

Summary of ANTEP Needs 2010 (As of July, 2010)

	Bangladesh	Indonesia	Malaysia	Philippines	Thailand	Vietnam	TOTAL
A. Radiation Safety and Radioactive Waste	0	6	4	3	5	6	24
B. Radiation and Isotope Application	1	5	10	8	11	2	37
C. Research Reactor	4	1	20	2	4	1	32
D. Nuclear Power Reactor	0	4	13	4	5	4	30
E. Nuclear Administration	0	0	4	2	2	0	8
F. Others (Nonproliferation, Safeguards, etc)	0	0	2	2	1	0	5
TOTAL	5	16	53	21	28	13	136

ANTEP Needs 2010 (As of July, 2010)

Needs Category

ANTEP: Needs expect to be fulfilled in international cooperation frameworks

Domestic: Needs that can be fulfilled in domestic frameworks

No.	Outline	Specification	Type of Training	Duration	Needs Category
A. Radiation Safety and Radioactive Waste					
1	Radwaste Disposal-Sorption and Diffusion Experiments (Indonesia)	- Study on Sorption and Diffusion of Radionuclides on Clay Mineral Used for Nuclear Waste Disposal - Radioisotope laboratory	Lecture, OJT, Experiment	3 months	ANTEP
2	Siting of Radwaste Disposal Facility (Indonesia)	Preparation of Siting Program for Near Surface Disposal Facility	Lecture, OJT	3 months	ANTEP
3	Radwaste Disposal - Safety Assessment of Radwaste Disposal Facility. (Indonesia)	Application of Computer Code for Safety Assessment of Radwaste Disposal Facility	Lecture, OJT	3 months	ANTEP
4	Spent fuel management (Indonesia)	- Solid Waste management, including control, collect, separation, treatment, and storage - Gaseous and liquid radioactive Waste reduction - Testing and calibrating radwaste analysis array.	Lecture, OJT, Experiment	3 months	ANTEP
5	Decommissioning (Indonesia)	Some important researches needed: - Development of decommissioning program - Planning and performing decommissioning activities - Implementation of decommissioning techniques - Creating dismantling procedures - Management of radioactive waste arising from decommissioning activities - Estimating resources required and cost of a decommissioning project.	Lecture, OJT, Experiment	6 months	ANTEP

6	Chromosome Aberration Analysis as biodosimetry for Radiological Emergency Preparedness (Indonesia)	Analysis of chromosome aberration as biological dosimetry in radiological emergency preparedness, from establishing standard curves of chromosome aberrations up to estimating radiation dose. Instruments: BBC level ii, CO" incubator, centrifuge, waterbath, microscope imaging systems and fluorescence microscope	Lecture, OJT, Experiment	12 months	ANTEP
7	Radioactive Waste Management for NPP (Malaysia)	To train and acquire basic knowledge and concepts of HLW management. Understanding of typical deep geological disposal facility including and handling and storage of spent fuel.	OJT, Lecture	3 months	ANTEP
8	Emergency Preparedness & Response (Malaysia)	To acquire knowledge on various aspects of emergency preparedness and response: * Understanding of IAEA guidelines and International Nuclear Emergency Scale * Appreciation of preparedness and response function * Local emergency preparedness and response team organization * Generic Intervention Levels *- Generic Action Levels * Emergency Worker Guidelines/Guidance * Operational Intervention Levels * Urgent Protective Action*- Emergency Management & Decision making techniques * Technical preparedness and response	Lecture & OJT	3 months	ANTEP
9	Operational Radiation Protection & Dose Record (Malaysia)	Health Physics Operational Control & Characteristics	Lecture & OJT	3 months	ANTEP
10	Environmental & Reactor Effluent Monitoring (Malaysia)	Reactor Gaseous Effluents and Liquid Effluents monitoring Monitoring of radio-nuclides in the environment	Lecture & OJT	3 months	ANTEP
11	Emergency preparedness and Response (Philippines)	To acquire hands-on experience on emergency response that will enhance the capability for radiological dose assessment to a given emergency situation	Lecture, Research, and OJT	1-3 months	ANTEP
12	Radiation Safety Program for Nuclear Power Plan (Philippines)	To acquire and enhance knowledge and skills on the various elements of radiation safety in nuclear power plant	Lecture and OJT	3 months	ANTEP

