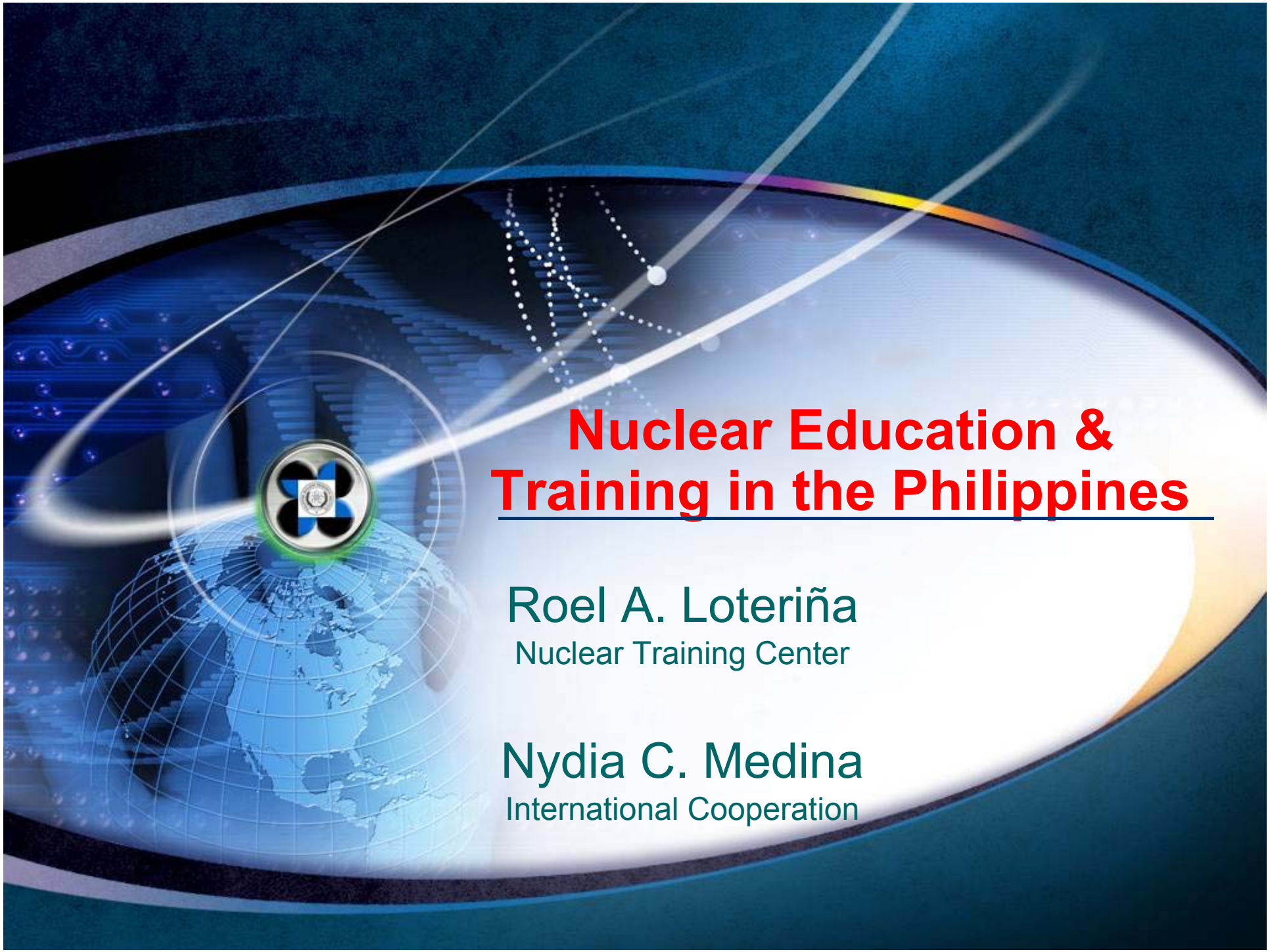

Nuclear Education & Training in