ESTABLISHMENT OF A NATIONAL RADIATION PROTECTION INFRASTRUCTURE: THE PHILIPPINE EXPERIENCE

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Historical Development

The bilateral agreement between the Philippines and the United States of America which came into force in 1955 marked the advent of nuclear science and technology activities in the Philippines. Under the agreement, the United States Government was to provide a research reactor while the Philippine Government was to provide the manpower and the building for the research reactor facility. This initial activity was followed with the passage of Republic Act 2067 creating the Philippine Atomic Energy Commission (PAEC), the precursor of the Philippine Nuclear Research Institute (PNRI). The PNRI is one of the research and development institutes under the Department of Science & Technology. Under the law the PAEC then, now the PNRI performs dual role of promotion and regulation. In 1959 the Philippines became a member of the International Atomic Energy Agency (IAEA).

Created by Presidential Decree (PD) 480 in 1976 and amended by PD1372 is the Radiation Health Service under the Department of Health. The PNRI is the Regulatory Authority for all matters concerning nuclear energy, regulating radioactive materials and related applications of ionizing radiation, while the Department of Health is responsible for regulating x-ray facilities and radiation which is generated electronically, including non-ionizing radiation.

The Philippines first nuclear research facility includes the country's only research reactor, the PRR-1, which became critical for the first time in1963. From the early 1960's to the 1970's, research and manpower training activities in nuclear energy applications became the main thrusts of the PNRI. The reactor conversion into a TRIGA type was initiated in March 1982 and the TRIGA Converted Reactor became critical in February 1988. Soon after in the same year, the PRR-1 has been shut down when the reactor pool lining developed a leak. PNRI engineers attempted to repair the reactor and half the high power section of the reactor pool was relined in 1992 but the deterioration of the pool lining was far more extensive than was originally estimated. As a consequence, the reactor is still shut down after more than 10 years of repair works. In March 1999, fifty-one (51) fuel assemblies of mixed enrichment from the PRR-1, consisting of 50 spent and 1 fresh were shipped to the United States under the U.S. Return of Foreign Research Reactor (FRR) fuel policy.

The decision to construct the first power plant was made in the 1970's and actual construction began in 1979. However, as a result of the change in government and the aftermath of the Chernobyl accident in 1986, the Philippine Nuclear Power Plant (PNPP) which was then ready for operation was mothballed. At the height of the severe power crisis in the early 1990's, attempts were made for a settlement with Westinghouse for upgrades of PNPP and its eventual operation. Unfortunately, these efforts failed. Finally, the fate of the PNPP was sealed with the approval in November 1997 of its conversion into alternative utilization for power generation using natural gas. In December 1997 the National Power Corporation shipped out the unirradiated uranium fuel to the buyer, Siemens Power Corporation, in the United States.

Philippine Research Reactor (PRR-1)

The Philippines' first nuclear research facility includes the country's only research reactor, the PRR-1, which became critical in 1963. The PRR-1 became the principal facility for many research and manpower activities in the field of radioisotope production, neutron spectrometry, neutron activation analysis and reactor physics. From 1966 up to the early 1970's, routine production of some 30 radioisotopes and labeled compounds was undertaken. The PRR-1 became the training ground for students and new graduates in the natural sciences and engineering, and the operators of the mothballed nuclear plant. Technical data on the PRR-1 are shown in Table 1.

Table 1. Philippine Research Reactor (PRR-1)

Facility Name	PRR-1
Location	Quezon City
Owner	Philippine Nuclear Research Institute
Operator	Philippine Nuclear Research Institute
Licensing Authority	Philippine Nuclear Research Institute
Construction Started	01/01/96
First Criticality	26/08/1963
Reactor Conversion	March 1984
Criticality	April 1988
Status	Shutdown since 1988 for pool repairs
Reactor Type	Triga Converted
Steady State Power	3 MW
Pulsed Power	572 MW
Fuel	U-235 (19.7%enriched)
Moderator	H_2O, ZrH
Coolant	Light Water
Reflector	Graphite, H_2O

The PRR-1 has been shut down since 1988 when the reactor pool lining developed a leak. PNRI engineers attempted to repair the reactor and half the high power section of the reactor pool was relined in 1992 but the deterioration of the pool lining was far more extensive than was originally estimated. The reactor is still shut down.