13	Contaminant Transport in Fractured Media (Philippines)	To gain knowledge and expertise in modeling contaminant flow and transport in fractured media in support of safety and performance assessment of radwaste disposal	Research and OJT	3 months	ANTEP
14	Radiation Safety System design and Radiation Control in Nuclear Facilities (Thailand)	To set up the radiation safety system for the new research reactor and other new radiation facilities in Ongkarak Province.	Training/ Lecture/ Research	3 months	ANTEP
15	Development of Radiation Instrument (Thailand)	To enhance the engineering knowledge in development the radiation instrument using the hi-technology	Training	3-6months	ANTEP
16	Radiation Protection (Thailand)	To enhance the manpower in radiation protection knowledge and skills	Training	1 week	Domestic
17	Waste Management (Thailand)	To transfer waste management knowledge (included the waste management law) to the hospital, research institute and industrial	Training	1 week	Domestic
18	Nuclear Instrument Maintenance (Thailand)	To provide the nuclear instrument maintenance techniques to the industrial sector and research institute.	Training	1 month	Domestic
19	Emergency preparedness (Vietnam)	To acquire knowledge which will help to implement NSRC Act and Rules-1997 properly through licensing, inspection and enforcement	Lecture, Research, OJT	3 months	ANTEP
20	Radiation Safety (Vietnam)	To acquire knowledge and experience on radiation safety in the field of research and power reactor, industry and health	Lecture, Research, OJT	3 months	ANTEP
21	Radiation measurements (Vietnam)	To acquire knowledge and experience on radiation measurements to be applied in training courses	Lecture, Research, OJT	2 weeks	Domestic
22	Neutron Dosimeter (Vietnam)	To acquire knowledge in implementing personal neutron dosimetry in Vietnam in future	OJT	3 months	ANTEP
23	Health physics – Biological effects of radiation on human body (Vietnam)	To acquire knowledge and experiences in study on biological effects of radiation on human body	OJT	3 months	ANTEP
24	Radioactive waste management (Vietnam)	To acquire knowledge and experiences in study on radioactive waste management in the future	OJT	6 months	ANTEP

B. Radiation and Isotope Application					
25	Hiking of crop quality and production by Mutation Technique and Biotechnology (Bangladesh)	To provide knowledge on mutation, genetic diversity, breeding, etc.	OJT, Lecture, Research	3-6 Months	ANTEP
26	Studies on microbiological aspects of irradiated food (Indonesia)	1. - Determining microorganism and their product in food, 2. - Microorganism indicator of food safety and quality 3. - Food borne disease	experiment (lab-work)	6 months	ANTEP
27	Synthesis and Characterization of rhenium complexes as rhenium-186/188 radiopharmaceuticals (Indonesia)	- synthesis of ligands followed with the formation of rhenium complexes containing ligand synthesized - characterization of the legends and the rhenium complexes using chemical instrumentations of spectroscopy and chromatography - conversion of the synthesis method to preparation of rhenium-186/188 radiopharmaceuticals using the legend synthesized.	experiment (lab-work)	6 months	ANTEP
28	Cyclotron Maintenance (Indonesia)	- Adjustment of central region of cyclotron - Creating and focusing beam current - Maintenance of cyclotron vacuum system	Lecture, JOT, Experiment	6 months	ANTEP
29	Small-angle Neutron Scattering (SANS) Study on Hierarchical Structures, Function and Self-assembly Mechanism in Bio-macromolecules System (Indonesia)	Neutron source (reactor), Neutron scattering laboratory, Small-angle Neutron Scattering (SANS) Spectrometer, Sample Preparation Laboratory.	JOT	12 months	ANTEP
30	Detection of Single Nucleotide Polymorphism (SNIP) as Radiosensitivity Biomarker of Cervical Cancer (Indonesia)	SNIP (Single Nucleotide Polymorphism) analysis's the radio sensitivity biomarker of cervical cancer in order to increase radiotherapy ratio. Instruments: BSC level ii, PCR machine, electrophoresis and imaging systems, microarray analysis.	Lecture, OJT, Experiment	12 months	ANTEP

