

DAE Annual Report (January 2020 to December 2020)

Human Resource Development Division

MP-6 Research Education Linkages

Summary

Human Resource Development Division (HRDD) of BARC mainly fulfills its mandate through BARC Training School (BARCTS), established in 1956 at Mumbai. It has 4 more Training Schools at - RRCAT, Indore (since 2000); IGCAR, Kalpakkam (since 2006); NFC, Hyderabad (since 2001); and AMD, Hyderabad (since 2010). They provide highly skilled human resources to DAE through two flagship programmes—OCES (Orientation Course for Engineering graduates and Science Postgraduates) and DGFS (DAE Graduate Fellowship Scheme). Under OCES, the 1-year academic programme at each BARC TS is designed to fulfill course requirements for an MTech, MPhil or PhD degree of HBNI (Homi Bhabha National Institute). This linkage of BARCTS programmes with HBNI ensures continuous availability of professionally qualified, well trained and motivated scientific and technical manpower for induction into various units of DAE, and thus helping it to fulfill its main mandate to enhance share of nuclear power in the country and to contribute to national security.

A total of 74 graduating TSOs (53 engineering+ 3 physics + 4 chemistry + 5 biosciences + 9 RSE), after successful completion of the training, were placed in various units of DAE. There were 9 Trainee Defence Officers (TDO) who passed out with this batch and assigned to different Divisions/Units for undertaking project for pursuing MTech. Also, 4 fellows of OCDF 2018 (DGFS-2016-18) scheme, after successful completion of the training, went back to their respective Divisions in BARC.

The number of applicants was 121332 as compared to 1,40,622 last year. Of them 71341 candidates appeared in the online examination as compared to 83,003 in the previous year. In order to enhance the reach, HRDD pursued its outreach programme quite vigorously.

HRDD coordinates practical training (1 to 2 months) and academic projects (3 to 12 months) in BARC for students of BE/B.Tech/M.Tech/ME/MSc/MCA/JRF/SRF from all over the country. During January –December, 2019, 1387 students from different institutes visited BARC for training/project work.

During the year, HRDD celebrated Graduation Function of the outgoing batch viz 62nd and the inaugural Function of the incoming 63rd batch of Training School in befitting manner.

RTI applications received by HRDD generally pertain to the Selection Process for the OCES/DGFS programmes of the BARC Training Schools. Information provided by HRDD include: (i) GATE cut-off scores in the previous recruitment cycle (ii) Online cut-off marks in the previous recruitment cycle (iii) Question Papers for the previous year's Online Exam etc. The other set of queries come from applicants who appeared for Selection Interview but were not finally selected. In this case, the applicants seek to know (i) Marks awarded to them in Selection Interview, and (ii) Cut-off Interview Marks for final Selection to OCES/DGFS. During the year 2020, 22 RTI applications were received and replied to.

Detailed Report

6.01 Human Resource Development: Human Resource Development Division (HRDD) of BARC mainly fulfills its mandate through BARC Training School (BARCTS), established in 1957 at Mumbai. It has 4 more Training Schools at - RRCAT, Indore (since 2000); IGCAR, Kalpakkam (since 2006); NFC, Hyderabad (since 2001); and AMD, Hyderabad (since 2010). They provide highly skilled human resources to DAE through two flagship programmes—OCES (Orientation Course for Engineering graduates and Science Postgraduates) and DGFS (DAE Graduate Fellowship Scheme). Under OCES, the 1-year academic programme at each BARC TS is designed to fulfill course requirements for an MTech, MPhil or PhD degree of HBNI (Homi Bhabha National Institute). This linkage of BARCTS programmes with HBNI ensures continuous availability of professionally qualified, well trained and motivated scientific and technical manpower for induction into various units of DAE, and thus helping it to fulfill its main mandate to enhance share of nuclear power in the country and to contribute to national security.

Induction of 64th Batch: While the academic programme of the 63rd batch was continuing, screening examination for 9 engineering and 4 science disciplines for the 64th batch was organized successfully at 76 venues in 43 cities.

HRDD's outreach programme, like last year, was supported by the participation of officers from RRCAT, IGCAR, NFC and VECC in addition to those from BARC. Institutional coverage by BARC officers was 21, while the number stood at 62 by officers from other Units of DAE. It was a comprehensive national level coverage.

The number of online applicants for OCES/DGFS was 1,21,332 as compared to 1,40,622 last year. Of them 71341 candidates appeared in the online examination as compared to 83003 in the previous year. The number of applicants in the science disciplines was 21834 as compared to 22,755 in the previous year and the number appeared for the examination was 14180 as compared to 15,361 in the previous year. A total of 2,449 candidates (1573 via online examination+ 837 via GATE + 39 CBS-NISER candidates via Direct Entry) were shortlisted for the selection interview. Recruitment data are given in Table 1 and also displayed in the form of PIE diagrams and bar charts in Figures 1, 2, 3 and 4. A total of 199 candidates were selected for OCES/DGFS-2020 as compared to 248 last year.

