INTERNATIONAL CONFERENCE ON HUMAN RESOURCE DEVELOPMENT FOR NUCLEAR POWER PROGRAMMES: BUILDING AND SUSTAINING CAPACITY

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EDUCATION AND TRAINING OF NUCLEAR ENERGY PERSONNEL: THE NIGERIAN INITIATIVE

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Introduction

- The Nigerian Nuclear Energy Programme, like most newcomer countries, is characterized by lack of skilled workforce, lack of training infrastructure (human resource and facilities), an aging workforce and lack of interest in taking up career in the nuclear industry by the young generation.
- Nigeria has developed a creative mechanism to generate the critical workforce needed to implement the National Nuclear Energy Programme (NNEP).
- This mechanism involves partnership between Nigeria Atomic Energy Commission (NAEC) and national institutions to meet the challenging manpower training requirements for the implementation of the national nuclear power programme.

Processes Leading to the Development of Nuclear Education Programmes

All stakeholder institutions and representatives of the National Universities Commission (NUC) and Council for the Regulation of Engineering (COREN) met and initiated the following activities to commence the national nuclear education programme:

- Designing of curricula for educational professional programmes.
- Building of requisite training and research infrastructure in educational institutions.
- Expediting implementation of graduate degree programmes to grow the critical corps of academics who would serve as the core trainers in the implementation of the educational and professional programmes.
- Catalysing the creation and ownership of these programmes in nuclear engineering, nuclear science and nuclear security by universities and polytechnics.
- Creating appropriate linkages for offshore cooperation with local institutions for manpower training.
- Creating the requisite interface for formalizing the professional recognition and registration of products of the educational programmes by respective professional bodies (COREN, etc.)

Processes Leading to the Development of Nuclear Education Programmes Contd.

The outcome of these national efforts resulted in:

- Introduction of appropriate diploma, undergraduate and graduate degree programmes in nuclear science and engineering in the partnering institutions.

- Development of the curricula for an intensive 3-month bridging programme and for the Master's degree programmes in nuclear science and engineering. The intensive 3-month bridging programme serves as the precursor to the Master's degree programme.

- Appropriate Memorandum of Understanding (MOU) being entered into by NAEC and local institutions for partnerships in developing programmes at the graduate level for the training of academics and researchers.

Strategy for the Development of Masters Programmes in Nuclear Science and Nuclear Engineering

To ensure continuous availability of the faculty personnel to teach the new courses in nuclear science and engineering, the first step taken was the development of a conversion programme for top-flight fresh graduates in the physical sciences and engineering, through an intensive 3-month bridging programme which exposed them to the fundamental core courses in nuclear science and engineering.

- The 3-month intensive bridging programme prepared the graduands to be trained in more specialized areas of nuclear technology, and also to be admitted into the Master's degree programmes.
- The graduands of the 3-month intensive bridging programme serve as an available pool of qualified candidates for the quick and efficient implementation of the Masters programmes in a centralized fashion to produce young academics who can then participate as lecturers in the undergraduate programmes.
- NAEC, as a facilitator worked in partnership with the partnering universities and developed curricula for Masters' degree programmes in Nuclear Science and Engineering.

Key Decisions for the Implementation of Masters Programmes in Nuclear Science and Nuclear Engineering

The key decisions are:

- Development of a common platform for the implementation of the Masters' Degree programmes across the partnering institutions in a standardized and harmonized fashion.
- Pooling the national resources and available facilities at all the nuclear energy research centres in a centralized manner, under the financial sponsorship and guidance of the Nigeria Atomic Energy Commission.
- Working out technical details of the programme with a view to facilitating its expeditious approval by both the participating institutions and the National Universities Commission (NUC).
- Modular approach in teaching the students. The lecturers are drawn from within and outside Nigeria as well as from the industry.
- Each partnering university admits its students (preferably graduates of the 3-month bridging programme) and awards the degree in accordance with its statutes and regulations.

Key Decisions for the Implementation of Masters Programmes in Nuclear Science and Nuclear Engineering Contd.

- The students are to register in their individual universities, spend the first month for the general module, proceed to the Nuclear Technology Centre (NTC) for six months and then return to the university for seminars, electives and other courses as well as for their research project and thesis.
- The programme is for 15 months.
- A Joint Academic Board chaired by NAEC-CEO, oversees the programme implementation to ensure maintenance of standards. Other members are the Course Coordinator, the Deans of Science, Engineering, Postgraduate School, Directors of Academic Planning and respective Centre Directors from each university, as well as a representative each of the NUC, COREN and the Nuclear Society of Nigeria.
- NAEC to pay tuition fee per student admitted to each university and to be committed to the development of the physical and educational infrastructural facilities in the universities.
- Also payment of honorarium to lecturers involved in the teaching will be made.

Mode of Instruction and Management

- 70% of the core courses are taught at the centralized facility in NTC-Sheda.
- Each course is offered as a module.
- Each lecturer teach the assigned module within the specified time, administered the examination and graded the students before departing.
- Some modules are run concurrently to minimise monotony.
- Students are moved to appropriate centres, when the use of a particular major facilities (such as a research reactor) is required in the teaching of a specified course.
- 60% of the courses were taught by indigenous lecturers while 40% by offshore visiting lecturers through direct institutional contacts or through the coordination of the IAEA.
- At the central facility the programme was managed by a Course Coordinator who is appointed by NAEC.
- Students, on completion of the core courses at the centralized location in Sheda, proceeded to their respective universities for the university content of the programme.
- At the University of Port Harcourt, 13 students have graduated in M. Eng. Nuclear Engineering while another set of 11 students for MSc Nuclear Science at the University of Maiduguri are about to graduate.

Benefits

- The process of generating the critical human resources has commenced.
- The number of graduates is expected to increase yearly as the teething challenges are being overcome.
- It serves as a bridge in addressing the current manpower limitations across all institutions and would position NAEC to effectively build the needed capacity at the respective Centres while also meeting its manpower training obligations.
- The partnership would contribute to the building of the critical educational infrastructure and capacity in the individual universities so as to enable the partnering universities to independently mount a quality programme of this genre.

Challenges

- Class size may be larger than optimal and may negatively impact on effective teacher-student interaction.
- Inadequate complement of faculty staff in any single institution.
- Problems associated with release of offshore lecturers by their organizations or countries.
- *Internship and industrial attachment opportunities at experienced training facilities and utilities for hands-on trainings are also constraints.*

Conclusion

- The partnership between NAEC and the participating national institutions is yielding the desired result.
- The faculty staff for the implementation of the educational programmes is being generated as well as the teaching infrastructure.
- The continuous implementation of the educational programmes will surely generate the workforce imbued with the fundamental knowledge in nuclear science and engineering for specialist training programmes.

THANK YOU FOR YOUR ATTENTION