31	Irradiation Test of Nuclear Fuels and Materials (Malaysia)	1. Laboratory attachment on research related to the study of material damage due to irradiation 2. Hands on training on testing the integrity of nuclear fuel 3. Nuclear materials aging and degradation effect study	OJT	4 months	ANTEP
		Understanding method available to assess fuel integrity	OJT, Lectures	3 months	ANTEP
		Test and evaluation of radiation effects on polymeric materials used in Nuclear Power Plants including the development of Polymeric Compounds for Neutron & Gamma Shielding in Nuclear Power Plant and Irradiation Facility Application	Research attachment And Dispatch of expert	3 - 6 months for attachment /1-2 weeks for expert	ANTEP
32	R&D for Graft Polymerization onto Natural Polymers (Malaysia)	Research on radiation induced graft polymerization onto natural polymer and Analysis of relationship between grafting conditions and grafted chains detached from trunk polymers	Research attachment And Dispatch of expert	3 - 6 months for attachment /2-4 weeks for expert	ANTEP
33	Development of Highly Selective Ion Adsorbents by Graft Polymerization (Malaysia)	Research on synthesis of adsorbents for hard-to-adsorb ions by radiation induced graft-polymerization and their evaluation	Research attachment And Dispatch of expert	3 - 6 months for attachment /2-4 weeks for expert	ANTEP
34	Modification of Biodegradable Polymers by Radiation Processing (Malaysia)	Research on improvement of mechanical, thermal property and so on for environment friendly polymers by using radiation processing technique and their application	Research attachment And Dispatch of expert	3 - 6 months for attachment /2-4 weeks for expert	ANTEP
35	Development of Polymer Electrolyte Membranes for Fuel Cells using Radiation Technique (Malaysia)	Synthesis and characterization of high performance polymer electrolyte membranes by radiation-induced cross-linking and graft polymerization using electron beams and gamma rays Study on nanostructures, ion conducting mechanism, and degradation behavior of polymer electrolyte membranes	Research attachment And Dispatch of expert	3 - 6 months for attachment /2-4 weeks for expert	ANTEP
36	Development of Multifunctional Composite Materials (Malaysia)	Research on multifunctional polymeric composite material that will provide shielding from radiation and has ballistic property.	Research attachment And Dispatch of expert	3 - 6 months for attachment /1-2 weeks for expert	ANTEP

37	Ecological Impact Study and Monitoring of Ecosystem in relation to Nuclear Power Programme (Malaysia)	To advise on national programme on Ecology Impact Study and monitoring of Ecosystem in relation to Nuclear Power Program To give talks on Recent development in radiation effects on biological system with respect to nuclear facilities (e.g. nuclear reactor, gamma greenhouse) especially on low level radiation effects and to advice on related experiments to be conducted.	Dispatch of Experts – Lecture and Experiments	2 weeks	ANTEP
38	Comparative Study on Impact of NPP and fossil fuel power plant on the Ecosystem (Malaysia)	To study and understand the behavior of radionuclide in the ecosystem. To study on the radiation effect in selected plant and fauna. Impact of radio nuclides in fly ash from coal power plant	Research	3 to 6 months	ANTEP
39	Radiological effects on microbial population (Malaysia)	Screening of low dose irradiation effects in microorganisms Assessing impact of radiation and radionuclides in microbial distribution	Research	3 to 6 months	ANTEP
40	Radiation effects at molecular level (Malaysia)	Screening of low dose irradiation in fungi and mushroom Assessing impact of radiation and radionuclides in fungi and mushroom.	Research	3 to 6 months	ANTEP
41	Dosimetry of Gamma and Electron Beam Facilities (Philippines)	To acquire knowledge in the process control of gamma and electron beam facilities	OJT	3 months	ANTEP
42	Operation and Maintenance of Gamma and Electron Beam Facilities (Philippines)	To acquire knowledge in the operation and maintenance of gamma and electron beam facilities	OJT	3 months	ANTEP
43	Environmental Isotopes Applications (Philippines)	To acquire and enhance knowledge on the application of environmental isotopes in environmental assessments	Research	3 months	ANTEP
44	Environmental Applications in Chemistry (Philippines)	To acquire knowledge on risk assessment, contaminant profiling and source fingerprinting	Research and OJT	3-6 months	ANTEP
45	Radiation Bioscience (Philippines)	To do biological research concerning the improvement of radiation therapy	Research and OJT	8-12 months	ANTEP
46	Instrumentation I (Philippines)	To acquire knowledge in the development of PC-based control system for automation of electromechanical equipment and counting system	Lecture and OJT	3 months	ANTEP