The 63rdOCES Batch of BARC TS was inaugurated by Dr. Ajit Kumar Mohanty, Director BARC as Chief Guest on August 1, 2019. Discipline wise distribution of all TSOs, HBNI-PhDs, Defence, JRFs etc is summarised in Table 2.

Graduation of 62ndBatch:A total of 74 graduating TSOs (53 engineering+ 3 physics + 4 chemistry + 5 biosciences + 9 RSE), after successful completion of the training, were placed in various units of DAE. There were 9 Trainee Defence Officers (TDO) who passed out with this batch and assigned to different Divisions/Units for undertaking project for pursuing MTech. Also, 4 fellows of OCDF 2018(DGFS-2016-18) scheme, after successful completion of the training, went back to their respective Divisions in BARC.

Graduation Function of BARC Training School was held on July 26, 2019 with Prof. Ashutosh Sharma, Secretary, Department of Science and Technology as the Chief Guest and Shri K.N. Vyas, Chairman, AEC, and Secretary DAE as the Guest of Honour. Chief Guest gave away Homi Bhabha Prizes to the toppers of 11 OCES disciplines of 62ndbatch and the topper of the 15thbatch OCDF course. All the officers belonging to the 62nd OCES and 15th OCDF Batch, along

with their parents and spouses were invited for the Function. Hostel night was also celebrated. During the year, all TSOs and TDOs were taken on a guided tour of DAE facilities at Tarapur. HRDD hosted TSOs from other BARC Training Schools and facilitated their visit to BARC Mumbai.

Ground Work for Recruitment for OCES/DGFS-2020: Work for OCES/DGFS-2020 programmes began in November-December, 2019 with the preparation of advertisement to be published in the first week of January 2020. A short advertisement in the Official Language in Hindi language daily newspapers in the Northern Hindi-speaking belt was also released besides a long advertisement in leading national and regional dailies. A full-page advertisement was also released for publication in 'Employment News'.

In order to promote DAE activities and thereby attract best talent to our fold, visits to many colleges and universities as possible have been conducted during October 2019 to December, 2019 under the outreach programme. The Online examination is planned during March 13 - 19, 2020 in about 20 cities/towns with multiple venues in cosmopolitan cities.

Fast Reactor Technology was launched as an additional Training Scheme for Trainee Scientific Officers belonging to Electrical & Electronics Engineering at the BARC TS at IGCAR, Kalpakkam.

OCES & DGFS Course work: By the end of March 2019, foundation and core course work along with examinations for OCES 2018 had been completed. It was followed up with technical visits to DAE facilities at Tarapur, placement viva, elective courses, mini-projects, administrative workshop etc. The soft skills workshop for all the TSOs, introduced during OCES 2012, continued for OCES 2018 as well. At present, the academic course work of 2nd semester of 63rd Batch is in progress, and by end of March, 2020, the semester examinations would be completed. During the present year, a total of about 150 of over 170 courses consisting of foundation, core and elective courses were taken by TSOs. To conduct such a wide variety of courses, HRDD depends on other Divisions/Units of DAE. A faculty of about 520 practicing scientists and engineers were invited from various Divisions/Units of DAE. Mini-projects this year were allotted to TSOs in consultation with their prospective Divisions/Units. About 90 Scientists and Engineers supervised the project work of the TSOs.

Training for ETs of NPCIL: At the request of NPCIL, HRDD agreed to continue, for 2nd year, to impart training to a batch of civil engineering candidates selected by NPCIL. These candidates called 'Executive Trainees' (ET-NPCIL) were accommodated in TSH. However, they were not being trained under OCES programme of BARC Training School. Their entire course work, mini projects, technical tours, welfare etc. are being looked after by a special committee constituted by Head, HRDD. The committee has coordinators from HRDD, NPCIL and AERB. They appeared in exams. They were not entitled for PG Diploma certificate from BARCTS. On completion of training, all of them were absorbed by NPCIL.

Training for Trainees of ECIL: Additionally, this year, 4 trainees, who passed through OCES selection process and recruited by ECIL are being given training at HRDD. As in the previous years, there are 6 others undergoing the OCES training course.

Also, there are 8 DAE PhD students in Science Disciplines and 10 DGFS PhD in Engg disciplines undergoing coursework in BARC TS.

