



ISO - 9001 : 2008 Organisation  
Vol. 22, No. 2  
July - December, 2009

# AERB

## Newsletter

### ATOMIC ENERGY REGULATORY BOARD

**Mission:** The mission of Atomic Energy Regulatory Board is to ensure that the use of ionizing radiation and nuclear energy in India does not cause unacceptable impact on the health of workers and the members of the public and on the environment.

#### CONTENTS

- From the Chairman's Desk.....1
- Shri S. S. Bajaj appointed as new Chairman of AERB .....2
- Safety Review and Regulation.....3
- Human Resource Development.....4
- Safety Research Programme .....4
- Report on .....5
  - 26<sup>th</sup> DAE Safety & Occupational Health Professionals Meet
  - Workshop on 'Awareness on Safety & Regulatory Requirements of BSM Facilities'
  - Quality Management System of AERB
  - Official Language Implementation in AERB
  - Inaugural Address by Shri. S. K. Chande, Vice-Chairman, AERB at the 7<sup>th</sup> Biennial Conference of NCSI, Mumbai
  - Secretary, AERB inaugurates FICCI's Technical Awareness Meet, New Delhi
- AERB Day - 2009 .....8
- Obituary/Tributes.....9
  - A Tribute to Shri M.S.R.Sarma
  - PN. Krishnamoorthy: A Pioneer in Radiological Protection
  - A Tribute to Shri J. C. Shah
- Press Releases.....10
- Feature Article .....11
  - Reorganization of Radiological Safety Functions at Nuclear Power Plants
- Home Page .....12

### From the Chairman's Desk

The major consents issued by AERB during July to December 2009 comprised of Clearances for First Approach to Criticality and conduct of Low Power Phase-B Physics Tests and Phase-C Commissioning (Synchronization of TG set and operation of Plant upto 50% of Full Power) for RAPP-5; PHT System Hot Conditioning and Light Water Commissioning, Initial Fuel Loading and Addition of Limited Quantity (~20 Tons) of Heavy Water in Moderator System for RAPP-6 and, Erection of Major Equipment for PFBR. The publication of revised Safety Code on 'Design of Pressurised Heavy Water Reactor based Nuclear Power Plants' and Safety Guidelines on 'Uranium Oxide Fuel Fabrication Facilities' was approved by the Board.



A team of officials from AERB, with the help of police, successfully recovered an industrial radiography device of a private radiography company that had fallen from a moving vehicle during transportation from Pune to Mumbai. The radioactive source in the device was found intact and inside its shielding and as such did not pose any radiation hazard.

A feature article on 'Reorganization of Radiological Safety Functions at Nuclear Power Plants' is presented in this issue of AERB Newsletter.

One of the senior members of AERB, Shri S.P. Agarwal, Head, Radiological Safety Division retired on superannuation on August 31, 2009 and Shri S.A.Hussain took over the charge as Head, Radiological Safety Division. Seven young Engineers/Scientists joined AERB during August/September this year.

AERB staff were deeply grieved by the sad demise of three of their former stalwarts; Shri M. S. R. Sarma, the first Chairman of SARCOP, AERB, on October 4, 2009, Shri P. N. Krishnamoorthy, the first Member-Secretary of the Board of AERB, on November 16, 2009 and Shri J. C. Shah, Former Member of the Board on November 18, 2009.

I will be laying down office in January 2010 after being the head of the AERB family for five eventful years. AERB has grown in strength and stature over the years and today it is recognized as a highly competent and vibrant regulatory body, nationally as well as internationally. My tenure in AERB was highly rewarding and professionally satisfying. I received extraordinary cooperation from all the staff members and I would like to record my heartfelt appreciation and thanks to each one of them.

On January 14, 2010, the auspicious day of *Makar Sankranti*, Shri.S.S.Bajaj, former Senior Executive Director (Safety), Nuclear Power Corporation of India Limited will assume the charge of the post of Chairman, AERB. Shri Bajaj brings with him over 40 years of rich experience in a variety of fields related to safety. These encompass safety of reactor core, radiological safety, reactor containment and probabilistic safety analysis to name a few. I am certain that under his dynamic leadership, AERB will scale newer heights. I wish Shri Bajaj the best in his new assignment.

I would also like to avail myself of this opportunity to wish all the readers of AERB Newsletter and the staff member of AERB and their families a 'Happy and Prosperous-2010'.

(S. K. Sharma)

## Shri S. S. Bajaj appointed as new Chairman of AERB

Shri S. S. Bajaj has been appointed as Chairman of the Atomic Energy Regulatory Board (AERB) in place of Shri S. K. Sharma who relinquished charge on January 14, 2010 on expiry of his tenure as Chairman, AERB. Prior to this, Shri Bajaj has been serving under Raja Ramanna Fellowship Scheme of Department of Atomic Energy (DAE) and advising various units of DAE on safety issues. He retired as Senior Executive Director (Safety) from Nuclear Power Corporation of India Limited (NPCIL) in July 2007.

Shri S. S. Bajaj, a Mechanical Engineer, began his career with the Department of Atomic Energy in 1969 after completing the 12<sup>th</sup> Batch of BARC Training School.

His specific areas of work have included reactor safety analysis, system thermal hydraulics, plant transient studies, probabilistic safety assessment, system safety studies and reviews, containment engineering and reactor physics and fuel safety.

Shri Bajaj played a pioneering role in successfully establishing a sound infrastructure in NPCIL for safety analysis of Indian Pressurized Heavy Water Reactors (PHWRs), both deterministic

and probabilistic. He has been closely involved in the development and validation of several computer codes for safety analysis. He performed several pioneering and definitive safety studies for PHWRs covering plant-wide response to postulated/actual events and to identify preventive/mitigative actions.

Shri Bajaj has been associated with several AERB Committees for design and operational safety review of nuclear power plants. He has also actively contributed to preparation of several regulatory Safety Codes and Guides.

Shri Bajaj is a recipient of the Indian Nuclear Society Award for outstanding achievements in Nuclear Technology including Nuclear Safety and is a Fellow of the Indian National Academy of Engineering.



**Shri S. S. Bajaj  
new Chairman, AERB**

## Farewell to Shri S. K. Sharma

A fond farewell was given to Shri S.K. Sharma on January 13, 2010 on expiry of his tenure as Chairman, AERB. Shri R. Bhattacharya, Director, IPSD, AERB briefed the large audience about the profile of Shri Sharma right from his entry into DAE family. Dr. Banerjee, Chairman, AEC also bid a fond farewell to him. Shri S. K. Mehta, Consultant, AERB who has been a long associate of Shri Sharma spoke on the occasion. Various dignitaries from NPCIL, HWB like Dr. S. K. Jain, CMD, NPCIL and Shri A.L.N. Rao, CE, HWB, etc. also brought out the professional and personal traits of Shri Sharma. Shri S. K. Chande who has been working with him since long in various capacities like Member-Secretary, SARCOP and Vice-Chairman, AERB said that his guidance in every matter was useful to all in AERB for bringing

about a smooth working environment in AERB. It was in his period that AERB progressed a lot and has earned a place as a perfect regulatory body in India, he said. Again, it was during his period that AERB became an ISO 9001:2008 certified body, one of its kind in India. He also welcomed Shri S.S. Bajaj on this occasion. Shri Bajaj, Chairman, AERB wished Shri Sharma a fruitful retired life ahead. Dr. Banerjee, Chairman, AEC said that AERB will be facing challenging tasks ahead and appreciated Shri Sharma's efforts to groom an organization to such an extent that they are able to face any challenge ahead. Shri Sharma in his usual humorous and thought provoking thanksgiving speech said that it were the efforts put in by every AERBite that has earned AERB such a reputation. He thanked one and all.