Regulatory Infrastructure of PNRI

The Philippine Nuclear Research Institute (PNRI) performs the dual role of promotion and regulation. The organizational structure of PNRI is shown in Figure 1. The PNRI is the regulatory body for all matters concerning nuclear energy in the country. The Nuclear Regulations, Licensing and Safeguards Division (NRLSD), shown in Table 2, is the regulatory arm of the Institute. The basic laws authorized the regulatory body:

Table 2. NRLSD Organization

Licensing, Review and Evaluation	• reviews, evaluates applications for license • recommends regulatory sanctions for erring licensees • maintains program for ensuring effective regulatory • activities through dialogs with organizations • involved in radioactive materials
Standards Development	• formulates, updates, upgrades regulations, standards, • guides for radiation safety
Inspection and Enforcement	• inspects and audit licensees • enforces regulations
Safeguards	• fulfills international obligations such as Non-Proliferation treaty
Radiological Impact Assessment	• assesses impact/hazards of licensees' actions • assesses radiological impact of PNRI facilities • maintains preparedness for radiological accidents • conducts regulatory research

- To establish and issue regulations and orders with respect to atomic energy facilities and materials for the protection and health and safety of the workers and the general public; and to make inspections to insure compliance with such requirements.
- To issue licenses to qualified persons/users.
- To modify, amend, suspend, or revoke any license.
- To establish and issue regulations and orders for the safe transport of atomic energy materials and facilities
- To regulate and license the acquisition, distribution, and use of radioactive materials and for this purpose, to

issue and promulgate appropriate rules, regulations, or orders.

- To issue rules and regulations establishing standards and instructions to govern the shipment, possession, and use of radioactive materials, to protect health, minimize danger to life and property, promote national defense and security, or otherwise protect the general public.

Following the passage of R.A. 2067 in 1958, the first set of regulations governing the use of radioactive materials was established by the PAEC. About ten years later, R.A. 5207 was passed providing for the licensing of atomic energy facilities and atomic energy materials in anticipation of the establishment of nuclear power plants in the country.

PNRI Administrative Order No. 1 (Series of 1994) established the Code of PNRI Regulations (CPR). The CPR consists of the rules and regulations promulgated by PAEC and PNRI implementing the licensing and regulatory provisions of specific sections of R.A. 2067 as amended and R.A. 5207, as amended.

PART 0	PNRI as a Regulatory Agency and General Information
PART 1	Conduct of Personnel
PART 2	Licensing of Radioactive Material
PART 3	Standards for Protection against Radiation
PART 4	Rules and Regulations on Safe Transport of Radioactive Materials in the Philippines
PART 5	Reactor Site Criteria
PART 6	Rule of Procedure for the Licensing of Atomic Energy Facilities in the Philippines
PART 7	Licensing of Atomic Energy Facilities
PART 8	Atomic Energy Facility Operators' Licenses
PART 9	Physical Protection of Nuclear Power Plants and Materials
PART 10	Financial Security and Government Indemnity
PART 11	Licenses for Industrial Radiography and Radiation Safety Requirements for Radiographic Operations
PART 12	Licenses for Medical Use of Sealed Radioactive Sources in Teletherapy
PART 13	Licenses for Medical Use of Radiopharmaceuticals
PART 14	Licenses for Medical Use of Sealed Radioactive Sources in Brachytherapy
PART 15	Licenses for Large Irradiators
PART 16	Licenses for the Use of Sealed Sources Contained in Industrial Devices (draft 1999)

Several of these regulations are currently being reviewed and/or revised in line with our commitment to adopt the current International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS). A PNRI Task Force has been constituted to study the extent and practicability of adopting any or all provisions of the BSS in the revision of PART 3 and other relevant regulatory guidance documents; to coordinate the development and conduct of training programs on the BSS; and to ensure harmonization of radiation safety standards with the Radiation Health Service of the Department of Health.

