N.8: Honours and Awards:

H.1: DAE Excellence in Science, Engineering & Technology Awards 2015:

The Department of Atomic Energy has instituted the Excellence in Science, Engineering & Technology Awards Scheme from the year 2006 to recognize outstanding accomplishments and exceptional achievements of the DAE staff, who are engaged in scientific research, technology development, engineering/project implementation, teaching, health care, and supporting services. There are ten categories of awards under the scheme and one Meritorious Service Award for Auxiliary, Administration, Accounts services etc. These awards are given annually. The awards for the year 2015 were given on the Founder's Day on October 28, 2016 in BARC. The following scientists/engineers bagged the DAE awards for the year 2015.

H.1.1: Scientific and Technical Excellence Award:

1. Dr. Akhilesh Jain, SO/G, Radio Frequency Systems Division has been conferred the "Scientific and Technical Excellence Award for the year 2015" for his contributions in the field of "Technology Development of High Power Solid-State Radio frequency Amplifier for Particle Accelerator". He has done excellent work for the technology development, and commissioning of 225 kW, 505.8 MHz solid-state radio frequency amplifiers for Indus-2 Synchrotron Radiation Source. With the support of these amplifiers, Indus-2 beam current could be increased to more than 200 mA at 2.5 GeV. Being a state-of-the-art technology, this development has added RRCAT's name in the list of very few particle accelerator laboratories around the world, which are using solid-state RF amplifiers for acceleration of charged particles. He has made praiseworthy contribution in the development of 30 kW, 650 MHz modular and scalable solid-state amplifier for Proton accelerator programme. This technology development has profound impact in furtherance of knowledge and on improved design of powerful RF sources. The award carried a cash prize of ₹ 1 Lakh a Citation and a Medal.

2. Shri S. C. Vishwakarma, SO/E, Solid State Laser Division has been conferred the "Scientific and Technical Excellence Award for the year 2015" for his excellent contributions in the area of "Opto-mechanical design, development, and in-situ deployment of high power Nd:YAG lasers and tooling in different units of Department of Atomic Energy along with opto-mechanical design of lasers for defence and medical applications". Some of his notable features are the development of laser cutting tool for water-jet assisted under water cutting of DHRUVA fuel tubes. Development of manipulators for in-situ laser cutting of bellow libs, high pressure feeder, coupling studs and shock absorber studs deployed at NAPS-1, NAPS-2 and KAPS-1. Shri Viswakarma designed and developed highly efficient laser pump cavities, stable laser resonator structures and opto-mechanical components for up to 1 kW pulsed industrial Nd:YAG lasers, which were also used in missile firing system of T-90 tank. His work had a significant impact in the refurbishing and maintenance of nuclear power plants and has resulted in tremendous reduction in time, cost and MANREM exposure to the personnel. The contribution by Shri S. C. Viswakarma in design, development and deployment of various lasers and fixtures for laser applications in Indian Nuclear Programme has been highly fruitful that has contributed to the excellent gains to the DAE. The award carried a cash prize of ₹ 1 Lakh a Citation and a Medal.

H.1.2: Meritorious Technical Support Award:

The award carries a cash award of ₹ 20,000/-, a Citation and a Medal. There are four award winners from RRCAT:

1. Shri K. G. Vaishnav, F/B, Proton Linac and Superconducting Cavity Division has been awarded the "Meritorious Technical Support Award for the year 2015". Shri K G Vaishnav has contributed for indigenous development of Superconducting RF cavities and provided excellent technical support in special precision rolling of beam pipes, various welding and machining fixtures for Electron Beam Welding of high RRR niobium cavities. The SCRF cavities fabricated with the technical support of Shri K G

Vaishnav have been successfully tested to achieve rated performance of accelerating gradients Eacc > 35 MV/m with high quality factor $Q_o > 1 \times 10^{10}$. Successful fabrication and testing of SCRF cavities is an important mile stone in SCRF cavity technology development as large number of SCRF cavities would be required in DAE's future accelerator projects.

