

## Setting up of Homi Bhabha National Institute



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### **The Beginning**

The nuclear power programme in India started with the setting up of boiling water reactors at Tarapur, near Mumbai, by a US company on turnkey basis. In parallel, decision to construct pressurized heavy water reactors, in collaboration with Canada, was taken. International cooperation ended abruptly after peaceful nuclear explosion conducted by India in May 1974. Since then and until recently India had been following an autarchic path for the development of nuclear power. Considering its nuclear fuel resource position and large energy needs, India has decided to pursue a closed fuel cycle, which can enable exploiting full energy potential of uranium and makes it possible to exploit plentiful thorium for energy generation. While the situation about international cooperation changed in favour of India in the year 2008 [1, 2], not many countries are pursuing a closed fuel cycle approach and India has to pursue this path based on innovations within India.

Innovation needs inputs at all levels: research, technology development and technology deployment. The Department of Atomic Energy (DAE) has set up a network of institutions to implement all levels and is well poised to increase installed nuclear capacity based on existing as well as innovative technologies. All institutions in the DAE pursuing research and development need to work synergistically to accelerate the pace of implementing innovations and this called for devising an enabling framework.

DAE institutions have been running academic programmes, particularly doctoral programmes, since their inception. For the award of academic degrees, they were affiliated to various universities in the country, an arrangement not considered satisfactory. Bureaucratic approach common in the university system frustrates any attempt to improve quality or introduce innovations. Doctoral research has twin objectives: training a student in doing research, and doing research. By choosing topics for doctoral research related to the mission of the Department, a lot can be achieved as a thesis documents - four man-years of research by a bright young graduate student. This motivated the Department to set up a university that can help in the growth of doctoral research, provide for joint guidance of students from within and across DAE institutions, and improve training of the student and the quality of doctoral research. Such an idea was first mooted

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during a seminar held in 1995<sup>2</sup>, but it did not gain traction. Discussion on this idea resurfaced in the year 2002 and was endorsed by various bodies within the Department including DAE Science Research Council<sup>3</sup>, an advisory body consisting of eminent scientists set up in 2001 to advise the DAE in identifying thrust areas to be taken up for research, upgrade the level of ongoing research and other similar aspects. It was also endorsed by the Chairman's Advisory Committee<sup>4</sup>.

For the course based programmes, as run in the BARC Training Schools, it was not possible to award any degree and the programme was being run as a non-formal programme<sup>5</sup>. The programme at the Training School has evolved as equivalent to the course work for a M.Tech., and the Training School has been functioning like a Graduate School of any university. Converting the non-formal academic programme at the Training School into a formal programme called for setting up or affiliation with a university. In addition, Tata Memorial Centre (TMC) was running post-graduate programmes in medicine, but the scope (spread in terms of specialization, as well as number of students admitted) of the programme was much narrower than the potential of TMC.

With this background, in April 2003 Dr. Anil Kakodkar, the then Secretary, DAE constituted a steering committee to advise the Department on all aspects of setting up of Homi Bhabha National Institute (HBNI) as a deemed to be university. This enabled the Department to get advice from eminent educationists like Prof P. Rama Rao and Prof. S. P. Sukhatme. The author was the member-secretary of the steering committee.

## **Accreditation**

### **The proposal from the DAE**

Tata Institute of Fundamental Research (TIFR) could get the status of a deemed to be university in the year 2002 based on independent efforts. It was, therefore, decided to include under HBNI only the following ten institutions.

#### Research and Development Centres

- a. Bhabha Atomic Research Centre (BARC), Mumbai;
- b. Indira Gandhi Centre for Atomic Research (IGCAR), Kalpakkam;
- c. Raja Ramanna Centre for Advanced Technology (RRCAT), Indore;
- d. Variable Energy Cyclotron Centre (VECC), Kolkata;

#### Grant-in Aid Institutions

- e. Saha Institute of Nuclear Physics (SINP), Kolkata;
- f. Institute for Plasma Research (IPR), Gandhinagar;

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<sup>2</sup> A seminar to discuss Vision 2020 of the DAE was organised during July 17 – 21, 1995 in BARC. During the session, titled DAE – Universities Interaction, a proposal to set up a deemed University with constituent units and grant-in-aid centres of the DAE forming campuses of the university.