Regulatory Infrastructure of DOH

The Department of Health (DOH) is responsible for registration and regulation services based on the Presidential Decree (PD): PD 480 as amended by PD 1372. The regulations administered by the DOH are given through Administrative Orders (AOs) in a hierarchical structure similar to that used in the CPR. The following is a list of AOs:

AO No. 124	Rules and Regulations Governing the Establishment, Operation and Maintenance of an X-Ray Facility in the Philippines (1992, for revision)
AO No. 35	Requirements for the Control of Radiation Hazards from clinical Diagnostic X-Ray Facilities (1994, for revision)
AO No. 2-A	Requirements for the Control of Radiation Hazards from Clinical Dental X-Ray Facilities (1996, for revision)
AO No. 40	Requirements for the Control of Radiation Hazards from Industrial and Anti-Crime X-Ray Facilities (1996)
AO No. 41	Requirements for the Control of Radiation Hazards from Clinical X-Ray Services Used in Veterinary Medicine (1996)
AO No.	Requirements for the Control of Radiation Hazards from Clinical Therapeutic X-Ray Units and Medical Linear Accelerator (draft 1999)

AO No. Requirements for the Control of Radiation Hazards from X-Ray Devices Used in Research, Education and Non-Medical purposes (draft 1999)

Environmental Aspects

In line with the global environmental concerns on sustainable development, the Philippines enacted into law R.A. 6969, also known as the Toxic Substances and Hazardous and Nuclear Wastes Control Act of 1990 with the Department of Environment and Natural Resources (DENR) as implementing agency. The law explicitly prohibits, among others, the entry, even in transit of nuclear wastes and their storage or disposal into the Philippine territorial limits for whatever purposes. States which are signatories to the Basel Convention and countries with bilateral agreements with the Philippines that would allow the passage or transit shipment of nuclear wastes over its territorial limit are exempted from the requirements of these regulations provided informed arrangements and notification schedules are complied with.

The law also provides that the regulation, control and management of radioactive materials and nuclear wastes generated in the country shall be the responsibility of the PNRI pursuant to its mandate under R.A. 2067 and R.A. 5207 and shall be governed by the relevant Code of PNRI Regulations. Any holder of a valid PNRI license, authorized to operate a nuclear power plant or radiation facility are also exempted from the requirements of these regulations. The law also provides for the constitution of an Interagency Technical Advisory Council, of which the PNRI Director is a designated member, specifically to provide technical advice on nuclear wastes.

Further to addressing the environmental related issues are the policy thrusts of government to integrate environmental concerns in the planning and implementation of energy related projects. Before any power related project can be carried out, detailed environmental impact studies have to be complied with and an Environmental Clearance Certificate has to be obtained from the Department of Environmental and Natural Resources.

PNRI Radiation Protection Services

- **Personal Monitoring**

PNRI is running a national film and TLD service, monitors about 6000 workers bimonthly by films and an additional 500 workers by TLD. About 600 film dosemeters are processed every week with the development, readout and data entry done manually. TLD dosemeters are processed with a Harshaw 6600 reader. Although the reader can be used to process the TLDs, data handling is performed manually due to continuing problems in making the Harshaw data manipulation software operational. Participation in international intercomparison programs is undertaken to ensure reliability and accuracy of measurements.

The major use of unsealed radioactive material is for medical applications. PNRI provides about 20% of the I-131 used in the Philippines for diagnostic and therapeutic purposes. The remainder is sourced from private commercial suppliers. A Biodex 930 uptake monitor and a thyroid phantom have been acquired last year through a technical assistance project from the IAEA. The PNRI has launched an internal monitoring service for all users of radioactive iodine…

- **Calibration**

PNRI and RHS (DOH) each have calibration facilities that are tied to the SSDL network which is jointly run by the WHO and the IAEA. A Memorandum of Agreement (MOA) have been entered into by the PNRI of the DOST and the RHS of DOH under the framework of a National SSDL Organization primarily to allow mutual participation in the SSDL Network as well as exchange of facility access including delineation of functions and responsibilities. Both SSDLs are traceable to a primary standard laboratory. Both SSDLs however, need strengthening in terms of radiation sources, physical infrastructure and manpower training

- **Radioactive Waste Management**

The PNRI through its Radiation Protection Services (RPS) has established, with technical assistance from the International Atomic Energy Agency a centralized facility for the management of low level radioactive wastes. PNRI has hosted two (2) Demonstration Courses for the IAEA, one from 30 November - 11 December 1998 and the second one in 1999 within the framework of the IAEA Model Project INT/4/131: Sustainable Technologies to Manage Radioactive Wastes- Demonstration of Pre-Disposal Waste Management Methods and

Procedures. The purpose of the training event would be to demonstrate to IAEA Member States in the East Asia and Pacific Region predisposal waste management methods and procedures which are documented in IAEA Technical Reports and Technical Documents. These are in agreement with internationally accepted standards and criteria, such as the BSS and RADWASS documents. The demonstration will combine theoretical knowledge through lectures with practical experience by giving 'hands-on' training in a real environment.