the Philippines

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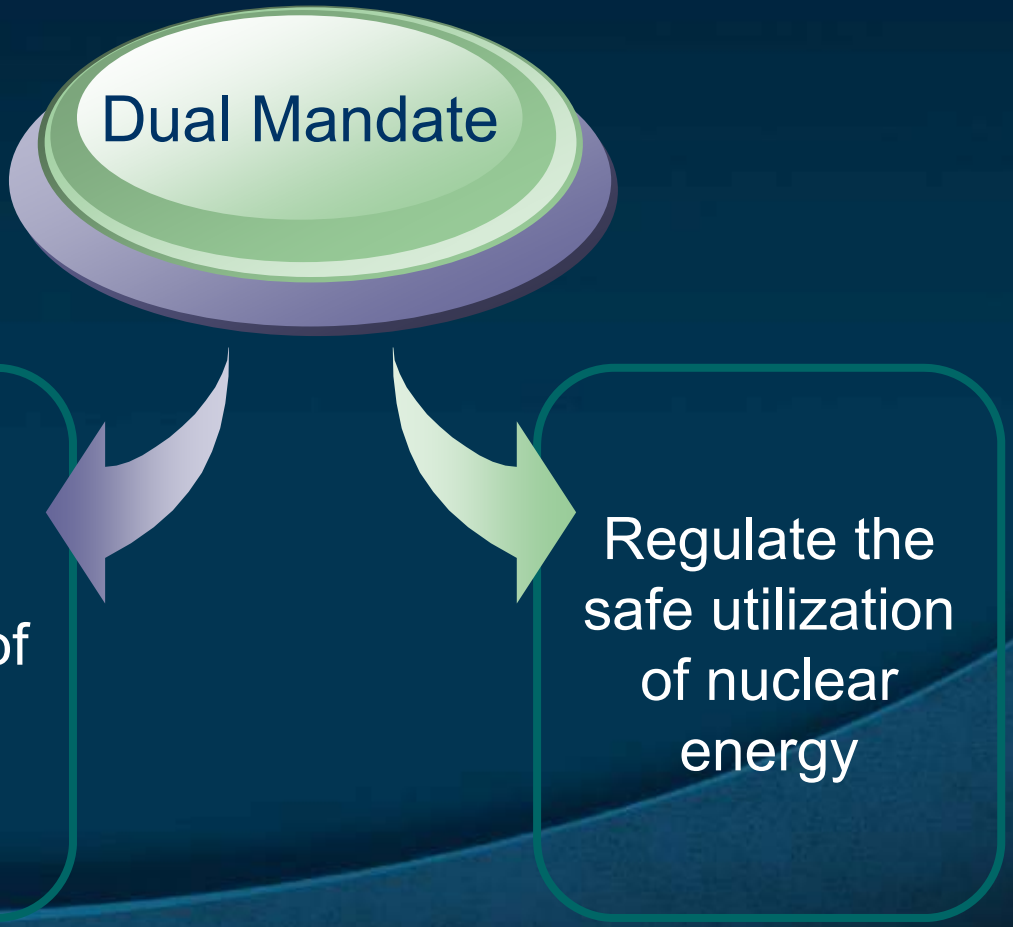
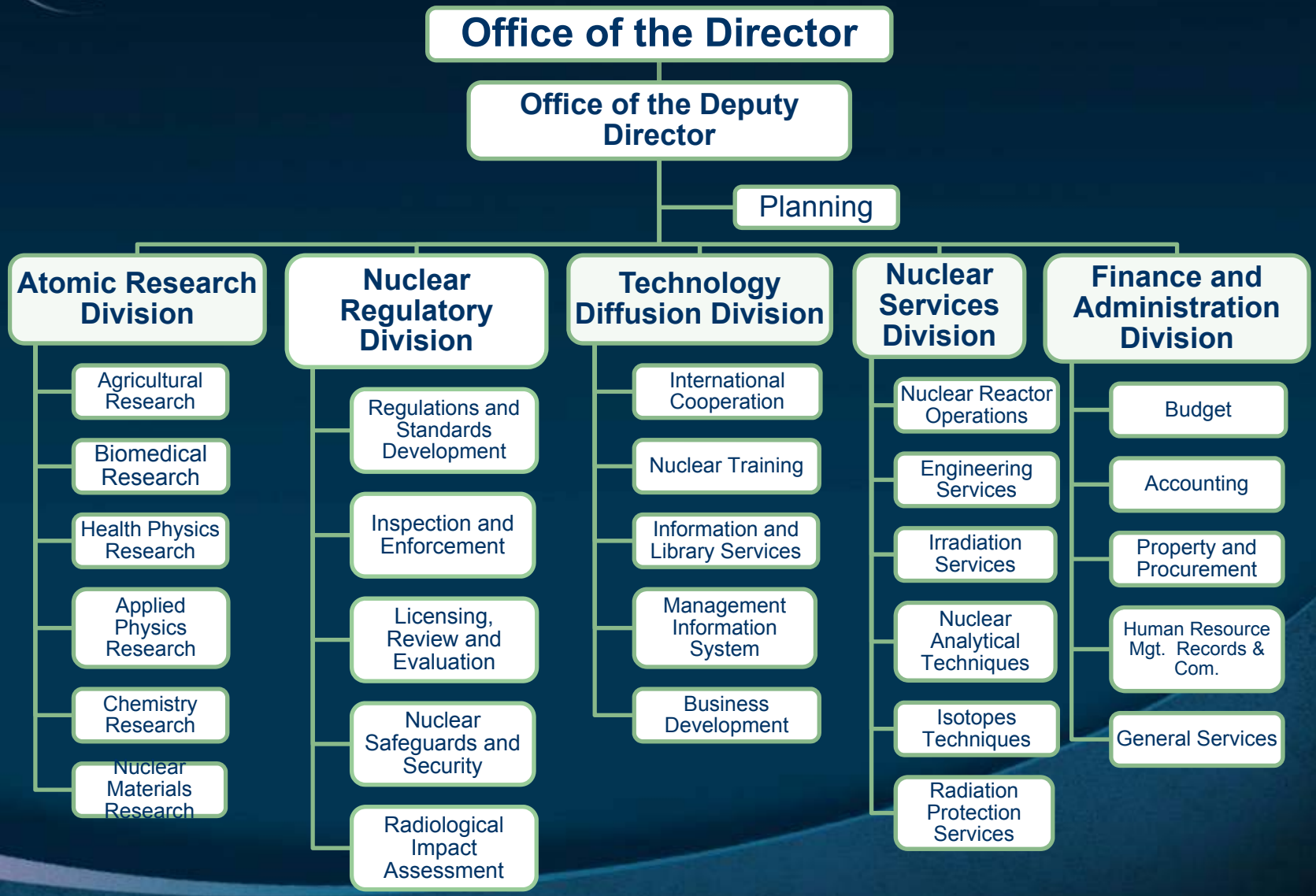