2. Shri Basant Kumar Saini, Foreman/B, Laser Development and Industrial Applications Division has been conferred "Meritorious Technical Support Award for the year 2015" for his contributions in field of fabrication, assembly, and testing of opto-mechanical components and participation in on-site implementation of laser cutting/welding in radioactive environment. Shri B.K. Saini is actively involved in fabrication, fitting work and assembly of opto-mechanical components of high power Nd:YAG laser systems, chiller units and special tools/fixtures as well as on-site execution of laser based refurbishing and maintenance work in different Units of DAE and nuclear power plants. The timely delivery and installation of about 20 laser systems at various units of DAE became possible due to his support and intense efforts. His work has also been highly fruitful in laser cutting of bellow lips during en-masse coolant channel replacement and maintenance work in nuclear power plants, which lead to significant reduction in time, radiation dose consumption and cost for such applications. The mechanical skills, knowledge of Shri Saini as well as his hard work, dedication, and sincere effort for various jobs assigned to him makes him indispensable as a team member.

3. Smt. Vanshree Thakur, SA/F, Accelerator Magnet Technology Division has been awarded the "Meritorious Technical Support Award for the year 2015" in recognition of her outstanding contribution in the field of Magnet design and Technology for Indus Accelerators. She has designed, developed and measured various magnets for national synchrotron radiation facilities – Indus-1 (450 MeV) & Indus-2 (2.5 GeV) and mass spectrometers at BARC. Her expertise in field of magnet design and development is reflected in successful round the clock operation of Indus-1 and Indus-2 storage rings. Her efforts have played a key role in achieving major milestones for the Accelerator Programme at RRCAT. She has also designed a combined function magnet (harmonic sextupole, quadrupole and dipole components) for Indus-2 required for the improvement of the dynamic aperture, reduction in the coupling between two transverse degrees of freedom and steering of the electron beam. The limitation in space (magnet and power cable size) in the ring made the design work of this magnet very challenging. Based on her design, a prototype magnet has been developed and the measured results are accepted by the beam dynamics group. After the successful qualification of the prototype, series fabrication of 32 magnets have been taken up. She has developed the expertise to design the accelerator magnets using magnet design codes like OPERA-3d, POISSON -2d etc. Her expertise in virtual prototyping of magnet in OPERA-3d code resulted into a very little correction or no correction at all in actual prototyping. This amounts of considerable time saving in overall magnet manufacturing. The design also takes care of current available reliable techniques of magnet manufacturing so that the magnet to magnet variation in one type of magnet group lies with acceptable limit. Apart from storage ring magnets, she has also carried out the design and characterization of the bending magnets and steering magnets of other important projects like IRFEL and proton Linac. The measured field errors of these magnets are also found within the design limit.

4. Shri Samiran Sarkar, Foreman/C, Ultra High Vacuum Technology Section has been awarded with "Meritorious Technical Support Award for the year 2015" for his excellent contributions to the "Development of Ultra High Vacuum Components for Indus Accelerators". Shri Samiran Sarkar assembled and tested UHV components cooling system assembly for Indus-2 and participated in their installations. Some of them are Photon absorbers, water cooled flanges and SR beam slit assembly. He had assembled and vacuum qualified several peripheral components for the Undulators U1, U2 and APPLE-2. The important components are Taper chambers, IDBPIs and RF Shielded bellows with Beryllium Copper fingers. He

participated in their assembly in Indus-2. He also contributed in the fabrication, assembly and qualification of Septum Chamber and its integration in Indus-2 ring. He also contributed in 300 Tons Magnet assembly and coil winding for MHD project, vacuum assembly and testing of 750 kV DC accelerator and rotating anode x-ray generator. He had developed several fixtures for tensile and compression tests of various types of brazed joints.

H.1.3: Meritorious Service Award:

The award carries a cash award of ₹ 20,000/-, a Citation and a Medal. There are two award winners from RRCAT:

1. Shri T. Kalaichelvan, Stores Officer, Indore Regional Purchase & Stores, Unit, RRCAT has been awarded the "Meritorious Service Award for the year 2015" in recognition of his excellent contribution in the field of "Materials Management with Specialization in Stores Activities". Shri Kalaichelvan has provided excellent materials management services to fulfil timely requirement for the various R&D activities of RRCAT. He has contributed in making the RRCAT campus neat and clean by arranging for timely collection and disposal of unserviceable equipments and scrap items. He has ensured safe handling of high value and heavy equipments during their unloading, shifting and positioning in laboratories and has assured uninterrupted supply and refilling of industrial gases which helped the Centre in timely execution of crucial projects.