Radiation Protection Training

The PNRI through its Nuclear Training Institute offers core training programmes on radiation protection and radiation related applications. The courses are conducted nominally for 4 –40hr weeks. The first two weeks of each course presents the same core materials. The Radiological Health and Safety Course is general, while the Industrial Uses of Radioisotopes Training Course and the Radioisotope Techniques Training Course have application oriented emphasis. Additional on-site training courses may be designed upon request in fixed installations and where sufficient number of trainees justifies the time and effort in conducting on-site courses. In all cases, a training fee is charged to the employer.

DOH offers a separate programme of training courses for hospital staff with radiographic facilities. It is a requirement in the DOH regulations that facilities operating an x-ray equipment have trained RSOs as a condition to authorization.

Additionally, the Philippines is an active participant in the IAEA RCA Project on Distance Learning in Radiation Protection and has conducted trialling of the different modules in all the phases within the framework of the project implementation plan..

Current Policy Issues

Notwithstanding the developments surrounding the Philippine Nuclear Power Plant, a Nuclear Power Steering Committee (NPSC) was created in May 1995 by former President Fidel V. Ramos through the issuance of Executive Order No. 243. The NPSC was formed to provide policies, directions, monitoring, evaluation and other functions necessary and appropriate to attain the objectives of the overall nuclear power program, and to prepare the action plans, work programs and proposed timetables.

The NPSC is a multi-agency body headed by the Secretary of the Department of Energy (DOE) with the following government agencies as members: Department of Science & Technology (DOST), Department of Environment and Natural Resources (DENR), Department of Education, Culture and Sports (DECS), Department of Justice (DOJ), National Economic and Development Authority (NEDA), Office of the Press Secretary (OPS), National Power Corporation (NPC), Philippine Nuclear Research Institute (PNRI) and the Office of the President (OP).

The NPSC has eight (8) subcommittees with the corresponding chairs namely:

- siting study, NPC
- radioactive waste management, PNRI
- nuclear related legislation, DOJ
- nuclear manpower development, DOST
- nuclear power public education and information, DECS-CHED
- R&D programs on nuclear safety and nuclear fuel cycles, PNRI
- feasibility study on nuclear power plant operation, NPC and
- feasibility studies on nuclear reactor design alternatives, NPC

In the short term the NPSC established priority activities including the review and assessment of available manpower and their skills levels, potential sites, environmental and health impacts of nuclear power, gathering new data related to plant operations, reactor designs, rules & regulations and public education & information initiatives.

Siting Studies for Radioactive Waste Management

The functions of the subcommittee on Radioactive Waste Management are: (a) to study and identify sites for final radioactive waste disposal, (b) to conduct studies on the development of processes and methods to

dispose radioactive waste, and (c) to undertake steps for the eventual establishment of a National Radioactive Waste Management Center. With the Philippine Nuclear Research Institute as the lead agency, the others were designated from the Department of Energy, The Department of Environment and Natural Resources, the Department of Science & Technology, the National Power Corporation, and the Office of the President.

The subcommittee has reviewed the short list of candidate sites recommended by the previous Technical Working Group against an updated and revised site selection criteria and rating classification scheme and concluded that the previously recommended candidate sites are no longer acceptable. The subcommittee took into consideration worldwide developments in siting disposal facilities and also major events which have recently taken place in the country in the revision of the site selection criteria and the rating classification scheme. The subcommittee is presently engaging a group of consultants to assist in the site screening process on a national scale, as this involves the integration of a wide range of technical, environmental, social and economic factors. The expected output in the near term is the identification of a short list of candidate sites which will be subjected to further investigation, e.g., site specific studies. It is also expected that exclusion, avoidance and preference criteria will be established to be used in the next stage, i.e., site evaluation.

The PNRI through the RPS has successfully participated in the three year IAEA Coordinated Research Program on Treatment Methodologies for Low Level Wastes from Small Nuclear Applications. RPS has participated and presented technical papers covering national strategies and operational experiences on low level radioactive waste management. PNRI has actively participated in a number of expert missions, advisory & consultancy meetings in radioactive waste management organized by the IAEA which has resulted in the publication of a number of technical documents in low level waste and spent sealed source management.