47	Instrumentation ii (Philippines)	To acquire knowledge on data acquisition systems and digital signal processing for counting systems	Lecture and OJT	3 months	ANTEP
48	Soil-Plant Relationship Using Nuclear Techniques (Philippines)	To acquire knowledge on how nuclear techniques may be used in soil-plant relationship	OJT	3 months	ANTEP
49	Method validation (Thailand)	To refresh the method validation knowledge and techniques to manpower in radioisotope center. (support the GMP process)	Lecture	1 week	Domestic
50	Non-Destructive Testing (Thailand)	To provide the NDT knowledge to manpower in industrial sector	Lecture	1 week	Domestic
51	Gamma Spectroscopy (Thailand)	To enhance the Gamma Spectroscopy technique to the researcher in R&D center.	Training	1 week	Domestic
52	PET Pharmaceutical or related field (Thailand)	To enhance the capacity in synthesis module, preparation irradiated target for PET	Training/Research	3-6 months	ANTEP
53	Electron Accelerator Application in plant breeding (Thailand)	To enhance the Electron Accelerator utilization in R&D field. (The E-Beam will complete the set up by the year 2010)	Research	3-6 months	ANTEP
54	Electron Accelerator Application in material science (Thailand)	To enhance the Electron Accelerator utilization in R&D field. (The E-Beam will complete the set up by the year 2010)	Research	3-6 months	ANTEP
55	The maintenance of Electron Beam Accelerator (Thailand)	To provide the knowledge in E-Beam maintenance. (support the E-Beam set up)	Training	1 month	Domestic
56	Radiation measurements and detection (Thailand)	To enhance radiation protection manpower's capacity in measurement/evaluation technique on monitoring and data interpreting.	Research/Training	6-12 months	ANTEP
57	Study on Production of Biological Radioisotopes (Thailand)	To enhance the production and Q.C. technique in Biological Radioisotope	Research	6-12 months	ANTEP
58	Isotope Hydrology for environmental management (Thailand)	To provide the isotope hydrology for environmental management technique to the research institute and ministry of environment.	Training	1 week	Domestic

59	Bio-fertilizer (Thailand)	To develop bio-fertilizer technique	Research	6-12 months	ANTEP
60	Isotope Application for study environment (Vietnam)	To acquire knowledge and experience for carrying out study on climate change	OJT	3 months	ANTEP
61	Non Destroyed Evaluation (NDE) (Vietnam)	To acquire knowledge and experience for carrying out study on NDE field for NPP construction in the future	OJT	3 months	ANTEP
C. Research Reactor					
62	Development in Material for Research Reactor Nuclear Fuel (Indonesia)	Material engineering to create a reliable for material for nuclear fuel structure, relating equipment for production purposes, equipment for material testing such as XRD, SEM/TEM, corrosion test mechanical, test mechanical test, physical chemistry test.	Lecture, OJT, Experiment	1,5 ~ 3 months	ANTEP
63	Reactor physics experiment (Malaysia)	To develop skills and understand methods through hands-on reactor physics experiments	Experiment, Lecture	3 months	ANTEP
64	Shielding Material (Malaysia)	Development of new shielding material and efficiency calculation	OJT	5 months	ANTEP
		To develop skills and understand in shielding material including: - Shielding calculation for different types & multilayer Shielding Material - Shielding calculation for Finite & Infinite Shielding Material - Parameters & data of Shielding Materials	OJT, Lectures	3 months	ANTEP
65	Shielding Design (Malaysia)	To acquire knowledge on shielding design with emphasis on: - Collide & in-collide radiation calculation (after shielding) - Reactor shielding design (e.g.: shadow shielding design) - Calculation & Design using Computer Codes - Shielding design for various source terms and geometries - Use of MCNP and MICROSIELD for shielding materials calculation	OJT, Lectures	3 months	ANTEP
		To train and teach local staff on the appropriate methods of shielding design	Dispatch of expert	2 weeks	ANTEP