<sup>3</sup> The idea of setting up a university level institute was strongly supported by the DAE Science Research Council in a meeting held on January 26, 2003.

<sup>4</sup> Chairman's Advisory Committee is chaired by the Secretary, DAE and senior officers of DAE are members. It endorsed the setting up HBNI in a meeting held on February 15, 2003. In its meeting held on April 9, 2004, it emphasized that doctoral research should be on topics of interest to the mandate of the Department.

<sup>5</sup> Learning can be formal, non-formal or informal. Learning provided by an accredited educational institution and leading to certification is formal learning. Formal learning is intentional from the perspective of a learner and is structured. Learning from daily life activities related to work, family or leisure of an individual is informal learning. Non-formal learning is not provided by an accredited institution and doesn't lead to certification. It is, however, structured and from learner's perspective, it is also intentional.

- g. Institute of Physics (IoP), Bhubaneswar;
- h. Harish-Chandra Research Institute (HRI), Allahabad;
- i. Tata Memorial Centre (TMC), Mumbai; and
- j. Institute of Mathematical Science (IMSc.), Chennai

All the above institutions formally concurred with the idea of setting up of HBNI. Pending details, 'in principle' approval of the Atomic Energy Commission was taken in July 2003. After working out all details in accordance with guidelines for deemed to be universities issued by the University Grants Commission (UGC) in the year 2000, the proposal was submitted by the Secretary, DAE to the Ministry of Human Resource Development (MHRD) and the UGC in January 2004.

A Council of Management was constituted vide an office order dated November 18, 2004 and HBNI was registered as a Society. The Office Order designated the author as the Director and Dr. R.R. Puri was designated as the Dean.

### **The review by the UGC for accreditation**

The UGC appointed a committee chaired by Prof S. K. Joshi for screening all proposals received by them. Among others, the Committee included Prof B. S. Sonde, Prof P. N. Tandon and Prof M. Anandakrishnan as members. Based on a presentation by HBNI on November 22, 2004, the committee recommended our case for a visit by an expert committee subject to our fulfilling certain conditions. Conditions not being onerous, we decided to take further steps including having first meeting of the Academic Council on January 7, 2005. Boards of Studies were constituted, academic programmes to be launched were finalized, and the presentation to be made to the Expert Committee to be set up by the UGC was discussed.

The UGC constituted an Expert Committee under the chairmanship of Prof. S.K. Joshi with Prof. G.K. Mehta, Dr. Harinarayana Kota, Dr. N. Rudraiah, Prof. G. Sundarajan as members and Dr. (Mrs.) Pankaj Mittal as Member-Secretary. The committee visited HBNI during March 28-29, 2005 and recommended grant of deemed to be university status to HBNI with ten constituent units. The recommendations of the Expert Committee were accepted by the UGC in its meeting held on April 1, 2005 and were later approved by the MHRD. A notification declaring HBNI as a deemed to be university along with ten constituent units was issued by the MHRD on June 3, 2005.

### **Early years**

All ongoing academic programmes, which were accredited with various universities were approved and it was decided to accredit non-formal programme at BARC Training Schools as course work for an M.Tech. from HBNI. To complete an M.Tech., one-year project work was added to the course work as per the norms of All India Council of Technical Education. It was also decided that there should be student-specific doctoral committees for every doctoral student to maintain academic standards. Appropriate course work and an oral general comprehensive examination were also made compulsory for doctoral students. Ordinances for all academic programmes were written after due deliberations.