Research and Development Program on Nuclear Safety

The SubCommittee for Research and Development on Nuclear Safety under the NPSC is conducting studies on comparative environmental impacts of local electricity generating plants and prospective nuclear power stations. The general objective of this project is to develop a methodology for the comparison of environmental impacts of Philippine electricity generating plants. The main focus is to develop a methodology for assessing and comparing the environmental impacts arising from all emissions of electricity generating systems in the country. This project hopes to present some preliminary conclusions to determine the best mix of electricity generating systems for the country taking into account environmental considerations.

Preliminary comparative analyses were undertaken with the databases provided by the Environmental Manual software. A survey questionnaire designed for coal, geothermal, oil and hydrothermal power plants was developed and distributed to the different power plants to gather the necessary data for the study. For the development of the methodology, the draft document General Guidelines for the Comparative Assessment of Health and Environmental Impacts of Electrical Energy Systems was used. This document was prepared at the IAEA Technical Committee Meeting held in May 1996 in Vienna.

Radiological Emergency Planning and Preparedness

The ultimate objective of the project activities being undertaken in this field is the protection of public health and safety against radiological hazards from all sources due to radiological emergencies which may lead to widespread radioactive contamination of man and his environment. The project also aims to ensure preparedness of the PNRI and other concerned national agencies as well as the general public in case of a radiological emergency, including that which may arise in the operation of a nuclear power plant. Various research activities are also being carried out in support of radiological emergency preparedness.

Current activities are centered on the development of implementing procedures by the different member agencies following the review of the National Radiological Emergency Preparedness and Response Plan (RADPLAN) by the National Disaster Coordinating Council (NDCC) through its Committee on Radiological Emergency (CORE). The NDCC is chaired by the Secretary of National Defense. Also being undertaken are training seminars, workshops and similar activities designed to provide skills training and to enhance the technical capability of the various action/response teams constituted in accordance with the national emergency plan.

The Philippine Energy Plan (PEP)

The long term energy demand and supply forecasts for the country are contained in the Philippine Energy Plan (1998 - 2035), which updates the 1996 - 2025 Plan, both prepared by the Department of Energy (DOE). The DOE conducts a series of consultations with other energy industry participants in order to forecast the overall demand and supply situation, accounting for the contribution of other power generators and the transmission expansion plan of distribution utilities and electric cooperatives. The plan includes the Power Development Program (PDP) of the National Power Corporation (NPC) and the plans of upstream development by the Philippine National Oil Corporation (PNOC) and electrification by the National Electrification Authority (NEA).

About 57,000 MW capacity addition will be required for 1998 - 2005. From 1997 to 2010, the share of indigenous energy increases significantly due to additional capacity from geothermal steam, hydropotentials and natural gas reserves. Wider use of coal from the 293 MW mineable reserves will be undertaken. The window for local coal will start in 2006. The optimal utilization of these indigenous resources will result in about 50% of the expected capacity required for the period 1998 - 2025.

The new and renewable energy (NRE) capacity additions count to 31 MW for 1998 growing to more than 4,000 MW by 2025. Imported energy will account for at least 28,000 MW of electricity, 24,000 MW of which was identified with imported coal, oil and a prudent 600 MW for nuclear power in the 2021 - 2025 period. The 24,000 MW could also be the window of opportunity for the ocean, solar and wind energy systems.

The opportunity for nuclear power as a component of the Philippines' future energy mix hinges heavily on the public acceptance issue. Thus, the NPSC has given the highest priority to activities that improve the positive perception of the public towards nuclear power as an economically viable, safe and clean technology.

International and Bilateral Agreements and Cooperation

The Philippines has been a member of the IAEA since September 2, 1958 and since then, has availed itself of Agency support through its Technical Cooperation program, including a number of projects specifically dealing with nuclear safety and radioactive waste management.

The status of the Philippine position with regards to International Agreements on Nuclear Safety is shown below:

Agreement on Privileges and Immunities	Entry into force: 17 Dec 1962
NPT	Entry into force: 4 Oct 1972
NPT related safeguards agreement INF/CIRC No. 216	Entry into force: 16 Oct 1974
Supplementary agreement on provision of nuclear material	Entry into force: 3 March 1980
Convention on physical protection of nuclear materials	Entry into force: 8 Feb 1987
RCA	Entry into force: 30 August 1987
Joint Protocol	Signature: 21 September 1988
Basel Convention: Control of Transboundary Movements of Hazardous Wastes and their Disposal	Signature: 22 March 1989
Chemical Weapons Convention	Jan 1993
Convention on Nuclear Safety	Signature: 14 Oct 1994