66	Fuel management and optimization (Malaysia)	To develop knowledge and skills on fuel management and optimization of research reactor	OJT, Lectures	3 months	ANTEP
67	Reactor core redesign (Malaysia)	To develop skills and understand methods on the universal reactor core design using various codes	OJT, Lectures	3 months	ANTEP
68	Reactor upgrading feasibility (Malaysia)	To train and teach local staff on the reactor upgrading feasibility study	Dispatch of expert	3 weeks	ANTEP
69	Nuclear Data processing (Malaysia)	To acquire knowledge and familiarize with nuclear data processing	Dispatch of expert	2 weeks	ANTEP
70	Irradiation facilities design and calculation (Malaysia)	To train and teach local staff on the irradiation facilities design and calculation	OJT, Lectures	3 months	ANTEP
71	Development of Radiation Detector and signal processing (Malaysia)	Development of new radiation detectors, behavior and application for radiation detection especially for neutron detection and the connected hardware for signal processing.	Research Experiments and lectures	12 months	ANTEP
72	Reactor Systems Integrity Inspection (Non Destructive Testing method, etc) (Malaysia)	Research Reactor Structures Systems and Components Inspection Methodologies	OJT and Lectures	3 months	ANTEP
73	Reactor Maintenances and Services Planning Management (Malaysia)	Planning management, operation and maintenance, and surveillance programme of a research reactor focusing on Condition Based Monitoring (CBM) and ageing management	OJT and lectures	3 months	ANTEP
		Operation and maintenance on a digital and computerize instrumentation and control system of a research reactor focusing on Condition Based Monitoring (CBM) and ageing management	OJT and lectures	6 months	ANTEP
		Study on nuclear materials aging and degradation effect (e.g. corrosion protection and corrosion control) Understanding the process chemistry involved in the primary and secondary loop	OJT	4 months	ANTEP

74	Upgrading of Instrumentation and control system using digital and computerized technique for research reactor. (Malaysia)	Refurbishment of an analog instrumentation and control system to modern system using digital technique and computer control for a research reactor	Research, experiments and lectures	9 months	ANTEP
75	Fuel materials for Research Reactor (Malaysia)	Understanding on materials selection for fuel in research reactor	OJT, Lectures	3 months	ANTEP
76	Fuel Engineering and Fabrication for Research Reactor (Malaysia)	Familiar, develop knowledge, and skills on fuel fabrication technology and engineering for research reactor	OJT, Lectures	3 months	ANTEP
77	Planning and Management of Research Reactor Refurbishment/Upgrading Program (Malaysia)	Project management of reactor refurbishment /upgrading	OJT, Lectures	3 months	ANTEP
78	Ageing management of research reactor (Malaysia)	Ageing management and methodology of research reactor	OJT, Lectures	3 months	ANTEP
79	In Service Inspection (Malaysia)	Familiarization of code and standard for In-Service Inspection (ISI) and the application of NDT data for the risk based management system	OJT, Lectures	6 months	ANTEP
80	Neutron Beam for Reactor Materials (Malaysia)	Experimental works on the application of neutron scattering principles on materials study Experimental work on the application of neutron radiography on material study (including fuel inspection)	OJT, Lectures	3 months	ANTEP
		Study on Neutron induced prompt gamma ray techniques for materials characterization and analysis	OJT	4 months	ANTEP
81	Development of Radiation Detector (Malaysia)	Development of small and compact radiation detectors (NaI, BGO, etc) using photodiode/avalanche coupling for industrial radioisotope applications	OJT	4 months	ANTEP