**Fond farewell to Shri S. K. Sharma, the outgoing  
Chairman of AERB**

(L to R): Shri S.K. Chande, Vice-Chairman, AERB; Dr.S. Banerjee, Chairman, AEC; Shri S.S. Bajaj, Chairman, AERB and Shri S.K. Sharma, outgoing Chairman, AERB



**Fond farewell to Shri S.K. Sharma by Shri S.S. Bajaj,  
the new Chairman of AERB.**

## SAFETY REVIEW AND REGULATION

### AERB Board Meetings

The ninety-ninth Board Meeting was held on October 22, 2009 in Atomic Energy Regulatory Board, Mumbai. The Board approved the publication of the revised AERB Safety Code: AERB/NPP-PHWR/SC/D/2009 (Rev. I) on 'Design of Pressurized Heavy Water Reactor Based Nuclear Power Plants'.

The revised code includes new sections on (i) safety objectives and concepts, (ii) requirements for management of safety, (iii) principal technical requirements and (iv) plant design requirements, new subsections on (i) considerations in design for mitigation of severe

accidents and (ii) use of systems beyond their design capabilities and support from other units for multi-unit sites to mitigate the consequences of severe accidents. Additional clauses are introduced for use of both deterministic and probabilistic approaches in safety analysis, requirements have been laid down for level-I probabilistic safety assessment, computer based systems, ageing of all structures, systems and components important to safety, etc. New requirements are laid down on grid-plant interaction and requirements on equipment qualification and human factor in design of a plant are updated.

#### Consents Issued (July – December 2009)

Authorisations for First Approach to Criticality for RAPP-5 and for conduct of Low Power Phase-B Physics Tests and Phase-C Commissioning (Synchronization of TG set and operation of Plant upto 50% of Full Power) for RAPP-5.

Clearance for PHT system Hot Conditioning and Light Water Commissioning of PHT system, Initial Fuel Loading and addition of limited quantity (20 tonnes) of Heavy Water in Moderator System for RAPP-6

- Renewal of authorisation for operation of RAPS Unit-2, restart of the Unit after EMFR campaign and permission for synchronization and operation at high power.
- Renewal of Authorisation for Operation of KAPS Unit-2.
- Clearance for Erection of Major Equipment for PFBR.  
Construction clearance for augmentation and modernization of Chlorination Facility at NFC-Hyderabad.
- Commissioning authorisation of Turamdih mill, UCIL was extended upto February 2010.
- Permission for charging of Phosphoric Acid into the Technology Demonstration Plant (TDP) for recovery of rare metal from phosphoric acid at RCF, Mumbai.
- License for operation of 750 keV DC Accelerator at RRCAT, Indore.
- Licences under the Atomic Energy (Radiation Protection) Rules, 2004 for the following Beach Sand Minerals Facilities were issued.
  - M/s IREL, Chatrapur, Orissa
  - M/s IREL, Chavara, Kerala
  - M/s IREL, Manavalakurichi, Tamil Nadu
  - M/s Beach Minerals Company Pvt. Ltd., Tamil Nadu
  - M/s Cochin Minerals and Rutile Ltd., Kerala
  - M/s Blast Abrasive Pvt. Ltd., Orissa
  - M/s The Kerala Minerals and Metals Ltd., Kerala
  - M/s Transworld Garnet India Pvt. Ltd., Tamil Nadu
  - M/s Transworld Garnet India Pvt. Ltd., Andhra Pradesh
  - M/s Trimex Sands Pvt. Ltd., Andhra Pradesh
  - M/s DCW Ltd., Tamil Nadu
  - M/s Miracle Sands and Metals, Tamil Nadu
  - M/s V.V.Mineral, Tamil Nadu

#### Regulatory Inspections (July – December 2009)

Unit	No. of Inspections
<b>• NUCLEAR FACILITIES</b>	
UCIL.-Mines-Jaduguda, Bhatin, Narwapahar, Turamdih, Banduhurang, Mohuldih, Tumallapalle	1 each
UCIL.-Mill- Jaduguda, Turamdih & Tumallapalle	1 each
IREL.- Chavara, Manavalakurichi, OSCOM & Udyogamandal	1 each
NFC-Hyderabad	1
HWPs - Kota, Talcher, Baroda, Hazira	1 each
HWPs-Thal, Manuguru	2 each
ECIL -Hyderabad	1
VECC, Kolkata & RRCAT, Indore	1 each
RAPS-3&4/RAPPCOF, MAPS-1&2, KGS-1&2, TAPS 1&2, KAPS-1&2, NAPS, TAPS-3&4, KGS-3, RAPS-1&2	1 each
FRTG, LML, CG (IGCAR)	1 each
Rajasthan Atomic Power Project 5&6 (RAPP 5&6)	1
Kudankulam Nuclear Power Project (KKNPP)	2
Prototype Fast Breeder Reactor (PFBR), Kalpakkam	2
Kakrapar Atomic Power Project-3&4	1
Kaiga Generating Station-4	1
DFRP & IFSB	1 each
KKNPP, PFBR, DFRP, NFC (ZC) –Pazhayakal, EBP, HWP-Manuguru, VSPP, HWP-Talcher, TDP, RCF, Chembur, HEWAC, HWP-Kota projects (Special inspections on Industrial Safety)	22
Non-DAE Beach Sand Minerals Facilities	6
<b>• RADIATION FACILITIES</b>	
Industrial Radiography facilities	23
Gamma Irradiators	6
Nucleonic Gauges	2
<b>• Medical Installations</b>	
Nuclear Medicine	11
Diagnostic X Rays	10
Radiotherapy Facilities	3

## HUMAN RESOURCE DEVELOPMENT

### Induction of New Staff

In the eleventh five-year plan, 78 scientific and 25 technical new posts have been sanctioned for AERB. These posts are filled through various channels as given below:

- BARC Training Schools: 4 trainees were inducted.
- IIT-Bombay and Madras: 6 students have been sponsored for M.Tech. under AERB Graduate Fellowship Scheme (AGFS).
- Posts have been advertised to induct experienced engineers and scientists at SO/D and SO/E level from the open market.
- Efforts are being made to induct experienced engineers and scientists from various DAE units.
- Five Radiation safety experts with Diploma in Radiological Physics are being inducted.