Evening Lecture: Dr. Anil Kakodkar delivered an evening lecture to TSOs on the topic of '**Atomic Energy and Sustainable Development**'. It was the most appropriate topic for the target audience of budding scientists and engineers, who had taken a call to join the Department of Atomic Energy (DAE) in order to serve the country. Dr. A.P. Tiwari, Head, HRDD made the formal 'Introductory Remarks', while the 'Welcome Address' was delivered by Dr. D. Das, Co-chairman, BARC TS Apex Committee.

Dr. Kakodkar, the doyen of nuclear world, introduced his subject to the audience in the simplest form. He went on to build the subject and take the audience on a spell-winding journey on atomic energy covering many of its aspects including how atomic energy was going to play an increasingly bigger role in the mix-energy basket of a country like ours, given its geography, topography and present-day energy deficiency status.

International Yoga Day Celebration 2019: HRDD, under the guidance and direct supervision of qualified Yoga experts, celebrated 5th International Yoga Day. The target participants were all the TSOs of 62nd batch of BARC Training School and HBNI PhD students. Some of the HRDD personnel voluntarily participated in the event.

In order to maximize the benefit of Yoga, HRDD in collaboration with HBNI chose early hours of the Saturday (22nd June) instead of the actual date of 21st June for celebrating the International Yoga Day. The programme was done in 3 parts.

The 1st part was a kind of inauguration of the International Yoga day celebration, wherein an ensemble rendered out very motivational and inspirational songs to the wonderfully composed music. Dr. A.P. Tiwari, Head, HRDD welcomed all the participants along with the professional Yoga guests present on the occasion. Then Prof. P.D. Naik, Dean, HBNI addressed the participants.

Thereafter began the 2nd part, when professional Yoga experts from DAE Yoga circle who had been invited to help and guide the trainees and PhD students took over the reins to conduct the practical session of Yoga. During the session, there were 2 lead demonstrators who performed different Asanas (exercises/postures) of Yoga as per the instructions/announcements from the Yoga Guru. This part was done under direct supervision of Dr. P.B. Rishikeshan, an expert Yoga Instructor.

Programme's 3rd part had a Yoga-themed lecture titled "Yoga for Youth for Holistic Health" marvelously delivered by Dr. (Smt.) Anuradha Chakrabarty, Doctor in-charge of Anushaktinagar dispensary, Medical Division, BARC. Through her simple talk she tried to address many issues which the young generation is grappling with. In the friendliest manner, she tried to impress upon the young audience how they can lead a tension-free happy life.

The programme concluded with a vote of thanks delivered by Prof. B. Chandrasekar, Registrar, HBNI. The entire programme was well compered by Kum. Yogita, a TSO.

Trainees Visits to 'Vigyan Samagam' at Nehru Science Centre: HRDD, in order to provide valuable exposure, took its TSOs and PhD students to 'Vigyan Samagam' which was being held at Nehru Science Centre, Worli.

The programme had a mix of activities consisting of popular talks, science demonstrations, interactive quiz programmes, etc.

HRDD's QUEST Programme Under CEP: HRDD is responsible for organizing QUEST under Continuing Education Programme of the Department. QUEST is a novel programme, approved by TC, which offers an opportunity for HBNI PhD students and for employees of DAE units located in Mumbai and Navi Mumbai to upgrade their knowledge on advanced level courses approved by BOS (Board of Studies) of HBNI. For past several years now, HRDD has been successfully running the QUEST by proposing, executing and completing many advanced courses.

The QUEST courses are offered either in the morning or in the evenings beyond the normal office hours. They are 30-session courses, and each session is of one-and-a-half-hour duration. All the sessions are held at HRDD, Anushaktinagar with a normal frequency of two sessions per week.

Details of the courses offered during the year and status thereof are summarized below:

S.No.	Course Title	Coordinator/Faculty	No. of Students Registered	No. of Candidates Appeared in exam
1	State-space approach to Reactor Control	Dr. A.P. Tiwari OS & Head, HRDD and RCSDS	13	Course in progress
2	Natural Circulation Based Passive Safety System for Advanced Reactor	Dr. P.K. Vijyan RRF, formerly Director, RD&DG, BARC	9	Course concluded
3	Signal Conditioning & Recovery	Dr. S. Mukhopadhyay OS/ Head, Seismology Division	12	Course in progress
4	Advanced Computational Physics	Dr. Kondayya Gundra, SO(G), ThPS	20	Course concluded

HRDD issues certificates to all those candidates who score an aggregate of 50% or more marks. As per the guidelines, aggregate score is arrived at by awarding a minimum of 60% weightage to written examination(s) while limiting the home assignments (Continuous evaluation) weightage to 40%.

Practical Training and Academic Projects for Students: HRDD coordinates practical training (1 to 2 months) and academic projects (3 to 12 months) in BARC for students of BE/B.Tech/M.Tech/ME/MSc/MCA/JRF/SRF from all over the country. During January – December, 2019, 1387 students from different institutes visited BARC for training/project work. Details of month wise acceptance and reporting of such students for the year 2019 is summarised in Table 3 and is also displayed in the form of a bar chart in Fig 5.