2. Shri Chandrasen Bansiwal, Senior Work Assistant "A", Indus Operations, Beam Dynamics and Diagnostics Division, RRCAT is conferred the "Meritorious Service Award for the year 2015" for his excellent contributions in the field of "exemplary site-support to the activities of Indus projects". Shri Chandrasen Bansiwal has made laudable contribution to site activities of Indus accelerators and beamlines, which is a national synchrotron facility, with his excellent ability to complete all the assigned works and perform duties uninterrupted for long hours. He has immensely contributed to various important jobs on several occasions, and provided crucial site support to the works from various divisions involved in building, installing, commissioning and operating Indus accelerators and beamlines.

H.1.4: Group Achievement Awards:

The award carries a Medal, a Citation and suitable cash awards for each group commensurate with the group size and its overall achievement. The following groups of RRCAT received the "Group Achievement Award" for the year 2015:

1. A group comprising of 101 members (60 from RRCAT and 41 from BARC) has been conferred the "Group achievement award for the year 2015" for their contribution in the project titled "*Design, development, installation commissioning of new infrared beamline at Indus-1 and utilization of 15 bending magnet based beamlines on Indus-1 and Indus-2*". On behalf of the RRCAT group, the award was received by its group leader, **Dr. P. A. Naik**, DS, Director, RRCAT.

2. A group comprising of 24 members from RRCAT has been awarded the "Group Achievement Award" for the year 2015 for its contribution on the *"Development of a tuning machine for 1.3 GHz nine-cell superconductivity RF cavity"*. On behalf of the group, the award was received by **Shri S. C. Joshi**, OS & Head, PLSCD, RRCAT.

3. A group, consisting of 15 members from RRCAT has been awarded the "Group Achievement Award" for the year 2015 for its contributions in the field of *"Design and development of laser additive manufacturing system for engineering and prosthetic applications"*. The award was

received by the group leader, **Dr. Christ Prakash Paul**, SO/G, LMPD on behalf of the group.

4. A group, consisting of 602 members from BARC and **Shri Pravin Sharma** of RRCAT, has been awarded the "Group Achievement Award" for the year 2015 for its contributions in the field of "*Sustained Operation of Dhruva Reactor at Rated Power*".

H.2: Best Poster Awards:

H.2.1: Ms. Dipanjana Hazra, HBNI Ph.D. scholar (external) working in Laser Plasma Section (LPS) on laser wakefield electron acceleration under the supervision of Dr. Anand Moorti, SO/G, LPS, won "Best Poster Award" in the 7th Asian Summer School and Symposium on Laser Plasma Acceleration and Radiation held at Shanghai Jiao Tong University, Shanghai, China, during 17-23 July, 2016. The award carries a certificate and a cash prize of Yuan 500. The details of the poster paper is given below:

Title: "*Quasi-monoenergetic electron beam generation by betatron resonance acceleration and SM-LWFA with ionization induced injection*"

Authors: D. Hazra, A. Moorti, B. S. Rao, J. A. Chakera, P. A. Naik and P. D. Gupta.

H.2.2: Three papers of RRCAT were selected for the Best Poster Awards of Indian Laser Association (ILA) during the DAE-BRNS National Laser Symposium-25 (NLS-25), held at Department of Physics, School of Applied Sciences, KIIT University, Bhubaneshwar during 20-23 Dec. 2016. The award carries a cash prize of ₹ 2500/- and a Citation. The details of the poster papers are given below:

1. The poster paper, titled "*Development of a liquid-crystal tunable filter based hyper-spectral imaging system and a software interface for automated acquisition and analysis of spectral images*", authored by ***Hemant Krishna*** *and Shovan K. Majumder* received a Best Poster Award at NLS-25.

2. The poster paper, titled "*Development of in-situ laser cutting technique for removal of single selected coolant channel from pressurized heavy water reactor*" authored by ***S. C. Viswakarma****, B. N. Upadhyaya, D. N. Sanyal, Rajpal Singh, B. K. Saini, R. K. Jain, D. K. Agarwal, Amber Choubey, Sabir Ali, M. K. Bairwa, S. K. Sah, A. A. Raju, Manoj Kumar, V. Bhawsar, R. Arya, R. R. Barot, S. K. Deshmukh, S. F. Vhora and K. S. Bindra* received a Best Poster Award at NLS-25.

3. The poster paper, titled "*Development of all solid state RF powered 2 kW fast axial flow CO2 laser system",* authored by ***M. S. Bhagat****, L. B. Rana, A. K. Biswas, B. S. Rawat, Jagdeesh, Manoj Kumar, Rajiv Yadav, R. Kaul, and B. Singh* received a Best Poster Award at NLS-25.