### **Faculty**

The concept of HBNI mandated that the scientific staff working in various units would work as faculty. A framework for recognizing scientific staff as faculty was evolved. It provided for recognizing only those who have a Ph.D. and enough good publications. In case of institutions

like SINP, IoP, HRI and IMSc, individuals are recruited and progress through career as faculty and therefore, all were recognized as faculty. In case of medical doctors, it meant following the norms of Medical Council of India and this was the case regarding TMC. In the case of R&D centres, individuals are recruited as scientific officers after a rigorous selection process including an all India screening test and an interview, but only some go on to pursue doctoral research. As a result, only a small percentage (less than 10% of the total<sup>6</sup>) qualified as faculty. In case of IPR, the situation is mixed with some recruited as faculty and some as scientific officers. It was challenging to designate only a small percentage as faculty and several senior colleagues expressed gentle resentment. After all they had also joined DAE institutions after a rigorous selection process and many possessed in-depth knowledge in their subject of specialization. To gain from in-depth knowledge of such individuals, concept of ‘Technology Adviser’ for doctoral and masters’ students was introduced. Select individuals were designated as Technology Advisers and this became a win-win situation; students benefited from their advice and such advisers became involved in the process of building HBNI.

### **Setting up a Central office**

A Central Office of HBNI was established and all institutions were requested to set up a university cell. Getting administrative manpower to run the Central Office was a challenge. With no comparable model in the country, all had difficulty in visualizing manpower requirements. We started with a small complement of staff and added staff as clarity emerged. Still staff is less than optimum and request by HBNI for creation of additional posts is being processed.

### **External reviews after accreditation**

#### **Review by the UGC**

The UGC requested for a review of HBNI in October 2009 by a seven-member expert committee under the chairmanship of Prof J. V. Narlikar. The Committee met for the first time in Mumbai on January 12, 2010 and after visiting some of the units met again during April 1-2, 2010 when representatives of the constituent units were present.

Acknowledging the special character of HBNI, the Committee observed, “HBNI is a unique research-oriented university and therefore, it should not be viewed in the same way as a standard teaching cum research university.” Commenting on research facilities, the Committee said that HBNI has excellent experimental facilities in areas like materials, reactor design and operations, and lasers, which are unique in the country. With regard to theoretical research in areas like plasma, reactor, accelerator and high energy physics, and pure mathematics, the Committee observed that “it is of very high standard when judged against the national background.” Continuing, the Committee noted, “The research work related to technological aspects is of very high quality.” The Committee was impressed by the expeditious evaluation of theses and the efficiency of general administration. The committee observed that “HBNI is well expected to fulfill its vision of carrying cutting edge science and technology to large number of students.”

#### **Review by the MHRD**

By the middle of 2009, 128 institutions had been declared as deemed to be universities and MHRD issued a notification constituting a committee to review the functioning of all deemed to be

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<sup>6</sup> Total includes those who join as scientific assistant and are promoted based on years of service or on the basis of acquiring higher qualification.

universities with the objective of examining academic standards. The Review Committee had four members namely Prof P N Tandon, Prof Goverdhan Mehta, Prof Anandakrishnan and Prof Mrinal Miri and it based its evaluation on a set of nine parameters. The first parameter was “Considerations of the idea of a university” and this is a parameter having multiple viewpoints. It has been extensively debated and is discussed in detail in a later section. Inclusion of this parameter was a challenge to the approach followed by the expert committees who had earlier recommended to the UGC bestowing the status of deemed to be universities on various institutions. The second parameter was “Whether all their present academic activities/ programmes could have been carried out without being a deemed university; how the status of deemed university became a stimulus for better performance.” This has two parts and the first part was also a challenge to the work done by the previous expert committees set up by the UGC. The remaining parameters were all non-controversial.

We submitted a report and interacted with the Review Committee on September 19, 2009. The Review Committee graded universities in three categories namely A, B and C [3]. HBNI was placed in the category ‘B’, which meant that some corrective measures are needed. For the first parameter, namely “Considerations of the idea of a university”, HBNI was assigned zero marks. For most other parameters, HBNI was given 3 out of 5. This was despite excellent faculty, voluminous quality research output and a well-established doctoral programme. The divergence of opinion between the Committee established by the UGC and the Review Committee by the MHRD was disconcerting. The author informally spoke to one member of the Review Committee with the objective of knowing the philosophic basis of evaluation. This talk was rewarding as it helped to understand the concerns of the Review Committee. Our response was to explain our philosophy and wherever needed, make improvements. This was in contrast to the approach followed by some others who legally challenged the finding of the Review Committee.