Improved procedures for designation of safeguards inspectors	Accepted on 7 Feb 1995
Treaty on the Southeast Asia Nuclear Weapon-Free Zone	15 Dec 1995
Comprehensive Nuclear Test Ban Treaty	10 Sept 1996
Convention on early notification of a nuclear accident	Entry into force: 5 June 1997
Convention on mutual assistance in the case of a nuclear accident or radiological emergency	Entry into force: 5 June 1997
Additional Protocol (Text:GOV/2954)	Signature: 30 Sept. 1997
Vienna Convention on Civil Liability for Nuclear Damage	Entry into force: 12 Nov 1997
Protocol to amend the Vienna Convention on Civil Liability for Nuclear Damage	Non-Party
Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	Non-Party
ZANGGER Committee	Non-Member
Nuclear Export guidelines	Not adopted
Acceptance of NUSS Codes	No reply

The Philippines took exception to the fact that unlike the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management failed to make explicit provision for prior notification and the consent of Transit States with regard to transboundary movements of such wastes.

The Philippines has entered into a number of bilateral agreements; to wit:

- Memorandum of Understanding Between the Philippine Nuclear Research Institute and the Australian Nuclear Science and Technology Organization for the Exchange of Technical Information and Cooperation in Nuclear Technology- March 17,1993
- Memorandum of Understanding Between the Indonesian Atomic Energy Agency and the Philippine Nuclear Research Institute on the Exchange of Technical Information and Cooperation in Nuclear Technology Matters - November 28,1994
- Technical Cooperation Agreement Between the Philippine Nuclear Research Institute and the Atomic Energy Of Canada, Ltd. - November 9,1995
- Memorandum of Understanding Between the Philippine Nuclear Research Institute and the Korea Atomic Energy Research Institute - November 10,1994
- Agreement Between the Government of the Republic of the Philippines and the Government of the Republic of Korea for Cooperation in the Peaceful Uses of Nuclear Energy - November 10,1994
- Memorandum of Understanding Between the Pakistan Atomic Energy Commission and the Philippine Nuclear Research Institute in the Field of Peaceful Uses of Atomic Energy - March 8,1997
- Agreement with STA, Japan

Concluding Statements

Concomitant to the economic growth of the East Asia region is the increased need for energy to fuel the growth. Energy policy, however, is no longer resource driven. The concern for the environment is a major

factor that drives national energy policy. The issue is that energy supply must satisfy not only the demand for energy but also the need to protect and preserve the environment. This imposes a constraint in the energy mix. We can no longer address the energy supply issue by simply looking for energy sources to exploit and develop in order to sustain power generation transportation and energy. We must include environmental variables in energy production and power generation calculations. Mechanisms to eliminate or minimize potentially toxic and hazardous elements related to power generation or petroleum refinement must be seriously included.

Various scenarios which have been worked out show that significantly less CO_2 emissions would result from a global energy mix in which nuclear power formed a greater part than is currently the case. For this reason, nuclear energy is seen as one of the viable energy options to meet the energy needs of the region. The ASEAN countries still have to operate a nuclear power plant and those that are considering the nuclear option are at varying levels of implementation of their nuclear power programs. But even while no ASEAN country has an operating nuclear power plant, the countries in the region are already confronted with concerns related to nuclear safety and nuclear waste management and transport of nuclear wastes because of operating nuclear power plants in the region.

Cognizant of these concerns, the Philippines proposed the establishment of an ASEAN regional cooperation on nuclear safety and nuclear waste management in 1996 at the 1st ASEAN Informal Summit held in Jakarta and reiterated the proposal in 1997 at the 2nd ASEAN Informal Summit held in Kuala Lumpur. The ASEAN Expert Working Group Meeting on Nuclear Safety and Nuclear Waste Management hosted by the Philippines and held at the PNRI in August 1998 was a first step to implement the Philippine initiative. As risks and hazards associated with nuclear technology application could cut across national boundaries, ASEAN exposure to nuclear risk cannot be ignored even if nuclear activity in ASEAN is limited in scope. It might be worthwhile for ASEAN to create a realistic perception of the facts and the understanding of the problems it faces in the light of the economic developments in the Pacific Rim and the current financial crisis in Asia.