82	Reactor Systems Integrity Inspection (Non Destructive Testing method, etc) (Malaysia)	1)Development of NDT instrumentation, procedure and methodology for inspection of nuclear components such as heat exchanger, pressure vessel and piping systems 2)Development of high resolution x-ray computed tomography system for nuclear fuel inspection and analysis	1) OJT during plant shut down 2)OJT	1) 6months 2) 4months	ANTEP
83	Radiation Safety Aspects on Decommissioning of Research Reactor (Philippines)	To acquire knowledge and experience on the safety assessment and analysis review before and after decommissioning/removal of radioactive materials in reference to radiation protection criteria for safety release	Lecture, Research and OJT	1-3 months	ANTEP
84	Accident Analysis (Philippines)	To acquire knowledge and experience in performing accident/abnormal condition of research reactor and provide data needed in performing radiological impact assessment	Research and OJT	3 months	ANTEP
85	Thai Research Reactor Training Program (Thailand)	To refresh the knowledge and technique in TRR operation.	Lecture	2 weeks	Domestic
86	Nuclear Reactor engineering and control (Thailand)	To refresh the knowledge and technique in nuclear reactor engineering and control.	Lecture	3 weeks	Domestic
87	Experimental on Research Reactor (Thailand)	To enhance the utilization in research reactor.	Training	1 week	Domestic
88	Expert mission on nuclear instrument/ nuclear reactor application (Thailand)	To enhance the nuclear reactor application.	Expert	1 month	ANTEP
89	Neutron radiography (Vietnam)	To acquire knowledge and experience on neutron radiography using research reactor in order to determine defects in materials	Lecture, Research, OJT	6 months	ANTEP

D. Nuclear Power Reactor					
90	Evaluation of Nuclear Power Plant Site (Bangladesh)	To gather knowledge on site characterization, geo-hydrological data analysis, metrological data analysis, water modeling, etc.	OJT, Lecture, Research	3-6 Months	ANTEP
91	Site Licensing of Nuclear Power Plant (Bangladesh)	To asses site permit, site safety report, etc.	OJT, Lecture, Research	3-6 Months	ANTEP
92	HRD on Introduction of Nuclear Power Plant (Bangladesh)	To skill on the evaluation of geo-physical parameters, calculate the reactor core-parameters, etc.	OJT, Lecture, Research	3-6 Months	ANTEP
93	Water Chemistry and water management of Nuclear Power Plant (Bangladesh)	To provide knowledge on scaling, Corrosion, water quality maintenance, elemental analysis, etc.	OJT, Lecture, Research	3-6 Months	ANTEP
94	Development in Material for Nuclear Fuel Structure based on Zirconium Alloy (Indonesia)	The program covers some lectures on theoretical and technical aspect of how to produce material for structure material base on zircon alloy for high burn up reactor. The facilities are melting furnace, equipment for material testing such as XRD, SEM/TEM, corrosion test, mechanical test, physical chemistry test.	expert services	3 months	ANTEP
95	Development in Material for Nuclear Fuel Structure based on Ceramic Composite Material (Indonesia)	The program covers some lectures on theoretical and technical aspect of how to produce material for structure material base on ceramic composite for high burn up reactor. The facilities are the equipment for processing ceramic composite, furnace, equipment for material testing such as XRD, SEM/TEM, corrosion test, mechanical test, physical chemistry test.	expert services	3 months	ANTEP

96	Development in Nuclear Fuel Material for PWR (Indonesia)	Research and development in nuclear fuel element and structure material for PWR type. Facilities to be used are laboratory equipments for research in nuclear fuel and structure material such as mixer for UO ₂ powder mixed with binder or other sintering aid or others materials, compacting equipment for producing green uranium oxide pellets, sintering equipment for sintered uranium oxide pellets and grinding equipment for sintered uranium oxide pellets fix the shape, furnace, characterization equipments (physicochemistry testing, mechanical testing, microstructure testing, etc)	Lecture, OJT	1,5 months	ANTEP
97	Plant Design for Nuclear Fuel Fabrication (Indonesia)	Supply and demand data of nuclear fuel elements, engineering data for plant design, software for economic evaluation	Lecture, OJT, Experiment	2 months	ANTEP
98	Thermal-hydraulic calculation and cooling system design for high power reactor (Malaysia)	To develop knowledge and skills in assessing fuel performance in relating to thermal hydraulic under normal as well as transient conditions	OJT, Lectures	3 months	ANTEP
99	Modern Instrumentation and control system engineering of a Nuclear Power Plant (Malaysia)	Design and engineering of a modern instrumentation and control system for a Nuclear Power Plant	OJT, Lectures and Experiments	12 months	ANTEP
100	Operation and Maintenance on instrumentation and control system of a latest PWR nuclear power plant (Malaysia)	Knowledge and experience on the operation and maintenance technique on the instrumentation and control system of a latest PWR nuclear power plant.	OJT, Lectures	12 months	ANTEP
101	Emergency and reactor protection system of PWR / BWR nuclear power plant (Malaysia)	Design, operation and maintenance experience and knowledge on the most important section/modules and system in a nuclear power plant especially for PWR and BWR type of reactor.	OJT, Lectures and Experiments	9 months	ANTEP