In February 2011, the MHRD constituted a Task Force to reexamine deemed to be universities which were placed in category ‘B’. The members of the Task Force were the same as of the Review Committee. We submitted a report to the Task Force in March 2012 and a revised report incorporating suggested revisions in August 2012. We had a personal interaction with the Task Force on August 21, 2012 and finally in October 2012, HBNI was placed in category ‘A’. This meant that HBNI satisfies ‘most of the criteria for the deemed university status’.

### **Review by the National Assessment and Accreditation Council (NAAC)**

The process of accreditation by NAAC involves submitting a letter of intent, preparing a self-study report in a prescribed format, visit by a peer team for personal interaction and accreditation by the NAAC after the report of the peer team is accepted by the NAAC Council. The preparation of the self-study report for HBNI was an enriching experience and helped our understanding of running a university. While compiling details of faculty, we were happy to note that about one hundred members of faculty are fellows of various prestigious academies.

NAAC accredited HBNI with a CGPA of 3.53 on a four-point scale valid until 10 May 2020.

### **Ranking under National Institutional Ranking Framework**

The National Institutional Ranking Framework (NIRF) was approved by the MHRD and launched on September 29, 2015. This framework outlines a methodology, based on a set of parameters, to

rank institutions across the country. The parameters cover “Teaching, Learning and Resources,” “Research and Professional Practices,” “Graduation Outcomes,” “Outreach and Inclusivity,” and “Perception”. HBNI was ranked 17 in the India Rankings – 2016 released on April 4, 2016. Ranking could have been better, but for the fact that only those publications were considered as that of HBNI, where authors explicitly indicated their affiliation to HBNI. Many students and members of faculty, mention only the name of the Constituent Institution and such publications were not considered as that of HBNI.

### **Setting up National Institute of Science Education and Research and its Integration with HBNI**

Based on the recommendations of the Scientific Advisory Council to the Prime Minister, in 2006 the MHRD established two institutes, both named Indian Institute of Science Education and Research (IISER), at Pune and Mohali. To add to the efforts of MHRD, the DAE set up a similar institute at Bhubaneswar and this institute was named National Institute for Science Education and Research (NISER). While announcing the setting up of NISER on August 25, 2006, the then Prime Minister announced that it should be a part of HBNI.

IoP was tasked by the DAE to execute the project of setting up NISER. All students admitted to NISER became students of IoP and hence HBNI. Eventually NISER became independent of IoP and therefore, HBNI applied to UGC in 2009 to declare NISER as a constituent of HBNI. Almost in parallel, MHRD constituted the Review Committee referred to earlier to review all deemed to be universities. The UGC could not take up our request as HBNI was placed in category ‘B’ by the Review Committee. We again approached the UGC after HBNI was categorized as ‘A’ by MHRD. The response from the UGC came in the form of several queries and stipulations. The main point was to get accreditation from NAAC prior to integration of NISER into HBNI as an independent unit.

In the meanwhile, the UGC issued regulations for deemed to be universities and HBNI had to move on two fronts: one was to amend Memorandum of Association (MOA) and Rules to comply with the UGC (Institutions deemed to be universities) Regulations, 2010 and the second was to approach NAAC. We amended the MOA and Rules, which was a laborious process as one had to negotiate bureaucratic labyrinthine. The amendments involved re-designating Director as Vice-Chancellor and designating a Chancellor. Dr. S. Banerjee, former Director, BARC and former Secretary, DAE was designated as Chancellor.

After amendments and NAAC accreditation, all documents were submitted to the UGC in July 2015 and after more hiccups, the UGC notified NISER as an off-campus centre of HBNI in February 2016, seven years after the application. HBNI now has 11 Constituent Institutions (CIs): ten constituent units and one off-campus centre.