H.3: Venus Wires Award-2016:

The Indian Institute of Welding (a member society of the International Institute of Welding), awarded the Best Technical Paper on Stainless Steel Applications to the following paper from RRCAT during the inaugural ceremony of the National Welding Seminar – 2016, held at the Science City Auditorium, Kolkata on 15th December, 2016. The paper was presented during the National Welding Seminar (NWS-2015) held at CIDCO Exhibition Centre, Navi Mumbai between 9-11th December, 2015. The award carries a cash prize of ₹ 10,000/- and a Citation. **Dr. P. Ganesh,** SO/G, Laser Materials Processing Division, who presented the paper, received the award. The details of the poster papers are given below:

Title: "*Development of Vacuum Brazed Niobium-316L Stainless Steel Transition Joints for Superconducting Cavities*"

Authors: Abhay Kumar, P. Ganesh, Rakesh Kual, P. Ram Sankar, B. K. Sindal, D. P. Yadav, V. K. Bhatnagar, K. Yedle, Ram Kishor Gupta, Sanjay Sharma, S. D. Sharma, Rakesh Kumar Gupta, R. Sridhar, G. Mundra, S. C. Joshi and L. M. Kukreja.

H.4: Award of Doctor of Philosophy (Ph.D.) Degrees:

The **Homi Bhabha National Institute (HBNI)**, a Deemed University has awarded Ph. D. Degrees to following research scholars for work carried out in RRCAT:

1. Dr. Harishchandra Singh of Homi Bhabha National Institute (HBNI) has been awarded Doctor of Philosophy in Physical Sciences on the dissertation, titled "*Structural and Spectroscopic studies of transition metal based Multiferroics and Oxides*", which was supervised by Dr. A. K. Sinha, Head, Hard X-ray Applications Lab. Synchrotrons Utilization Section.

2. Dr. Ekta Rani of Homi Bhabha National Institute (HBNI) has been awarded Doctor of Philosophy in Physical Sciences on the dissertation, titled "*Study of Semiconductor Nanocomposites using Raman and AFM Mapping*", which was supervised by Dr. Alka Ingale, Head, Raman Spectroscopy Lab., Laser Physics Applications Section.

3. Dr. Amit Kumar Das of Laser Materials Processing Division has been awarded Doctor of Philosophy in Physical Sciences on the dissertation, titled "*Effects of disorder on electrical and optical properties of doped ZnO thin films grown by pulsed laser deposition*", which was supervised by Dr. L. M. Kukreja, Head, Laser Materials Processing Division.

N.9: Superannuations:

The family of RRCAT wishes happy and healthy post retirement life to its following colleagues.

S.1: Dr. P.D. Gupta, Distinguished Scientist, & Director RRCAT, laid down his office on 31st July 2016 on superannuation after completion of an illustrious scientific career of 43 years in the Department of Atomic Energy. He received B.Sc. and M.Sc. degrees from Punjab University, Chandigarh, securing Gold Medals. Dr. Gupta had joined Bhabha Atomic Research Centre, Mumbai in August 1973 after graduating from 16th batch of BARC Training School, where he secured First rank amongst trainees of all disciplines and was awarded Homi Bhabha Gold Medal and Prize. He received his Ph.D. in the field of laser plasma interaction from Mumbai University in 1984 and did his post-doctoral work at the Department of Electrical Engineering, University of Alberta, Canada during 1984-86. In 1990, Dr. Gupta moved from BARC to RRCAT, where he set-up an ultra-intense laser plasma interaction laboratory of international standards. He has scientifically contributed in the fields of laser plasma interaction, laser driven particle acceleration, coherent x-ray generation, ultrashort pulse table-top terrawatt lasers, high power Nd:glass laser, ultrafast optical and x-ray diagnostic systems, capillary discharge plasma, etc. Dr. Gupta is an internationally known laser-plasma physicist. He is a Fellow of National Academy of Sciences, India. RRCAT family wishes him and his family a fruitful, happy and fulfilling life ahead.

S.2: Dr. P. K. Gupta, Distinguished Scientist, & Acting Director RRCAT, laid down his office on 31st August 2016 on superannuation after completion of a meritorious scientific career of 42 years in the Department of Atomic Energy. With a bright academic