102	Mechanical, electrical and instrumentation planning and management in Nuclear Power Plant Project (Malaysia)	Knowledge, exposure and experience in the area of mechanical, electrical and instrumentation engineering related to the implementation of a nuclear power plant project	OJT, Lectures	9 months	ANTEP
103	Civil and Architecture planning and management in Nuclear Power Plant Project (Malaysia)	Knowledge, exposure and experience in the area of civil and architecture related to the implementation of a nuclear power plant project.	OJT, Lectures	9 months	ANTEP
104	Seismology & Seismic Engineering (Malaysia)	Understanding seismic criteria, and all aspects of engineering design including vibration analysis of plant structures	OJT, Lectures	3 months	ANTEP
105	Meteorology & atmospheric dispersions (Malaysia)	Understanding meteorological criteria and perform atmospheric dispersion calculations	OJT, Lectures	3 months	ANTEP
106	Fuel management at power plant (Malaysia)	Understanding safety criteria in fuel management and perform engineering safety calculations using appropriate codes	OJT, Lectures	3 months	ANTEP
		Familiar with the behavior of fuel during all postulated accidents or abnormal operating conditions and the codes which have been developed to predict the consequences of any such event, and to prepare the documents to license any power reactor, familiar with the fabrication of nuclear fuel, starting with experimental elements and concentrating on production fuel	OJT, Lectures	3 months	ANTEP
107	Fuel materials for Nuclear Power (Malaysia)	Understanding on materials selection for fuel in nuclear power plant	OJT, Lectures	3 months	ANTEP
108	Fuel Engineering and Fabrication for Nuclear Power Plant (Malaysia)	Familiar, develop knowledge, and skills on fuel fabrication technology and engineering for nuclear power	OJT, Lectures	3 months	ANTEP
109	Surveillance Programme for Nuclear Power Plant (Malaysia)	Development and implementation of surveillance programme for NPP to ascertain the integrity of material in the reactor core	OJT	3 months	ANTEP

110	Safety Analysis (Malaysia)	Development of advanced radioisotope techniques for reactor safety and performance related analysis of Generation IV reactors.	OJT	3 months	ANTEP
111	Environmental and Radiological Assessment of NPR and Its Environs (Philippines)	To gain knowledge and expertise on the review of safety analysis reports of NPR operator	Lecture, Research and OJT	1-3 months	ANTEP
112	Nuclear Siting (Philippines)	To acquire practical knowledge on siting requirements of nuclear power plants	OJT	3 months	ANTEP
113	Nuclear Power Operation (Philippines)	To acquire updates on nuclear power operation and engineering for use in training future NPP personnel	OJT	3 months	ANTEP
114	NPP Construction and Inspection (Philippines)	To have actual experience on NPP construction and inspection of this facility	OJT	3 months	ANTEP
115	Experts on General Planning for national Nuclear Power Program and the National Nuclear Administrative Structure (Thailand)	To develop the planning technique for NPP.	Expert	1 month	ANTEP
116	Experts on the Structure, Content and Legislative Process for Establishing the Legal System for National Nuclear Power Program (Thailand)	To develop the legal system for NPP.	Expert	1 month	ANTEP
117	Experts on the Responsibilities, Competencies, Structure and Authorization of the Full NRB for the NPP Program (Thailand)	To develop the full NRB for NPP.	Expert	1 month	ANTEP
118	Experts on Nuclear Technology Localization Policy, Industrial Infrastructure and Technology Development Program (Thailand)	To develop the policy, infrastructure and technology	Expert	1 month	ANTEP