### **Idea of a university**

#### **Evolution of ideas**

Human civilization has come to the present stage of sophistication because of wisdom that has accumulated over centuries and has been transferred to us through successive generations. The mechanisms of intergenerational knowledge transfer include transfer within a family unit, a community, a trade guild, internship in a workplace, and institutes of education. Universities and

other institutions of higher education have been the centres for intergenerational knowledge transfer for the past several centuries and have been accomplishing their task efficiently. The idea of a university has, however, been continuously evolving. Review Team appointed by the MHRD used “Considerations of the idea of a University” as one parameter for evaluation, but presented only one viewpoint on the subject, which can be seen from the following paragraph from the report.

*“Universities are meant to be places – which facilitate and promote critical intellectual engagement with (a) different traditions of thought and its great variety of expression, (b) modes of understanding the human condition and predicament, (c) the incredibly diverse inanimate and non-human living world. **Such engagement has many utilitarian and extrinsic values; but it is its intrinsic value that marks it off as a very special sort of human practice**”<sup>7</sup>.*

John Henry Newman<sup>8</sup> had a similar viewpoint and opined that an ideal university is a community of thinkers, engaging in intellectual pursuits not for any external purpose, but as an end in itself. He envisaged an ideal university to be a place which imparts a broad, liberal education and teaches students "to think and to reason and to compare and to discriminate and to analyse" [4]. **Problem with ideas that stress only on intrinsic value is their sheer anti-utilitarianism.** These ideas are now going through evolution as can be seen by the Bologna Process<sup>9</sup>, which as part of the European Qualification Framework has resulted in a set of three descriptors: knowledge; skills both cognitive and practical; and competence in terms of responsibility and autonomy [5]. Gazette notification on National Skill Qualification Framework issued on December 19, 2013 by the Government of India and publication of ‘Skill Assessment Matrix for Vocational Advancement for Youth by MHRD are steps taken in India which recognize importance of skill development as a part of education of youth.

Tension between intrinsic value, and utilitarian and extrinsic values of intellectual engagement is central to the debate on the idea of a university. One can consider a university as **a guarantor of creative tension in which knowledge, competence and skills are held in balance**<sup>10</sup>. The distinctive function of the university is to keep that tension: between scholarship and engagement, abstraction and application, teaching and research [6]. This tension can be seen in the contrasting viewpoints of various expert committees about HBNI.

Japanese Society for Historical Studies on Higher Education held a conference in 2005 and the main theme of the conference was “The Idea of a University in Historical Perspective.” Educationists from Germany, Britain, USA and Japan participated in the conference. In the concluding remarks [7], Karoru Narisada writes that throughout the long history of the university, the process of adopting to the circumstances of each country, and fulfilling various functions has led to the co-existence of several “ideas of a university.” In the same conference, Goldman argues

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<sup>7</sup>Emphasis by the author.

<sup>8</sup> John Henry Newman gave a series of lectures in 1852 in Dublin reflecting on the university's purpose that were published as a book titled ‘The Idea of a University’ in the same year.

<sup>9</sup> The Bologna Process is a series of ministerial meetings and agreements between European countries designed to ensure comparability in the standards and quality of higher education qualifications.

<sup>10</sup> Anne Corbett [6], has used knowledge, intellect and skills in place of knowledge, competence and skills.

that “(the Victorians) bequeathed several different ideas of a university in a single institution, and it is our task to ensure that the many are not reduced towards the one.”

Importance must be given to all three that is knowledge, skills and competence, and relative importance to the three components can vary from discipline to discipline and also from student to student. Concentration on intrinsic values to the exclusion of extrinsic values is not conducive to further development of the modern society, where technology rules every aspect of life. While majority of beneficiaries of higher education will contribute to society based on the skills and competence they acquire at the university, there will always be individuals, who will develop strong intrinsic insights into knowledge and will address higher needs of the modern society.

