bottom inboard divertor (4) top inner passive stabilizer (5) top inboard divertor (6) top main baffle (7) top outer divertor (8) top outer passive stabilizer (9) PF 6 coil

The dismantling process of Aditya machine for its upgradation is going on in full swing. The following images show the progress as on April 2015. Almost all of the diagnostic systems of Aditya have now been dismantled and taken away from the Aditya hall. The vacuum vessel, support structure and the magnetic coils are now clearly visible.



The support structure, coils and the vessel of Aditya now visible after the diagnostics have been removed.



Panoramic view of the Aditya hall and the machine after the diagnostics have been removed.

From The IPR Archives



Scenes from the IPR library in 1997. Those were the days when journals used to be only in print and one had no other choice but to spend time in the library ! The aroma of old books combined with the silence made the library a very popular place.

- ◆ **Mr. Pravesh Dhyani**, Institute for Plasma Research, gave a talk on "Biased Electrode Experiments in ADITYA tokamak" on 09th April 2015
- ◆ **Dr. B.B. Nayak**, Institute of Minerals & Materials Technology (IMMT), Bhubaneswar, gave a talk on "Preparing nanotube bundles by plasma method: approach for evaluation and application" on 09th April 2015
- ◆ **Prof. S P Sukhatme**, Professor Emeritus, IIT Bombay, gave a talk on "Estimating India's Future Needs of Electricity" on 22nd April 2015 (Colloquium # 249)

Upcoming Events

- ◆ Pulsed Power Conference (2015 PPC) and Symposium on Fusion Engineering (SOFE 2015), Austin, Texas, USA, 31 May - 4 June 2015 <http://ece.unm.edu/ppcsofe15/>
- ◆ 10th Annual International Conference on Numerical Modeling of Space Plasma Flows (ASTRONUM 2015), Avignon, France, 8-12 June 2015 <http://irfu.cea.fr/ASTRONUM2015/>
- ◆ International Workshop on Warm Dense Matter, Kurashiki, Japan, 8-13 June 2015 <http://www.ppc.osaka-u.ac.jp/WDM2015/>
- ◆ 21st ITPA Divertor and Scrape-Off Layer TG Meeting, Princeton, New Jersey, USA, 9-12 June 2015 <http://itpa2015.pppl.gov/index.html>
- ◆ 42nd European Physical Society Conference on Plasma Physics, Lisbon, Portugal, 22-26 June 2015 <http://www.ipfn.ist.utl.pt/EPS2015/>
- ◆ 46th AIAA Plasma dynamics and Lasers Conference, Dallas, United States, 22-26 June 2015 <http://www.aiaa-aviation.org/PDL/>
- ◆ 28th ITPA Topical Group on Diagnostics combined with the NIFS Collaboration Workshop on "Advanced Diagnostics for Burning Experiments of Magnetic and Inertial Fusion" which will be held for 19th - 22nd May 2015 at NIFS, Japan.

Silver Stars Of IPR



Dr. Sudhir Kumar Nema, Phd in Polymers and Allied Field, joined IPR in 1993. He presently works at Facilitation Centre for Industrial Plasma Technologies (FCIPT) division of IPR in the field Plasma Processing and Plasma Chemistry. Various plasma based technologies have been developed under his guidance and a few of these have been successfully transferred to Industries. His major contributions are in the development of plasma pyrolysis technology using non-transferred thermal plasma for the safe disposal of biomedical and plastic waste, energy recovery from waste, and in the development of non thermal plasma based technologies for surface modification of Angora wool to enhance cohesion among fibres, environment friendly plasma technology to achieve optimum rubber to brass bonding, glass like coating on metals and alloys using plasma enhanced chemical vapour deposition. He has several patents and papers in the arena of plasma processing and its applications. He has authored a book on "Plasma Technologies for Textile and Apparel". He has been conferred with Dr. Vikram Sarabhai Award (Environment) for the year 2002–2003 for the work on Safe Disposal of Hospital Waste by Plasma Pyrolysis by the Government. of Gujarat. He is also a recipient of the National Academy of Sciences, constituted NASI-Reliance Industries Platinum Jubilee Award 2010 for Application Oriented innovations in the field of Physical Sciences.

Dr. Ravi A. V. Kumar joined IPR in 1993 after his PhD in Laser applications from CUSAT, Kochi. He was involved in the mm wave Free-Electron Laser (FEL) project at IPR, and his team was able to obtain the first radiation from an Indian FEL device. He was awarded the Japan Society for the Promotion of Science (JSPS) post-doctoral fellowship during 1999-2001 and in Japan, he worked on both experimental and simulation of Linac based Far-Infrared FEL. Since 2007, he has been involved in the functioning of the Board of Research in Fusion Science & Technology (BRFST) and the National Fusion Programme (NFP). He is also the Member Secretary of the newly formed Plasma & Fusion Research Committee (P&FRC) of the Board of Research in Nuclear Sciences (BRNS). He heads the Computer Division as well as the Accelerator Division of IPR. Currently he is involved in setting up of a 50 MeV electron LINAC facility at IPR. He is also involved in IPR's outreach activities.



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