### Training

The orientation training of AGFS fellows from IIT-Bombay and IIT-Madras has been organized in the BARC Training School. The on-

the-job training of newly inducted scientific officers from BARC training schools is being organized in IGCAR, Kalpakkam and in Nuclear Power Plants.

### AERB Technical Talks

Technical talks were arranged on the following topics.

- 'Use of Unicode Fonts' - a technical talk in Hindi by Shri V. P. Gholap on July 24, 2009.
- 'Safety in Transport of Radioactive Material' by Shri S. P. Agarwal and Shri A. U. Sonawane, RSD, AERB on July 27, 2009.
- 'Experimentation and Modelling of Passive Decay Heat Removal System in Nuclear Reactors', by Prasad S. Wani, M.Tech. Student, IIT, Bombay.
- 'Thermodynamic Data Base for Phase Stability Calculations for Plant Stability pertaining to P91 Steels and its Derivatives' by J. Christopher, M.Tech. Student, IIT, Madras.

## SAFETY RESEARCH PROGRAMME

AERB Committee on Safety Research Programme (CSRP) met at SRI, Kalpakkam on November 19-20, 2009 to review the proposals submitted for approval of the new research projects and renewal of old projects.

Five on-going research projects were reviewed and seven new project proposals were considered for funding. The Committee recommended approval of grant-in-aid for the following three projects after detailed deliberations.

Sr. No.	Project Title	Principal Investigator/Institute
1.	Development and Testing of Indigenous Affordable 3D Radiation Field Analyser	Dr. K.M. Ganesh, Kidwai Memorial Institute of Oncology, Bangalore, Karnataka.
2.	Establishment of Diagnostic Reference Levels (DRLs) in Select Procedures in CT Imaging	Dr. K.N.Govinda Rajan, PSG College of Technology, Coimbatore, TN.
3.	Studies on the Transport of Hydrogen-Air-Steam Mixture Within a Confinement	Dr. S.K. Das, IIT-Madras, Chennai, TN.

Three members of CSRP, along with the coordinators of the Projects, visited the VIT Vellore, New College, Chennai, Pondicherry University and Annamalai University where there are on-going research projects of AERB and interacted with the Principal Investigators, research scholars including the junior / senior research fellows of the AERB projects and visited the laboratory facilities available in the Institute. At one of the institutes i.e. Vellore Institute of Technology, Vellore, a senior member of CSRP, Dr. Om Pal Singh, delivered a talk on 'AERB Safety Research Programme' to the faculty members and the research scholars of the institute.



**CSRP Members & Project Investigators witnessing the indigenously developed "Optical CT Scanner" at Vellore Institute of Technology (VIT), Vellore, Tamilnadu.**

(L to R): Shri Senthilkumar (Research Scholar, VIT), Dr.Velmurugan (Project coordinator, Anna University), Dr.R.M.Nehru (Project Coordinator, AERB), Dr.Om Pal Singh (Member - CSRP, Secretary, AERB & Director, ITSD, AERB) and Dr.Jabaselan (Principal Investigator, VIT)

### 26<sup>th</sup> DAE Safety & Occupational Health Professionals Meet at VECC, Kolkata

The 26<sup>th</sup> DAE Safety & Occupational Health Professionals Meet was jointly organized by Atomic Energy Regulatory Board, Mumbai and Variable Energy Cyclotron Centre (VECC), Kolkata in the Saha Institute of Nuclear Physics (SINP) Centre, Kolkata during November 16 – 18, 2009. The theme of the Meet was “Cryogenic Safety, Electrical Safety and Ergonomics at Workplace”. This year, for the first time, the DAE aided institutes also participated in the Meet.

Dr. Anil Kakodkar, Chairman, AEC & Secretary, DAE inaugurated the Meet. Dr. R.K. Bhandari, Director, VECC welcomed all the delegates. Shri R. Bhattacharya, Director, IPSD, AERB briefed about the important milestones of the Meet and the highlights of this year's meet. Shri S.K.Chande, Vice-Chairman, AERB delivered the presidential address. Two booklets were released during this meet; one on “Cryogenic Safety & Electrical Safety” by Prof. Bikash Sinha, former Director, VECC & SINP and the other on “Major Unusual Occurrences” by Shri S. K. Chande, Vice-Chairman, AERB. Like every year, this year too, the Green Site Awards, which consider various factors like effective site area, efforts taken to improve the greenery, etc., were presented. The winners of this year's Green Site Awards were IREL, Manavalakurichi & Kakrapara Atomic Power Station (KAPS). Dr. Anil Kakodkar, distributed the prizes for Logo Competition and released the proceedings of the Meet. He congratulated the winners of the Green Site Award & appreciated KAPS for getting the certificate from WANO team for excellent operational performance. He praised AERB for paying the required attention to safety in the industrial domain at a time when the expansion programme is in full swing in almost all DAE units.

Shri Chande in his presidential address thanked Dr. Anil Kakodkar for his long association with this meet. He enumerated the



#### Dignitaries at the Dais displaying the release of booklets on 'Cryogenic Safety & Electrical Safety' and 'Major Unusual Occurrences' during the DAE Safety & Occupational Health Professional Meet at VECC, Kolkata

(L to R): Shri. Subimal Saha, Head, Accelerator Technology Group, VECC; Dr. R. K. Bhandari, Director, VECC; Shri S. K.Chande, Vice-Chairman, AERB; Dr. Anil Kakodkar, Chairman, Atomic Energy Commission; Dr. Phillippe Lebrun, CERN (European Organisation for Nuclear Research), Geneva; Prof. Bikas Sinha, Former Director, VECC and Shri R. Bhattacharya, Director, Industrial Plants Safety Division, AERB.

initiatives taken by AERB to improve the industrial safety standards in DAE units.

One of the highlights of this year's meet was the Dr. S. S. Ramaswamy Memorial Endowment Lecture delivered by Dr. Philippe Lebrun, CERN, Geneva on 'Engineering Science for Cryogenic Safety'. Dr. Lebrun also inaugurated the exhibition of safety appliances by various companies.

Shri M.S.R. Sarma, former Chairman SARCOP had passed away just a month before this meet. Shri R. Bhattacharya recollected his immense contributions to the field of nuclear and industrial safety. One minute silence was observed by the gathering as a mark of respect to the departed soul.

The inaugural session was followed by three technical sessions on “Cryogenic Safety”, “Electrical Safety” and “Ergonomics at Workplace”. Each of these technical sessions had three invited lectures delivered by renowned experts from DAE as well non-DAE facilities.