PNRI Organizational Structure



Core Competencies

- Nuclear research and development
- Nuclear services
- Nuclear regulation
- Technology transfer and diffusion

Strategy of HRD in Nuclear

- Strengthen local training conducted by the Nuclear Training Center of the PNRI
- Enhance nuclear S & T education in schools and universities, initially, send students abroad
- HRD through international cooperation
  - new techniques for education and training such as distance learning

HRD in the Nuclear Field

- Linkage with universities, specifically University of the Philippines to offer the one-semester Introduction to Nuclear Engineering in engineering curricula

- Nuclear Training Center of PNRI offers the 4-week course on Nuclear Science & Technology for University & College Faculty

HRD in the Nuclear Field

- Linkage with professional societies:
  - Philippine Society for Nondestructive Testing, Inc. (PSNT) cooperates with PNRI in offering NDT courses in Levels 1,2,3
  - PNRI supports the Philippine Society of Nuclear Medicine (PSNM) in the Distance Assisted Training for Nuclear Medicine Technologists
  - PNRI supports the Philippine Association for Radiation Protection (PARP) in the training courses in radiation protection

Training Conducted by PNRI

- The Nuclear Training Center of PNRI conducts nuclear training courses and seminars for non-power and power applications, as well as NDT.

- More courses on nuclear safety have to be introduced

Nuclear Training Courses

- Special Educational Course on Nuclear Engineering for Installation, Operation and Regulation of Nuclear Power Plant
- JAEA Follow-up Training Course on Nuclear and Radiological Emergency Preparedness and Response
- JAEA Follow-up Training Course on Environmental Radioactivity Monitoring

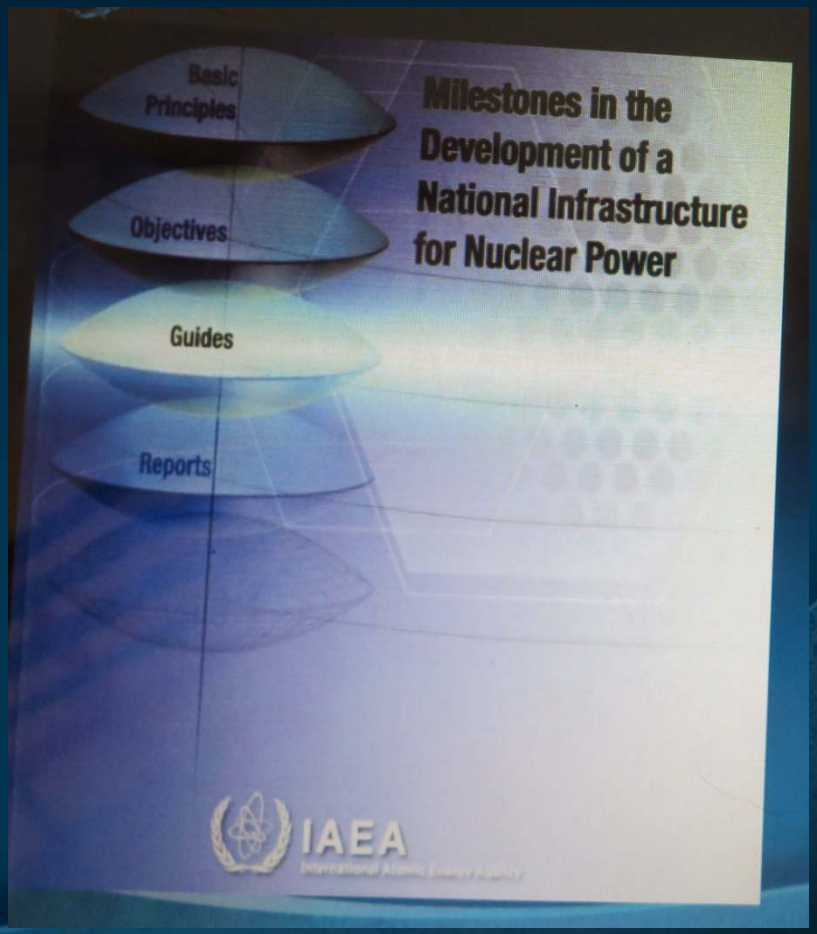
More…

Nuclear Power

In the Philippine Energy Plan, there is a window for nuclear power in a low carbon scenario, by 2030 (postponed 5 years after Fukushima Accident)

NRD for Nuclear Power

- Under the Inter-Agency Core Group on the Study of Nuclear Power as a Long Term Energy Option for the Philippines (precursor of the NEPIO), an HRD Plan for Nuclear Power is being prepared.



More…

HRD Strategy for Nuclear Power

- If the next NPP will be a turnkey project, it is not planned to develop all the competencies for the design, construction and commissioning

- Many competencies required during Phases 1 & 2 of the IAEA Milestones document could be contracted out or international/bilateral assistance could be availed of

More…

HRD Strategy for Nuclear Power

- The Philippines will focus on competencies needed by the regulatory body and competencies to operate and maintain the plant to ensure nuclear safety
- In Phase 1, the NEPIO will be mostly responsible for many of the activities
- At Phase 2, most of the activities will be done by the regulatory body and the operator
- At Phase 3, the operating organization will be responsible for the management of construction; the regulatory body will have activities of the licensing of the plant and overseeing the construction

More…

HRD for Nuclear Power

- Under the Inter-Agency Core Group on Nuclear Energy (precursor of NEPIO), PNRI works with:
  - Department of Energy (DOE)
  - National Power Corporation
  - Other agencies under the DOE

