

Malaysia Studies South Korea's Advance Nuclear Power Programme

South Korea's nuclear programme, known for its self reliance, strict regulation and commitment to public safety, is seen as a model to follow for Malaysia. A recent study visit to South Korea helped Malaysia to prepare for the possible adoption of nuclear energy for power generation.

Science, Technology and Innovation Minister, Y.B. Datuk Dr. Maximus Ongkili and his delegation paid a five-day visit to South Korea from 28 June until 2 July, 2009 to study the country's advance nuclear power programme.

Amongst the sites visited were the Energy Farm and Kori Nuclear Power Plants operated by Korean Hydro & Nuclear Power Co. Ltd (KHNP) in Gori, Busan, and the Korea Atomic Energy Research Institute (KAERI) in Daejeon.

While at KAERI, the MOSTI delegation watched a demonstration of the System Integrated Modular Advanced Reactor (SMART) technology, which serves the dual purpose of seawater desalination and electricity generation.

South Korea's nuclear programme, known for its self reliance, strict regulation and commitment to public safety, is seen as a model to follow for Malaysia. The Koreans lack natural resources such as gas and oil, so they turned to nuclear power as a source of energy and developed their expertise over the years out of necessity. Regular public education on nuclear issues is paramount in Korea, as the programme requires the community's support.

Korea initially relied on foreign contractors to operate its programme when the country's first nuclear plant was launched in 1978, but has since built its own reactors.

At first, South Korea's Science and Technology Ministry was the sole entity in charge of regulations, promotions and safety. Following revisions in 1986, these functions were separated: the Ministry of Trade, Industry and Energy handles the construction and operation of nuclear plants while the Ministry of Education,

Science, Technology and Innovation Minister Datuk Dr Maximus Ongkili (left) shaking hands with Na Sang -Nam, general-manager of Korea Electric Power Corporation, which operates the nuclear power plants in South Korea.



MOSTI delegation during the site visit to the KORI Nuclear Power Plant in Busan, Korea.

Science and Technology deals with licensing and regulating activities of the Government for the protection of public health and safety and the environment. This separation of the regulatory structure and operational structure in South Korea's nuclear programme promotes greater transparency and increase public confidence.

Today the country relies on its own nuclear technologies and has started sharing these technologies and skills with other countries. Thirty-six per cent of Korea's power requirements are supplied by nuclear power and the country has 20 nuclear plants running. Monitoring is done every 15 seconds and the plants are touted to have zero-risk. Eight nuclear plants are under construction with a further 10 planned in the future. Construction of nuclear reactors is well optimised: The state-run Korea Electric Power Corp can complete a reactor in just 48 months.

When it comes to operation performance, South Korea's capacity factor of 93.3% far surpasses the world average of 79.4%, making the country a world leader in the nuclear industry.

Following Y.B. Datuk Dr. Maximus Ongkili's visit, the Atomic Energy Licensing Board (AELB) and Korean Institute of Nuclear Safety (KINS) are working towards signing a memorandum of understanding on matters of nuclear safety. This year, the South Korean Government agreed to sponsor AELB officers to undergo the KINS-Korea Advanced Institute of Science and Technology's International Nuclear Safety Masters degree programme. These developments help Malaysia prepare for the possible adoption of nuclear energy for power generation and fulfill the 19 requirements which new members in nuclear technology must adhere to under guidelines set by the International Atomic Energy Agency.



Visit to AELB by Deputy Secretary General (Science)

The Deputy Secretary General (Science) of MOSTI, Y.Bhg. Datin Paduka Prof. Dr. Khatijah bt. Mohd. Yusoff visited AELB on March 19, 2009 as part of a series of working visits to check on the status and progress of departments under MOSTI.

During the visit, Datin Paduka Prof. Dr. Khatijah viewed the radiation monitoring and protective equipment on display at AELB's *Pasukan Bertindak Kecemasan* (PBK) building.

AELB's Director of Nuclear Installation Division, Pn. Azlina Muhammad Jais gave a presentation on the roles, responsibilities and functions of AELB, its on-going activities, achievements and future plans.



◀ Y. Bhg. Datin Paduka Prof. Dr. Khatijah (second from left) given a briefing on how to use the Identifinder – a radiation identification device.

Y. Bhg. Datin Paduka Prof. Dr. Khatijah (second from right) together with (from left in front row) MOSTI Legal Advisor, Tn. Hasbullah Adam, AELB Chairman, Prof. Dato' Dr. Noramly Muslim and AELB Director General, YM. Raja Dato' Abdul Aziz Raja Adnan and (in back rows) AELB Division Directors and Officers. ▼



Global Threat Reduction Initiative (GTRI)

AELB received a delegation from the International Atomic Energy Agency (IAEA) and the United States Department of Energy (USDOE) on March 23, 2009. The visit conducted under the Global Threat Reduction Initiative (GTRI) was made to achieve the security requirements for Category 1: Radioactive Materials Facilities for the facility. USDOE agreed to provide funds for work on upgrading the facility's security measures. After two days of evaluation, the delegation from IAEA and USDOE selected Safeguard Securicor Sdn Bhd as the local contractor to perform the upgrade work.

Sterillgamma Sdn Bhd and Universiti Malaya Medical Centre (UMMC) were selected by AELB and USDOE to receive funds under this security initiative.