In the Valedictory Session, prizes for Posters, Cartoon, Slogan Competition among DAE Employees were distributed and the feedback received from various participants was reviewed. It was decided to hold the next year's meet at NFC, Hyderabad with 'chemical safety and chemical waste management' as the theme

### Workshop on 'Awareness on Safety & Regulatory Requirements of Beach Sand Minerals Facilities'

The Beach Sand Minerals such as ilmenite, rutile, leucosene, zircon, garnet and sillimanite remain invariably associated with radioactive monazite and preferential separation of these minerals leads to generation of monazite enriched tailings. Unregulated disposal of these tailings may cause undue radiological hazard to the occupational workers and members of the public. In order to familiarize the Beach Sand Minerals (BSM) facilities personnel about the necessity of radiological protection, safe disposal of monazite enriched tailings and regular radiation monitoring and also considering the request from Federation of Indian Placer Mineral Industries (FIPMI), Tamilnadu, a one-day workshop on 'Awareness on Safety & Regulatory Requirements of Beach Sand Minerals Facilities' was organized by AERB on December 4, 2009 at Niyamak Bhavan, AERB Mumbai. There were about sixty participants from various DAE and non DAE BSM facilities.

Shri K. Ramprasad, Member-Secretary, Beach Sand Minerals Safety Committee (BSMSC) welcomed all the dignitaries and participants. Shri V.K.Kansal, Chairman, BSMSC briefed about the important recommendations made during the safety review of the license applications. Shri S. K.Sharma, Chairman AERB delivered the inaugural address and highlighted the necessity for radiological protection in Beach Sand Minerals facilities. This was followed by a key note address by Shri R. Bhattacharya, Director IPSD, AERB wherein a detailed overview of the hazards of processing of monazite as well as other associated beach sand minerals, disposal of monazite enriched tailings and radiological monitoring aspects were presented. Shri S.K.Chande, Vice Chairman AERB also graced the inaugural session.

The workshop covered the topics on 'Natural Radioactivity & Fundamentals of Radiation Protection', 'Radiological Hazards, Waste Disposal, Monitoring & Dose Estimation in BSM Facilities', 'Safety during Transport of Radioactive Materials' and 'Licensing Procedure and Regulatory Requirements of BSM Facilities' by experts from BARC and AERB. The compilation of the lecture material of all these topics along with a copy of the Atomic Energy (Radiation Protection) Rules, 2004 was distributed to all the participants. In addition, there were also presentations on the operating experience from the BSM facilities such as M/s BMC Pvt. Ltd, Tamilnadu, IREL, OSCOM, Orissa, M/s KMML, Kerala and IREL, Udyogamandal, Kerala and on the issues related to licensing of BSM facilities under the Atomic Energy (Radiation Protection) Rules, 2004 by FIPMI, Tamil Nadu.

The workshop concluded with a feedback session. The doubts/queries raised on various topics were clarified. The participants appreciated the efforts of AERB for organizing this workshop and requested for organizing more such workshops in future.

staffs. Dr. P. C. Basu, Director, C&SED and MR to QMS in his welcome address talked about the purpose of the workshop. Chairman, AERB in his opening remarks said that ISO standard should also consider requirement of regulatory processes. He also mentioned that the workshop will benefit both regulator and licensee to improve the effectiveness of their processes. Vice-Chairman, AERB made his kind presence in the workshop and provided some valuable inputs during discussion. Dr. Devendra Mohan, Bureau of Indian Standards talked about the salient points of revised IS/ISO 9001:2008 standard. Shri M. K. Pathak, IPSD, AERB presented the salient points of revised QMS documents whereas Shri K. Ramprasad, IPSD talked on the Client's requirements and feedback system. Client's expectations and requirements were presented by N. P. Srivastava, Chief Engineer & MR of QA Directorate, NPCIL, Shri S.Sundaresan, Associate Director (O), Heavy Water Board and Shri Rajiv Adukia, Director, M/s A. V. Processors Pvt. Ltd.

- Reported by Dr. P. C. Basu & M. K. Pathak

### Quality Management System (QMS) of AERB

#### Revision of QMS Documents and Renewal of ISO Certification

Quality Management System (QMS) of AERB was awarded IS/ISO 9001: 2000 certification on November 15, 2006 by Bureau of Indian Standards (BIS). AERB had identified Consenting Process, Regulatory Inspection and Development of Regulatory Documents under the scope of its Quality Management System (QMS). The certificate has to be renewed every three years. IS/ISO 9001: 2000 standard has been revised as IS/ISO 9001:2008. Therefore, as per requirement of new QMS, the QMS documents such as Quality Manual and all the Level-II procedures were revised and issued.

#### Monitoring of QMS and Re-Certification Audit

Internal audits of different Divisions of AERB were carried out during September 30, 2009 - October 6, 2009. Two management review meetings, one on August 5, 2009 and other on October 23, 2009 were also held during the period to review and discuss the necessary actions taken for compliance of the non-conformances and observations brought out during internal audits. Decisions on proforma for issue of minutes of meetings, time frame, follow-up procedures for preparation of minutes of Safety Committee's Meetings were taken in EC meeting.

Re-certification audit for Quality Management System of AERB in line with IS/ISO 9001:2008 was carried out by Bureau of Indian Standards (BIS) on November 3-4, 2009. Auditors were satisfied with the performance of QMS in AERB and the renewal of ISO Certification has been issued by BIS on January 13, 2010.

#### Workshop on Promotion of Awareness of Client's Requirements

A workshop on "Promotion of Awareness of Client's Requirements" was held on August 25, 2009 for better understanding of AERB's client requirements related to the three identified processes. Around 50 participants attended the workshop including Directors/Heads of Divisions, the internal auditors, Divisional Coordinators and a few other nominated

### Official Language Implementation in AERB

A lecture by Shri Vaibhav P.Gholap, ITSD, AERB was organized on 24 July, 2009 on use of Unicode in Hindi-Work on Computer. Practical training was provided to all the participants to work with Unicode. The procedure and guidelines regarding installation and use of Unicode has also been displayed in LAN of AERB.

A Joint Hindi workshop hosted by the four DAE units i.e., AERB, DCSEM, HWB and DPS was conducted during August 10-13, 2009 at V.S.Bhavan, Anushaktinagar, Mumbai jointly.

On the occasion of Hindi Diwas-2009, a Hindi Quiz Competition was organized on September 02, 2009 in AERB. The team, who secured first position, represented AERB in joint Hindi Quiz Competition held at Vikram Sarabai Bhavan during September 7-10, 2009.

A technical paper in Hindi on 'Significance of Regulation in Nuclear Energy Safety' was delivered by Dr.Om Pal Singh, Secretary, AERB & Director, ITSD at the National Scientific Seminar on Development of Atomic Energy in India, IGCAR, Kalpakkam during September 3-4, 2009.

A Joint Hindi Workshop consisting of Hindi Stenography, Debate, Slogan Writing, Quiz and Hindi Poetry Competition was conducted during September 07 - 10, 2009 jointly by the four units of DAE Rajbhasa Co-ordination Committee situated at Anushaktinagar. The AERB received 1<sup>st</sup> prize in slogan competition and third prize in Joint Quiz Competition. Also, AERB received two first prizes in Hindi Essay Competition (Group A & B), third prize in Hindi Noting and Drafting (Group B) and third prize in Hindi Typing Competitions.