- Necessary infrastructure (IAEA Milestones document NG-G-3.1) for a future nuclear power programme is being prepared

More…

HRD for Nuclear Power

- Inter-Agency Core Group made a preliminary assessment of human resources and the necessary training needed in the 19 infrastructure areas for Phase 1 of a nuclear power programme, based on IAEA NG-T-3.3 “Workforce Planning for New Nuclear Power Programmes”

More…

National Education System for NPP

- Organizations involved:
  - Regulatory Body
  - Operating Organization (NP Utility)
  - Government (NEPIO)
  - Nuclear institutes/agencies
  - Universities
  - Technical Support Organizations
  - Industries
  - Public (public info, HS education)

More…

National E & T System for NPP

- Diverse disciplines are to be developed in the national education system for NPP:
  - Energy Planning
  - Nuclear Law
  - Geology and siting of NPPs
  - Environmental Impact Assessment
  - Project management
  - Nuclear engineers
  - Mechanical , chemical, civil engineers with nuclear safety training
  - Training in communication
  - Training for support industries (NDT, etc.)

More…

Challenges in HRD for NPP

- Absence of a national position on nuclear power greatly hinders HRD for nuclear safety infrastructure for NPP
- NEPIO still has to be established in the Philippines (Inter-Agency Core Group on Nuclear Energy is a NEPIO precursor)
- Utility or operator has to be designated as early as possible, in order to start HRD in operating organization.

More…

Challenges for HRD in Regulatory Body

- Staff of the Regulatory Body in the Philippines are ageing; recruitment & training of new personnel should be strongly supported by the government
- Training of regulatory staff will greatly benefit from international/regional cooperation.
- Knowledge management, in order to transfer knowledge from the more senior to junior staff.
- Challenges: need to introduce more courses on nuclear safety at the PNRI Nuclear Training Center.

More…

Challenges for HRD in Utility/Operator

- After the national position on NPP is promulgated, there is need to designate the utility/operator of the NPP.
- Challenge in the Philippines; the utility/operator of NPP has to be designated
- Training of human resources for the utility/operator can be supported by the NPP supplier

More…

Challenges for HRD in Universities

- Nuclear safety courses in universities would attract more students if the national position on a nuclear power program has been promulgated
- Lack of lecturers in nuclear science and nuclear engineering topics, need to train faculty
- M.Sc. Nuclear Engineering program at the University of the Philippines was stopped when the Bataan Nuclear Power Plant was mothballed; ongoing initiatives to revive it.
- Only a few universities include topics on nuclear power in the engineering curricula

More…

E & T for Industries in Support of NPP

- Inventory of industries to be developed in support of a nuclear power programme still has to be conducted.
- Needs for E&T in these industries still have to be identified
- The PNRI conducts NDT training courses in cooperation with the Philippine Society for Nondestructive Testing, Inc. (PSNT).
- NDT practitioners undergo certification as Level 1,2 or 3 by the National Certifying Body for NDT.

More…

HRD for Nuclear Security

- PNRI handles the action plan for nuclear security
- PNRI links with the national security, intelligence, & other relevant agencies & together formulated the National Nuclear Security Plan
- PNRI avails of International cooperation and assistance for HRD in the area of nuclear security, safeguards, & non-proliferation (IAEA, U.S. DOE, Australia)

More…

International Cooperation for HRD

- Maximize benefits from international/regional cooperation in HRD, e.g., ANSN, RCA, FNCA, EC

- Avail of trainings offered by International organizations/regional training centers, e.g., IAEA, EC, MEXT, KAIST/KINS

More…

International Cooperation for HRD

- On-going Cooperation Agreement with the EC on upgrading the capability of the regulatory staff & TSO for nuclear power

- On-going Cooperation Agreement on HRD with JAEA

More…

Acknowledgement

Dr. Corazon C. Bernido

former Deputy Director

Philippine Nuclear Research Institute

Steering Committee (SC) Member, ANSN

More…


Maraming salamat po!
www.pnri.dost.gov.ph