Allotment of M.Tech Project Work: Soon after formal joining (on August 1, 2019) of different Divisions/Units of DAE by the graduate TSOs, the process of undergoing of M.Tech project work got underway in consultation with the respective Head of Division/Unit. The allotment of M.Tech Projects to all the eligible fresh officers from OCES 2018 has been completed. M.Tech (new) enrollments during the period were 76. A total of 36 candidates completed M.Tech during the period.

Recruitment of PhD students under HBNI: HRDD recruits students having M.Sc Degree in Physics, Chemistry and Bio Science for DAE PhD Scheme in BARC under HBNI. The recruitment process is through on-line Screening test carried out at a large number of centres throughout the country followed by the interview at BARC Training School.

Recruitment of Engineering students having M.Tech or equivalent Degree is carried by Off-line OMR based written exam in some major cities in the country and the students who qualify through the screening test are called for interview at BARC Training School. The selected students join research projects at four Constituent Institutes of HBNI namely BARC, IPR, IGCAR and VECC.

HRDD makes the necessary arrangements for medical test, issue of Identity Card and CHSS card for the students who join the research projects in BARC. HRDD Coordinates with BRNS, DAE and SPC for release and payment of stipend to the PhD students.

The students who join PhD after M.Tech get fellowship for a period of 4 years under DDFS PhD scheme while those students who join PhD after M.Sc. get fellowship under DAE-PhD scheme.

The DAE employees enroll for PhD under HBNI. As in the previous years, HRDD coordinated between the Dean-Academics and HBNI for all PhD related tasks.

Maintaining Infrastructural Facilities: HRDD maintains a well-stocked library consisting of 5255 textbooks, 2261 reference books, 98 NPCIL design manuals, 1708 BARC reports. There are 5 computers for accessing internet and OPAC. The library is now 100% automated with LMS (Library Management System). It is equipped with self-check-in/check-out facility through RFID kiosk. There are 2 computer labs with 20 computers, 2 network printer and 2 normal printers. HRDD also maintains a Nuclear Physics (for radiation detection and measurement experiments) and 2 Process Control Labs. A 540 MW PHWR (1:50) model kept near ground floor entrance helps in understanding the reactor layout. The display model is accessible to all including visitors. Access control system consisting of 4 sets of flap barriers and one turnstile at TS Complex in addition to CCTVs in TSH are functioning well. All the trainees staying in TSH are provided with internet connectivity in individual rooms.

Regarding RTI: RTI applications received by HRDD generally pertain to the Selection Process for the OCES/DGFS programmes of the BARC Training Schools. Information provided by HRDD include: (i) GATE cut-off scores in the previous recruitment cycle (ii) Online cut-off marks in the previous recruitment cycle (iii) Question Papers for the previous year's Online Exam etc. The other set of queries come from applicants who appeared for Selection Interview but were not finally selected. In this case, the applicants seek to know (i) Marks awarded to them in Selection Interview, and (ii) Cut-off Interview Marks for final Selection to OCES/DGFS. During the year 2020, 22 RTI applications were received and replied to.

Table 1: Recruitment Data – OCES/DGFS – 2020

	ME	CH	MT	EE	EC	CS	IN	CE	NE	Engg	PH	CY	BS	GE	Sc	Total
Numbers Applied	29002	5159	1337	17765	17783	11600	1887	14940	25	99498	8070	6383	5538	1843	21834	121332
Appeared BARC Test	17858	3393	933	10261	9426	6138	1169	7964	19	57161	5199	3967	3638	1376	14180	71341
Appeared Interview	478	206	51	75	154	43	32	45	2	1086	257	132	54	157	600	1686
Appeared Interview By GATE	129	60	19	9	41	11	8	5	0	282	51	31	8	39	129	411
Appeared InTerviewBy BARC Test	349	146	32	66	113	32	24	40	2	804	199	95	39	118	451	1255
Appeared Interview Through CBS/NISER											7	6	7		20	20
Selected by GATE	21	4	2	2	6	2		2		39	13	3	1	10	27	66
Selected by BARC Test	27	18	4	10	12	5	4	5		85	20	12	6	10	48	133
Selected through CBS/NISER											0	0	0		0	0
Total Selected	48	22	6	12	18	7	4	7		124	33	15	7	20	75	199
OCES-AMD														20	20	20
OCES-BARC	18	7	6	12	10	7	4	7		71	14	9	7		30	101
OCES-BARC-RSE										0					0	0
OCES-IGCAR	12	9								21	5	6			11	32
OCES-NFC/HWB	18	6								24					0	24
OCES-RRCAT					8					8	6				6	14