Prize distribution function for Joint Hindi Competition and a talk on "Prevention of Cancer" was organized at multipurpose hall of Training School Hostel on September 14, 2009 by the Joint Hindi Co-ordination Committee of the four units. The talk was delivered by Dr. S. Shastri, Head of Preventive Oncology Centre of TMC, Parel, Mumbai. Messages of Honorable Home Minister of India and Secretary, DAE were also communicated to the audience at the occasion.

Various Hindi Competitions were organized in AERB during November 23, 2009 to December 04, 2009 for encouragement and better implementation of Rajbhasa in day to day work. Shri Vaibhav P. Gholap is nominated as a member in DAE's core group constituted for the Hindi Computer programming in DAE & its units. The work related to bilingual web-site of AERB is under progress.

### **Inaugural address by Shri S. K. Chande, Vice-Chairman, AERB at the Seventh Biennial Conference of Nuclear Cardiological Society of India (NCSI), Mumbai (Nov. 13, 2009)**

It is a matter of great pleasure and honour for me to be here to speak in the Scientific Session of this 7<sup>th</sup> Biennial Conference of Nuclear Cardiological Society of India.

Talking about this Conference let me compliment NCSI for organizing this Conference. The technical programme of the Conference is excellent and very relevant to current situation. The last decade has witnessed tremendous advancements in the field of cardiology in general and Nuclear Medicine in particular and as a consequence, the scope of application of nuclear medicine has enhanced significantly. The number of Nuclear Medicine facilities and also the number of patients deriving benefit are increasing. And under these circumstances, this conference has provided an excellent platform for all concerned to exchange views and benefit from interaction.

In India, we have a pattern of health care demand and supply that is very much representative of many "developing" countries that are currently experiencing remarkable rates of economic growth. While many hospitals in large urban cities offer advanced diagnostic and treatment facilities that compare favorably with the best in the world, there is a lack of basic health care facilities in the rural areas. In the smaller cities and rural areas, economic considerations play a much bigger role in deciding the level of health care facilities available. Hospitals in these areas generally lack sophisticated equipment and highly trained personnel. However, the situation needs to change and every possible effort must be made to provide advance health care facilities including



**Shri S. K. Chande, Vice-Chairman, AERB lighting the lamp at the 7<sup>th</sup> Biennial Conference inaugural function organised by the Cardiological Society of India on November 13, 2009 in Mumbai.**

nuclear cardiology in smaller cities and rural areas. This is going to be very challenging, and would require investment in equipment and training of personnel.

In this regard and in the context of this conference, I would like to specifically dwell upon Nuclear Medicine facilities including those involved in nuclear cardiology. Presently there are a total of 170 functional Nuclear Medicine facilities in India, most of which are also involved in nuclear cardiology, (performing Myocardial Perfusion SPECT). All these facilities have been licensed and regulated by AERB. The role of AERB is to ensure the safety of workers without unduly restricting the beneficial activities of these facilities using radiation.

AERB has been proactive and is gearing up to meet the challenge of licensing and regulating the growing number of medical radiation facilities that are coming up. The new regulatory Guide on "Consenting Process for Radiation Facilities AERB/RF/SG/G-3" is being published. The Guide provides detailed information on the requirements and procedures to be followed for obtaining authorization for setting up and subsequent operation of these facilities. But till this Guide is formally published, all the required information is available on AERB website [www.aerb.gov.in](http://www.aerb.gov.in). More specific technical requirements for setting up Radiation Medicine facilities are given in the AERB Safety Code Med-4 Rev (01), 2001, which is also available on the AERB website. This Code specifies the regulatory requirement about competent staff, radiation protection instruments, personnel monitoring services etc. Once these requirements are met, the authorization for the procurement of radioactive source is granted by AERB.

In India, radionuclide cardiac imaging is performed only by physicians trained in nuclear medicine as their primary specialty. In case the physician desires to qualify as Radiological Safety Officer, he has to appear for a certification examination in radiological safety conducted by AERB. RSOs are considered as representatives of AERB and have the responsibility of radiological protection of staff as well as patients, apart from their other assigned duties.

The Quality Assurance in radiation facilities plays a very important role because it will not only optimize the dose to the patients but also ensures radiological protection of the staff and general public. At present there are no regulatory requirements on optimization of treatment given to patients. The doctor has the full responsibility for the well being of the patient. However, any unusual incidents that may take place need to be promptly reported to AERB.

AERB inspection teams periodically visit these facilities for regulatory inspections. While most facilities are functioning very well, there is scope for improvement in certain areas, such as availability of calibrated radiation monitoring instruments, periodic radiological survey of the facilities and maintenance of records pertaining to radiation safety. In some cases, modifications are carried out in the layout plan approved by AERB without taking prior permission. All the users of these facilities are required to comply with the guidelines issued by AERB.

AERB does not confine itself only to the regulatory activities but also tries to promote radiological safety awareness and is ready to provide advice on radiological safety related issues. This benefits

## REPORT ON

not only the nuclear medicine community at large but also the general public and the environment.

On this occasion of this Biennial Conference of NCSI, I would urge the nuclear medicine community to exercise cautious optimism and adopt a responsible approach to this evolving technology. We must strike the right balance between the benefits of nuclear energy and the risk to the workers and the community. AERB on its part is committed to achieve such balance.

The deliberations during this Conference will definitely provide a platform for dissemination of knowledge and exchange of ideas among the practitioners of this very important discipline.

I wish the Conference a great Success.

### **Secretary, AERB inaugurates FICCI's Technical Awareness Meet on "Quality Assurance and Radiation Safety in Interventional Radiology"**

With the rapid growth in Diagnostic Facilities and induction of state of the art technologies requiring updated knowledge and skills and increased awareness about Quality Assurance (QA) and Radiation Safety in Interventional Radiology (IR), Federation of Indian Chambers of Commerce and Industry (FICCI) organized one day Technical Awareness Meet on "Quality Assurance and Radiation Safety in Interventional Radiology" on October 10, 2009. The meet was supported by AERB & the Board of Research in Nuclear Sciences, Govt. of India. More than 200 participants from across India, comprising of radiologists, doctors, medical superintendents from leading private and public healthcare sectors and radiation safety officer of several states attended the Meet.



**Dr. Om Pal Singh, Secretary, AERB addressing as Chief Guest at the Technical Awareness Meet in New Delhi on October 10, 2009.**

The Meet was inaugurated by Dr. Om Pal Singh, Secretary, AERB & Director, ITSD, AERB. In his Inaugural address, Dr. Singh pointed out that Interventional Radiological Techniques are life saving techniques. However, since these techniques use the ionizing radiations, there is a potential for harm to the patient and in certain type of applications even to the radiologists. Further, as these techniques need large number of high quality images, the radiation risk in IR is greater than the use of conventional techniques. Therefore, challenge in IR is to invent procedures and

methodologies that help in minimizing the dose to the patient as well as to the IR professionals. He then highlighted the importance of Radiation Safety, the benefit of multi modalities and implementation of standardization of equipment and their Quality Assurance in Interventional Radiology. He also highlighted the key role of AERB in improving radiation safety in terms of preparing regulatory and safety codes, guides and procedures, regulatory review, regulatory inspection and enforcement, and emphasis is on increasing induction of advanced technologies and Quality Assurance programme implementation.