119	Hearing on NPP Emergency Planning preparedness (Thailand)	To acquire knowledge between the technocrat and the public in NPP emergency plan.	Lecture	1 day	Domestic
120	Determining the Quality of Probabilistic Safety Assessment (PSA) for Applications in Nuclear Power Plants (Vietnam)	To acquire knowledge and experience on using tools for assessment of safety of Nuclear Power Plants.	OJT	6 months	ANTEP
121	Use of Computational Fluid Dynamics Codes for Safety Analysis of Nuclear Reactor Systems (Vietnam)	To acquire knowledge and experience on using tools for safety analysis of Nuclear Power Reactors.	OJT	6 months	ANTEP
122	Accident Analysis for Nuclear Power Plants with Pressurized Water Reactors (Vietnam)	To acquire knowledge and experience on Accident Analysis for Nuclear power Plants with Pressurized Water Reactors.	OJT	6 months	ANTEP
123	Nuclear material technology (Vietnam)	To acquire knowledge and experience on studying nuclear material technology for the future	OJT	6 months	ANTEP
E Nuclear Administration					
124	Nuclear Safety (Malaysia)	To equip personnel with sufficient knowledge and skills on nuclear safety	OJT, Lectures	3 months	ANTEP
125	Legal aspects (Malaysia)	Understanding relevant national and international regulations, conventions	OJT, Lectures	3 months	ANTEP
126	Tech Transfer Managements (Malaysia)	Training in the management of technology transfer in relation to nuclear power local content and sustainability	OJT, Lectures	3 months	ANTEP
127	Public Information and Acceptance (Malaysia)	Participation in Nuclear Administration Seminar organized by Japan to gain exposure in the following subjects: - Content management and development for media - Communicator toolbox: Key Nuclear Messages - Fundamentals of nuclear communication - Risk Communication - Scientific visit to Japan nuclear exhibition centers - Basic nuclear power course and site visit	Seminar	2 weeks	ANTEP

128	Nuclear Power Planning (Philippines)	To obtain knowledge and techniques needed for nuclear power planning	Lecture	1-2 weeks	ANTEP
129	Licensing Process of Nuclear Reactors (Philippines)	To acquire practical knowledge and skills on the different stages of licensing nuclear reactors	Lecture and OJT	3 months	ANTEP
130	Public Acceptance and Public Relations in Nuclear Facilities (Thailand)	To enhance the P.R. and P.A. capacity. Focus on Nuclear Technology Communication, Proactive communication for target group, some experiences in Nuclear Technology communication.	Lecture/Training	1 month	ANTEP
131	Strategic Planning and Implementation for Nuclear Organization (Thailand)	To develop/share the strategic planning technique for nuclear organizations which have the different limitation and status from other organizations	Lecture/Training	1 month	ANTEP
F. Others (Nonproliferation, Safeguards, etc)					
132	Safeguards and Physical Protection (Malaysia)	Understand and familiarize with Safeguards and Physical Protection aspects of a 1st NPP in order to perform informed assessment of bid documents especially on above aspects	OJT, Lectures	3 months	ANTEP
133	Security (Malaysia)	Understand and familiarize with Security aspects of a 1st NPP in order to perform informed assessment of bid documents	OJT, Lectures	3 months	ANTEP
134	Public Information, Education and Communication on Nuclear Energy (Philippines)	To gain state-of-the-art strategies and techniques in public information and communication on nuclear energy	Lecture, OJT, Dispatch of Expert and Facility Visit	2-3 months	ANTEP
135	Radon Monitoring (Philippines)	To acquire new updates on radon monitoring and evaluation of amassed data	OJT	3 months	ANTEP
136	Experts on National Nuclear Power Policy on Nuclear Safeguards and International Protocols for the NPP Program (Thailand)	To develop the nuclear power policy on nuclear safeguards and international protocol for NPP	Expert	1 month	ANTEP