**In short, we must celebrate the co-existence of several ideas of a university.**

### **An examination of HBNI**

We may examine the concept behind HBNI in the light of several ideas of a university that have been in existence. Many workplaces including large corporations, research centres, other organizations, both national and international have come on the scene comparatively recently, and have emerged as users of knowledge and skills as well as contributors to knowledge generation and skill development. Workplaces are store-houses of knowledge that needs to be preserved and transferred. The classical approach separates workplaces, making use of knowledge and skills, from universities, which transfer knowledge and impart skills, to students. This separation is, however, not universal. In the field of medicine, schools and hospitals are integrated into a single institution or are co-located. Medical professionals teach students as well as practice their profession. The author has always wondered as to why this model has not been extended to other disciplines. Educationists always refer to unity of “education and research” and the author feels that this should be changed to **“unity of education, practice and research.”**

Nuclear science and engineering is a multi-disciplinary subject and requires a large faculty resource. Challenged by this requirement, programmes in nuclear science and engineering in institutions in India are at sub-critical level. This situation has persisted for a long time. Squeeze in public funding for higher education has led to concepts like cooperation and partnership between universities and workplaces. The model of HBNI takes this forward by integrating a ‘workplace’ and a ‘university’ in a single entity. It is a step in the process of further evolution of the ‘idea of a university’. It is a very low-cost solution for providing manpower in an area crucial for national development.

Research centres of the DAE are organized in divisions to accomplish assigned tasks and a division has individuals specializing in different disciplines to work towards a mission. A university in India invariably has discipline-specific Boards of Studies. Discipline-specific boards are perhaps desirable for under-graduate studies, but their usefulness for doctoral research is questionable particularly for a multi-disciplinary field like nuclear science and engineering. To meet the requirements of regulations, discipline-specific Boards of Studies were constituted, but the existing concept of divisions at the R&D centres was not disturbed. This ensures continuation of the DAE culture of working in inter-disciplinary teams. It also fits with the viewpoint that “we should have deep and sustained communication between scientists and engineers, between theorists and practitioners” [8]. Structure of HBNI provides for such communication.



## **Consolidation**

### **Integration of constituent institutions**

Bringing synergy between various DAE institutions was one of the goals of setting up of HBNI. After due reflection, we came up with the idea of having one or more deans in a CI to manage academic affairs of the CI. This helped in distributing responsibility of running academic programmes and involved CIs in decision making. A Standing Committee of Deans has been constituted which meets about four times in a year. Several responsibilities are delegated to Deans and this has given them a say in governance and resulted in a feeling of ownership of the university. To manage affairs at the level of the CI, each CI has set up a university cell and one or more Standing Academic Committee(s).

The total number of doctoral students who have completed their programme will soon reach one thousand, while the annual output has already reached 200 and is set to exceed 300 by mid-2018. Number of students, who have completed an M.Tech. will also soon reach one thousand. Number of students admitted to post-graduate and super-specialty programmes in Tata Memorial Centre has increased from about ten per year prior to setting up of HBNI to 112 now. Many new academic programmes have been started. When we started, people did not know each other, but now they are working together as a team based on guidelines which have been developed collectively.

### **Establishing a university culture**

During about eleven years of its existence, following an approach based on prudent gradualism, the HBNI has established itself as a leading research university. Prudent gradualism had to be followed on two fronts. In interaction with outside academics and officials from accrediting agencies, one had to explain the unique architecture of HBNI as a further evolution of the idea of a university. In dealing with stakeholders inside the HBNI, one had to work to superimpose a 'university culture' over the existing culture and this involved several facets: one was to explain to practicing professionals their role and responsibilities as faculty towards students; the other was to explain the difference between doctoral research that has to be completed by a student in a certain time frame versus working on large research problems which may be done by individuals or team of researchers over a longer time period. Now we have reached a situation where the university culture is understood and integrated with the existing culture.

### **Defining status of HBNI within DAE**

While HBNI is registered as a Society as well a Trust, its status within the DAE remained undefined until 2014. This raised certain operational issues. Therefore, the matter was pursued and HBNI became a “Grant-in-Aid” institution of the DAE on February 19, 2014. The change in status was followed by steps related to manpower deployment, framing recruitment rules, financial rules etc. After accomplishing all this, tenure of the author as head of the Institute was over and Prof. P.D. Gupta, formerly Director RRCAT, took over as the Vice Chancellor with effect from September 14, 2016 after a short stint by Prof B.K. Dutta as officiating Vice Chancellor.