The participants appreciated the role of AERB in achieving radiation safety in Interventional Radiology. Dr. Singh congratulated the organizers for organizing the Meet which is quite timely and important from radiation safety point of view in IR and expressed hope that the deliberations in the meet would lead to better understanding of QA procedures and radiation safety to be followed in IR and hence better radiation safety in IR procedures. He also emphasized the need for organizing such meets more frequently to bring awareness among IR Professionals about the importance of QA and radiation safety in Interventional Radiology.

## AERB DAY - 2009

The AERB Day was celebrated on November 21, 2009 at AERB Lawns. More than four hundred AERB staff and their family members graced the occasion. The celebration started with the welcome address from Shri Vaibhav P. Gholap, Secretary, AERB Staff Club. This was followed by a Cultural Programme consisting of dances, songs, instrumental music, etc. and was presented by AERB staff and their family members. A few professional singers like Monalisa De, Shriti Kantwal and Suresh Lalwani rendered beautiful old and new songs. The winners of various sports tournaments conducted by Staff Club in the year 2009 were presented prizes.



**AERB staff in colorful Rajasthani Costumes at the AERB day celebration**



**AERB staff and family members at the AERB day celebration**



On October 4, 2009, November 16, 2009 and November 18, 2009, three former stalwarts of AERB, Shri M.S.R.Sarma, the first Chairman of SARCOP, Shri P. N. Krishnamoorthy, the first Member-Secretary of AERB and Shri J.C.Shah, a former Member of the AERB Board and the former Chairman, Atomic Power Authority passed away. The tributes written by close associates of Shri M. S. R. Sarma, Shri P. N. Krishnamoorthy and Shri J. C. Shah are presented below.

### A TRIBUTE TO SHRI M. S. R. SARMA

With the passing away of Shri M.S.R. Sarma, we have lost a dedicated and sincere safety professional. He joined the Department of Atomic Energy in 1956 and was involved in the erection, commissioning and operation of the CIRUS reactor. After a 3 year deputation to Canada, he was the Station Superintendent for the Rajasthan Atomic Power Station (RAPS) from 1967 to 1984. He thus had an extensive and in-depth knowledge of the installation and operation of nuclear power reactors.



(Late) Shri M. S. R. Sarma  
(Aug. 26, 1931 - Oct. 4, 2009)

When Atomic Energy Regulatory Board (AERB) was constituted and the Safety Review Committee for Operating Plants (SARCOP) was created in 1988, he was its first Chairman till his retirement in 1991.

After he became the Chairman of SARCOP, there was a certain professional approach to the safety regulation. This was evident from some typical cases such as the extensive deliberations during the review of Narora Atomic Power Station (NAPS); the bifurcation of Technical Specifications of Tarapur Atomic Power Station (TAPS), Rajasthan Atomic Power Station (RAPS), and Madras Atomic Power Station (MAPS); preparation of Technical Specification for Fast Breeder Test Reactor (FBTR); the fuel handling incident in FBTR etc.

Sri Sarma was a field man. He believed that only by visiting the site and interacting with the people engaged in the work, a proper assessment could be made. So he was very particular on visiting the various facilities at least once a year. SARCOP used to meet every Wednesday and he put the safety regulation on a sound footing.

Apart from Reactor Safety, he laid equal emphasis on Radiation Protection and Industrial Safety. He started the Annual Safety Professionals Meet, which gave an opportunity to the Safety Officers of various units to meet and discuss the industrial safety aspects. This has become a regular feature now.

Even after his retirement he continued to be active. He was past President of the Indian Association for Radiation Protection (IARP) and past President of Indian Nuclear Society (INS).

After I took over as Chairman SARCOP on his retirement, he would visit me whenever he was in Mumbai. He was my friend, philosopher and guide. He gave me his sincere advice on many occasions-both professional and personal which were of immense benefit to me. As a person he was very affectionate and sociable. He loved to interact with people at all levels, from helper to Head of the unit. Though I came in contact with him much later in my career, he became very close to my family and me. He visited us many times at Bangalore after my retirement and was always an enjoyable company. My daughter used to say "Sarmaji wants his water very cold and his coffee very hot". It is sad that he is no more. He was like an elder brother to me and I miss him.

"MAY HIS SOUL REST IN PEACE "

- Shri S. V. Kumar, Formerly Vice-Chairman, AERB

### P. N. KRISHNAMOORTHY : A PIONEER IN RADIOLOGICAL PROTECTION

In the passing away of Shri. P. N. Krishnamoorthy, popularly known as "PNK", on November 16 this year, the country lost a pioneer in radiological protection and an able administrator.



(Late) Shri P. N. Krishnamoorthy  
(July 12, 1927 - Nov. 16, 2009)

PNK was born on 12<sup>th</sup> July 1927 and received his earlier education at B.E.T. High School, Rangoon. He took his B.Sc degree from the Government Victoria College, Palghat and joined Wilson College, Bombay in 1947 for his M.Sc. After obtaining his MSc. Degree, PNK joined TIFR.

In 1959, PNK took over Radiological Measurements Laboratory (RML), as its head to provide radiological protection services to institutions outside the Department of Atomic Energy (DAE). PNK led the Directorate of Radiation Protection (DRP) set up in 1963 to consolidate the radiation protection programme nationwide. The Radiation Protection Rules 1971 drafted by his team was the first piece of subordinate legislation under the Atomic Energy Act 1962. It reigned supreme till Atomic Energy (Radiation Protection) Rules, 2004 replaced it.

PNK served in IAEA in the Division of Health Safety and Waste Disposal and the WHO and ILO as a consultant. He represented India on the Board of Governors of the IAEA as Alternate Governor in 20 meetings. He co-authored the Health Physics Addendum (July 1960) with Mr. G J Appleton of the United Kingdom Atomic Energy Authority. This was the first Addendum to the Manual on Safe Handling of Radioisotopes, the first operational safety standard of the IAEA.

During 1964-66, he assisted Dr Homi Bhabha in the Scientific Advisory Committee to the Cabinet. PNK was associated with man power development and in upgrading of existing training programme. Later, he returned to BARC as its Controller and introduced several long lasting administrative measures.

PNK initiated the one year post graduate programme in radiological physics, recognized by the University of Bombay then, currently, known as Dip.R.P. This programme provides trained man-power to non DAE radiation installations nation-wide, the way BARC training school does for the Units of the DAE.

In 1983, he joined AERB as its Member Secretary and brought the first batch of officers who formed the core group to jumpstart the regulatory activities of AERB. "He served the Board with distinction during its formative years and contributed significantly in establishing robust and well laid out procedures to assist the nascent organization in to an effective regulatory body", Shri S K Sharma, Chairman, AERB acknowledged in a condolence message.

After his retirement in July 1987, PNK spent his entire life promoting music. He was Director of the Sangeetha Vidyalaya of

## TRIBUTES

Shanmukhanada Sabha since November 2002 and Honorary Editor of Shanmukha, the quarterly magazine of the Sabha.