A regional cooperation in nuclear safety and nuclear wastes management would be extremely useful in establishing baseline data on ASEAN capability in nuclear technology, including expertise, facilities, funding, programmes, existing legal and regulatory framework and nuclear accident preparedness, in contributing information and analysis on the socio-economic, health and environmental impacts of the nuclear energy option and more importantly, in exploring possible initiatives and agreements that could be undertaken; among others, on joint R&D and human resources development, and intra-ASEAN early notification of nuclear accidents and mutual assistance during nuclear emergencies.

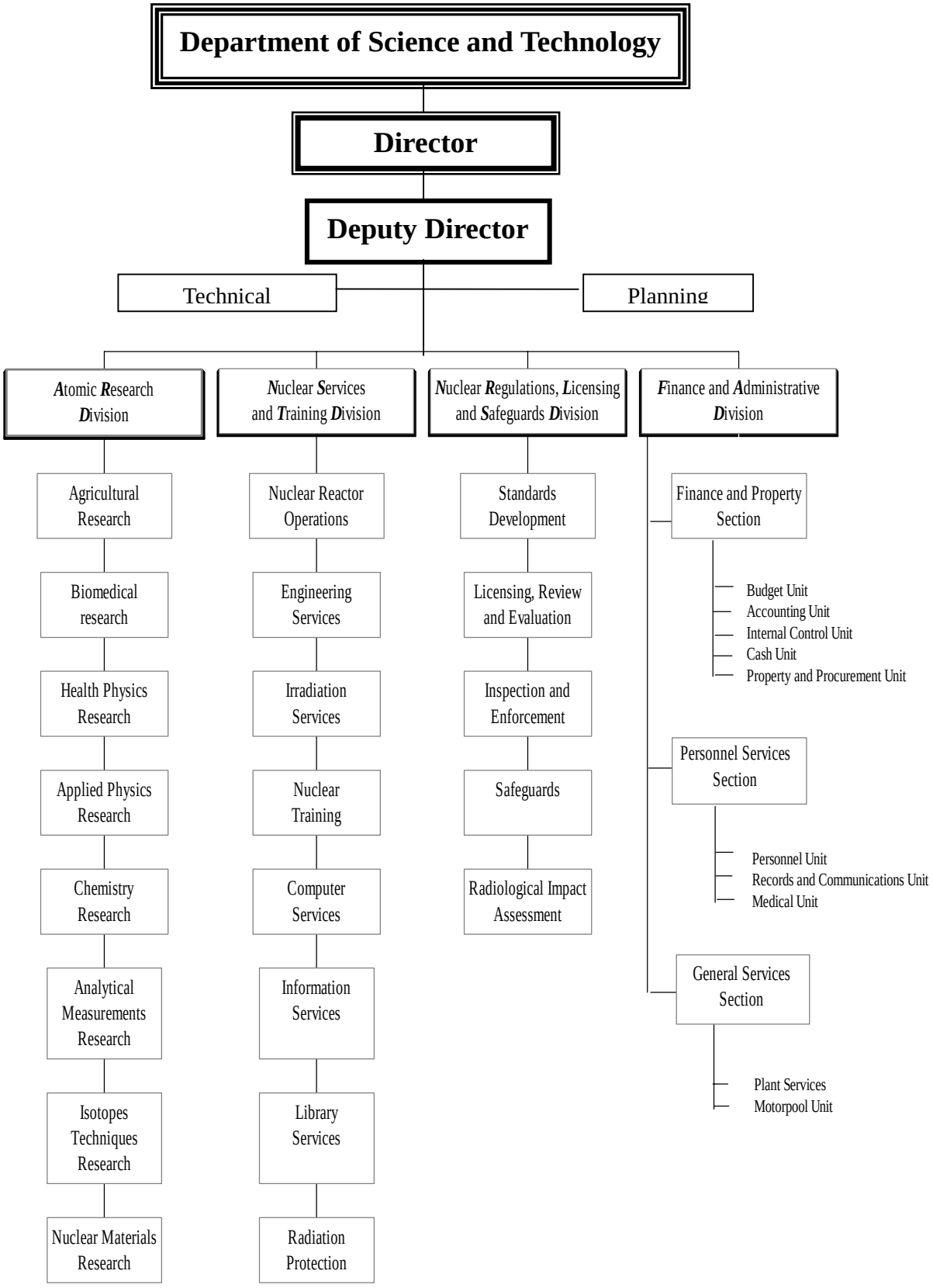

Figure 1. PNRI Organizational Chart