### **Epilogue**

In the beginning, running of HBNI was like conducting an ‘orchestra of soloists’. Normally in an orchestra, all musicians practice together and are well integrated in every way. Once in a while, a conductor is called upon to conduct an orchestra of soloists, who are accomplished musicians in their own right. This becomes very challenging for the conductor. The Standing Committee of

Deans moderated the challenge as it provided a forum to all to express their views and helped in building synergy. I thank all the Deans at CIs for excellent teamwork.

Thanks to all members of the team in the Central Office particularly the former and the present Deans Prof R.R. Puri and Prof B.K. Dutta. Thanks also to Associate Deans Prof Dilip Maity and Prof Adarsh Dureja, who have been efficiently running the academic unit. For evolving office procedures, Dr. Avichal Kapur and Dr. Rajan Patel made valuable contributions. Dr. Kapur, who later joined HBNI as a Registrar, was helpful in dealing with statutory agencies. Prof KS Sharma, TMC dealt with all issues related to the Medical Council of India.

Establishing HBNI was full of challenges in view of over-regulation of higher education in India. Bureaucracy, in view of regulations, is constrained to follow a compliance-driven approach rather than an intent-driven approach resulting in challenges whenever a unique situation arises. Having overcome challenges, I wish that innovation in the governance of institutes of higher education should be a continuous affair to make India a knowledge society.

In April 2003, during a dialogue related to constituting a steering committee for setting up HBNI, the then Secretary DAE advised the author to spend most of his time on human resource development. Events after this dialogue were very interesting and challenging.

DAE nominated me to be a member of a delegation leaving for Washington DC on December 17, 2003 to discuss Next Steps in Strategic Partnership (NSSP). That began my involvement with the initiative of the Government of India to open International Civil Nuclear Cooperation [1, 2]. This led to frequent travel to interact with policy wonks in several countries, and the soubriquet ‘nuclear diplomat’ by my friends. To work as a nuclear diplomat, it is necessary to know nuclear law. In June 2004, I received an invitation from the Director General, International Atomic Energy Agency to serve on an international expert group to examine multilateral approaches to nuclear fuel cycle. This gave me an opportunity to interact with experts in nuclear law and diplomats handling nuclear issues. The resulting exposure to nuclear law gave me the confidence to work as a nuclear diplomat.

I was heading HBNI concurrently with being the head of strategic planning in the DAE. Immediately after superannuation from the DAE in February 2013, I was appointed DAE Homi Bhabha Chair and this enabled continuation of my involvement with issues related to nuclear diplomacy including being sous-Sherpa for the Government of India for the nuclear security summit process, and representative of India in the ITER<sup>11</sup> Council as the Head of the Indian delegation.

Both jobs, setting up of HBNI and participation in various negotiating and outreach teams (for drafting nuclear cooperation agreement with various countries, for drafting India-Specific Safeguards Agreement and Additional Protocol thereto with the Secretariat of the International Atomic Energy Agency, outreach with countries participating in the Nuclear Suppliers Group) for opening civil nuclear cooperation were extremely demanding. Both jobs involved a giant leap of faith, both demanded quick learning, both were groundbreaking and demanded skillful negotiations. However, a “can do” outlook, and full support by the establishment and colleagues

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<sup>11</sup> The project ITER is being built in France jointly by China, EU, India, Japan, Russia, South Korea and the USA

helped and now after having successfully accomplished my role in both, I can look back with satisfaction. Support from colleagues and establishment reminds me of a couplet by Majhrooh Sultanpuri:

“मैं अकेला ही चला था जानिब-ए-मंज़िल मगर लोग साथ आते गये और कारवां बनता गया”

“I started alone towards my destination, but colleagues kept joining and a caravan was made up.”

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