PNK was among the handful of surviving stalwarts mentored by Homi Bhabha. His departure signifies the end of an era. Shri Krishnamoorthy is survived by his wife Smt. Bhagirathy, daughter Somya, son-in-law Krishnan Parameswaran and granddaughter Ramya.

- K. S. Parthasarathy,  
Raja Ramanna Fellow Department of Atomic Energy and  
Former Secretary, AERB

### A TRIBUTE TO SHRI J. C. SHAH

Shri J. C. Shah, former member of AERB Board passed away on November 18, 2009, just a month short of his 81<sup>st</sup> birthday.

Shri Shah joined the Department of Atomic Energy as Chairman & Chief Executive, Atomic Power Authority (APA). He was brought in to manage the Indian commercial nuclear power plants in a viable manner. At that time, both the TAPS units 1 and 2 had been declared commercial and were suffering from internal (equipment failure, operator errors, etc.) as well as external problems (constraints imposed on supply of fresh fuel, consumables and spare parts) which were resolved by Shri J.C.Shah in an exemplary manner. That testing experience



(Late) Shri J. C. Shah  
(Dec. 31, 1928 - Nov. 18, 2009)

equipped him for his subsequent roles in AERB and in Gujarat State Electricity Board as Chairman.

Shri Shah's association with AERB began around 1986, when he was appointed Chairman, ACNS after the demise of Shri Arumugham, its first Chairman. During his tenure, he was instrumental in reviewing and clearing the initial regulatory manuals and codes. He possessed a razor-sharp inquisitive mind that lay under his soft spoken behavior. He showed keen insights in review of these regulatory documents, enriching their quality in the process, to ensure that these documents were equitable and appropriate for their intended purposes.

Shri Shah joined AERB as a Board Member in 1987 and served upto 1990. He showed incisive skills in examining safety issues relating to nuclear power plant units. His meticulous preparation and his amazing grasp of complexities of safety issues that were brought before AERB, evoked admiration in the regulators and trepidation in the regulatees. He played a leading role in examinations of safety issues of NAPS and MAPS, and in their resolution in the Board meetings, in a fair and objective manner.

Shri Shah had been ailing for some months prior to his demise. He passed away peacefully, surrounded by his immediate family members.

I had a good fortune to work under the guidance of Shri J.C.Shah. I am deeply aggrieved by his demise.

- Shri S. P. Singh,  
Formerly Head, Nuclear Safety Division, AERB

## PRESS RELEASES

Wednesday, August 26, 2009

### Recovery of Industrial Radiography Device

On August 23, 2009 at about 9 PM, an industrial radiography device of a private radiography company fell from a moving vehicle during transportation from Pune to Mumbai by road, near Ambedkar Chowk, Pimpri. Atomic Energy Regulatory Board deputed a team of officials to the site of the incident and with the help of police, the device was recovered at about 6 pm on August 24, 2009. The device had been picked up by a group of youngsters and taken to a nearby village. The radioactive source in the device was found intact and inside its shielding and as such did not pose any radiation hazard.

Such devices are used for testing of metallic structures and welds. These devices contain radioactive source which is securely locked inside the shield. The source can be brought out only by trained personnel using special tools. These devices do not contain any explosive.

Sunday, November 29, 2009

### Incident of Tritium Uptake At Kaiga Generating Station

An incident of tritium uptake of some workers at the Kaiga Generating Station (KGS) occurred on November 24, 2009. This was noticed during the routine urine sample analysis of workers that is carried out regularly at all nuclear power plants that use heavy water. AERB deputed two of its officers to KGS who, along with the plant authorities, investigated the incident. There was no

heavy water leak in the plant and all plant systems were found to be functioning normal.

A drinking water cooler was found to be the source of this tritium contamination and this water cooler was isolated immediately. The tritium contamination was limited to only this water cooler and all other sources of drinking water were checked and found to be free of any such contamination. The water tank of this cooler, like all other water coolers, was kept locked. However, it appears that some mischief maker added a small quantity of tritiated heavy water to the cooler, possibly from a heavy water sampling vial, through its overflow tube. Further investigations are in progress in this regard.

All persons working in the plant were checked and personnel found to have received any tritium uptake were referred to the hospital for administration of diuretics (administration of diuretics accelerates the process of removal of tritium from the human body by urination). With this, now only two persons are having tritium in their body that can cause their extrapolated annual radiation exposure to marginally exceed the AERB specified limit of 30 millisievert (mSv). All other persons are back to their normal duties. However, even in the case of these two persons further medical management will bring down their potential radiation exposure to less than the AERB specified limit in a short time (The limit prescribed by the International Commission on Radiological Protection is 50 mSv per year, whereas AERB has prescribed a lower limit of 30 mSv per year as a matter of abundant caution).

AERB would like to assure everyone that the incident is well under control and there is no cause whatsoever for any radiation safety concern.

### REORGANIZATION OF RADIOLOGICAL SAFETY FUNCTIONS IN INDIAN NUCLEAR POWER PLANTS

**S. N. Rao, P. S. Nair and V. Mohan**

Operating Plant Safety Division, AERB

#### Introduction

The objective of radiation protection measures in Nuclear Power Plants (NPPs) is to protect the occupational workers, members of the public and the environment from the adverse effects of radiation while allowing the justified activities for societal benefit. The radiation protection standards recommended by International Commission on Radiation Protection (ICRP) form the basis of laying down radiation safety standards. As on today all the NPPs in the country are owned and operated by Nuclear Power Corporation of India Ltd (NPCIL), a public sector enterprise. Supervision of the radiological safety functions in Indian NPPs have been so far under the control of Health Physics Division (HPD) of BARC, independent of NPCIL. Recently, the Radiological Safety functions at NPPs was organised by transferring the functions of the health physics unit in NPPs from BARC to NPCIL. In this backdrop, the programme and the methodology followed by AERB in enforcing regulations to ensure radiological safety of occupational workers and the public are discussed hereunder.

#### Radiation Protection Functions – Previous Organization set up

The Radiation Protection Group namely the Health Physics Unit (HPU), has been functionally reporting to the Health Physics Division of BARC. The HPU provided Radiation Protection Surveillance and Service functions, as per the stipulations of the Atomic Energy Regulatory Board (AERB) performing advisory, monitoring and regulatory role in all aspects of radiation protection at the Station. The HPD, BARC provided regulatory support to AERB in administration of radiological safety in NPPs.

Broadly, the HPU at the NPPs was responsible for;

- (i) Providing radiological safety services such as;
  - Routine and special radiological monitoring in and around the plant premise
  - Personnel monitoring for radiation dose assessment and control
  - Effluent monitoring for radioactive discharges from the plant
  - Recommending appropriate protective measures for radiation exposure control and,
  - Imparting radiation protection training to plant personnel
- (ii) Radiological safety surveillance function consisting of identifying, analyzing and reporting of;
  - Unsafe radiological conditions and practices,
  - Radiological events,
  - Deviations from regulatory requirements and license conditions.

The surveillance function is advisory in nature where the Health

Physicist advises the plant management on requirement of appropriate safety actions.

The periodic reports issued by HPU through HPD of BARC contain detailed radiological information related to the NPP operation and maintenance including data on personnel radiation exposure, radioactive effluent releases, radiological condition of the plant, unusual occurrences and special observations of radiological significance, status of radiation measuring instruments, emergency preparedness, training and annual medical examination of occupational workers. These periodic reports were discussed in multi-tier review process of AERB for necessary regulations and enforcement.

The liaison between HPD and the AERB in review and enforcement of radiological safety requirements played an important role in improving the radiation safety culture at the operating NPPs. At all NPPs, the environmental monitoring carried out by the Environmental Survey Labs is also functioning under HPD, BARC. This helps in independent monitoring of the radiological safety status in public domain.

The Regulations on radiation protection practices are derived from;

- Legislative frame work provided by the Atomic Energy Act 1962,
- Legal frame work provided by the Atomic Energy (Radiation Protection) Rules, 2004 (RPR 2004) and
- Regulatory frame work provided by the Safety Documents issued by AERB from time to time.

Under Atomic Energy Act 1962, the AERB is entrusted with the responsibility to ensure the radiological safety of all nuclear power plants and radiation handling facilities in the country. Supervising the Radiological Safety functions in Indian NPPs have been under the control of Health Physics Division (HPD) of BARC since the inception of the Nuclear Power programme in the country. This resulted in generation of a significant experience in radiation protection programme in NPPs. World over; the Radiological Safety functions and the Health Physics Unit are under the Plant Management of the NPPs. This is because the Plant management is primarily responsible for nuclear and radiological safety in NPPs. Based on the good track record of radiation safety in Indian NPPs and to be in line with the international practices in radiological safety, and after a comprehensive discussion between AERB, BARC and NPCIL, it was decided to transfer the health physics functions from BARC to NPCIL.

#### Re-organization of Radiological Safety functions

In the revised organizational plan, all the HPU staff of NPCIL working at NPPs would report to the Safety Directorate of the Responsible Organization (NPCIL-HQ). Since the plant management is primarily responsible for the radiological safety at NPPs and the HPU will report to the Safety Directorate at NPCIL Head Quarters, the independence of HPU from the plant management will be ensured.

Radiological Safety Officers at NPPs designated by the  
*contd. to Page No. 12*

### Personnel Joined (July – December 2009)

S.N.	Name & Designation	Date of appointment
1.	Shri J. Christopher, SO(C)	03/08/2009
2.	Shri Wani Prasad, SO(C)	10/08/2009
3.	Shri Anirban Guin, SO(C)	01/09/2009
4.	Shri Lalit Mohan Sharma, SO(C)	01/09/2009
5.	Shri Rahul Shukla, SO(C)	01/09/2009
6.	Shri Phani Karthik, SO(C)	01/09/2009
7.	Shri Anand R.Pinjarkar, SO(C)	24/12/2009

### Personnel Retired (July – December 2009)

S.N.	Name & Designation	Date of retirement
1.	Shri S.P. Agarwal, SO(H)	31/08/2009
2.	Shri R.Kannan, SO(F)	31/10/2009



Shri S. A. Hussain,  
Head, Radiological  
Safety Division, AERB

### New Head, RSD

Shri S. A. Hussain has taken over as Head, Radiological Safety Division, AERB after superannuation of Shri S. P. Agarwal, Head, Radiological Safety Division on August 31, 2009.

contd. from Page No. 11

Competent Authority (Chairman, AERB) are responsible for reporting the Radiological safety aspects to AERB. The environmental survey programme continues to be under the HPD of BARC for independent monitoring of radiological safety status in the public domain. Periodic safety review and regulatory inspections of NPPs will continue to be conducted by AERB.

### Regulatory Framework

“Radiological Safety Officers” (RSO) have been designated in each NPP under the provisions of Atomic Energy Act 1962, Radiation Protection Rules, 2004 and Atomic Energy Rules (Safe Disposal of Radioactive Wastes) Rules, 1987. RSO is a legal entity who in the opinion of the Competent Authority (Chairman, AERB) is qualified to discharge the duties and functions outlined in these rules. AERB initiated action to strengthen the institution of radiation protection in NPPs by designating the Radiological Safety Officers (RSO) who are currently the Station Health Physicists, and also an alternate RSO. The duties and responsibilities of these RSOs are stated in RPR 2004. In the event of any abnormal incident involving radiation source/exposure, the RSO, is required to inform immediately the employer and the AERB the details of the incident, remedial measures initiated and programme for disposal of contaminated material, etc.

To realize the above objectives, the regulatory framework includes a detailed set of radiation protection standards/ authorized limits and reporting criteria. Over and above these limits, AERB has introduced additional check points to minimize the radiological impact on personnel, public and the environment based on As Low As Reasonably Achievable (ALARA) principle.

With the arrangement described above, the radiological

safety functions at NPPs will continue to be as robust as it was earlier. Further, AERB will be able to effectively monitor and regulate the radiation protection programmes and practices at NPPs towards ensuring the radiation exposure of personnel and radioactive releases to the environment are well within the prescribed limits and ALARA.

### AWARDS & HONOURS



Dr. R. D. Lele

Dr. R. D. Lele, Former Member AERB Board and Shri S. K. Mehta, Former Director, Reactor Group, BARC and Consultant to AERB were honoured with Indian Nuclear Society (INS) Homi Bhabha Lifetime Achievement Award.



Shri S. K. Mehta

Shri A. R. Sundararajan, Former Director, Radiological Safety Division, AERB received INS Award for Radiation and Radioisotopes related Technologies and their Applications in different areas including Medicine, Agriculture and Industries.



Shri A. R.  
Sundararajan

Shri Utkarsh Chikkannagoudar of Nuclear Projects Safety Division, AERB was presented with INS Medal.



Shri Utkarsh  
Chikkannagoudar

The awards were conferred by INS during their Annual Conference (INSAC-2009) on January 4, 2010 at Chennai.

### Editor

Dr. R. M. Nehru, nehru@aerb.gov.in

### Editorial Committee

Shri R. P. Gupta, Shri V. Mohan, Smt. Manisha Inamdar,  
Shri Soumen Sinha and Shri K. Ravi

Materials published in AERB newsletter may be reprinted or translated freely with due acknowledgement. If the author of an article is not from AERB staff, permission to publish except for reviewing must be sought from the author or originating organisation. Articles or materials in the Newsletter do not necessarily represent the views or policies of the Atomic Energy Regulatory Board.

Edited and published by Dr. Om Pal Singh, Secretary, Atomic Energy Regulatory Board, Niyamak Bhavan, Anushaktinagar, Mumbai-400 094.

Tel. & Fax No.: 25576255, Res. No.: 25568447, E-mail: ompal@aerb.gov.in

Designed, Processed & Printed by Printania Offset Pvt. Ltd., Ph. : 24078866/7996.