Workshop on Readiness for Implementation of Additional Protocol for Nuclear Non-Proliferation Treaty



Participants from various agencies and ministries of the Malaysian Government during the workshop.

AELB organised the Workshop on Readiness for Implementation of Additional Protocol for Nuclear Non-Proliferation Treaty (NPT) from March 30 to April 1, 2009 to give early exposure to staff members of AELB and Government agencies on the implementation of NPT's Additional Protocol (AP) in Malaysia.

The workshop was held through collaboration between AELB, International Atomic Energy Agency (IAEA), Australian Safeguards and Non-Proliferation Office (ASNO) and the U.S. Department of Energy (DOE).

A total of 45 participants from ministries and agencies of the Malaysian Government attended the workshop, including those from the Prime Minister's Department, Attorney General's Chambers, Ministry of Health, Royal Malaysian Police, National Security Council, Ministry of International Trade and Industry, Ministry of Science, Technology and Innovation, Malaysian Nuclear Agency and the Ministry of Defence.





Various experts from AELB, IAEA, Australian Safeguards and Non-Proliferation Office (ASNO) and Department of Energy (DOE) USA.

Seminar on Readiness of Malaysian Implementation of Additional Protocol

Held at Putrajaya International Convention Centre on April 2, 2009, the Seminar on Readiness of Malaysian Implementation of Additional Protocol (AP) was aimed to introduce participants from Malaysia's construction industry to AP, its objectives for control as well as control of technology and equipment based on APs.

The seminar was launched by AELB Chairman, Y.Bhg Prof. Dato' Dr. Noramly Muslim. A total of 65 representatives from relevant industries attended the seminar, which hosted speakers consisting of experts from International Atomic Energy Agency (IAEA), Australian Safeguards and Non-Proliferation Office (ASNO) and AELB.

IAEA Regional Co-ordination Meeting for Strengthening National and Regional Capabilities for Response to Radiological & Nuclear Emergencies



IAEA experts and participants at the Regional Coordination Meeting for Strengthening National and Regional Capabilities for Response to Radiological & Nuclear Emergencies, Kuala Lumpur.

From April 13 to 17, 2009, AELB hosted a Regional Co-ordination Meeting organised by IAEA under Technical Co-operation Regional Project RAS/9/057 on Strengthening National and Regional Capabilities for Response to Radiological & Nuclear Emergencies. The meeting held in Kuala Lumpur was attended by three experts from IAEA, 18 participants from Asian and the Pacific regions and five participants from Malaysia.



Participants during the meeting.

The meeting was held to review the status and achievements made by participating countries in their organisational and the technical capabilities for planning and responding to radiological and nuclear emergencies. It was also intended to expedite the process of strengthening national capabilities for nuclear and radiological emergency preparedness and response so as to be consistent with international requirements (IAEA GS-R-2), and to help in bridging the still existing gaps and shortcomings in relevant national programmes.



Participants of the Workshop on Readiness for Implementation of Additional Protocol for Nuclear Non-proliferation Treaty (NPT) together with the experts from IAEA, AELB, ASNO and U.S. DOE.

Safety Analysis and Regulatory Requirements for Research Reactor Modification Workshop

The five-day workshop held from April 20 to 24, 2009 was aimed at assisting AELB in developing a mechanism to regulate and supervise research reactor modification activities. A total of 30 officers from AELB, Malaysian Nuclear Agency and Tenaga Nasional Berhad participated in the workshop conducted by Mr. Amgad Shokr and Mr. Chan-Oh Park, both from the International Atomic Energy Agency (IAEA); and Ms. Alicia Doval from Argentina. The three are experts in operations and modification on research reactors.

The workshop focused on technical aspects needed for the Malaysian authorities to handle operations and for operational agencies to implement modification activities. Following the workshop, AELB developed a draft entitled "Standard for Modification of Research Reactors" that outlined the technical requirements from the aspects of safety, physical protection and control of nuclear materials that must be fulfilled in order to implement research reactor modification activities.



Participants of the workshop with the Experts from Argentina; Ms. Alicia Doval (first row, from left) and from IAEA; Mr. Amgad Shokr and Mr. Chan-Oh Park.

Physical Training Exercise for AELB's Emergency Response Team members

A physical training exercise consisting of aerobics and marching was held on May 22, 2009 for members of AELB's Emergency Response Team. A total of 50 PBK members and 15 non-technical staff participated in the training session designed to increase their fitness levels, which were led by soldiers brought in from the Sungai Besi Army camp.



Aerobics led by the soldiers at AELB Hall.



Marching drills led by soldiers from Sungai Besi Army Camp.

Strategic Planning Workshop 2009

AELB held a workshop from April 27 to 30, 2009 at the A' Famosa Resort in Melaka to assess the department's performance in 2008 and set new strategies for 2009. Some issues discussed at the workshop were Key Deliverables 2008, Final Term Performance Report on Key Deliverables 2008, Final Term Performance Report of Business Plan 2008, AELB's Details of Outcome for the Year 2008 and AELB's Strategies and Action Plan 2009.



AELB Officers discussing the performance report at the Strategic Planning Workshop.

IAEA Fellowship Programme

AELB received two trainees from IAEA during the first half of 2009. The first trainee was Alfonso Arao Singayan from the Philippines Nuclear Regulatory Institute, who undertook the fellowship programme at AELB from February 16 to May 15, 2009. The other trainee was Abdullah Fahad Aldalilah from the Institute of Atomic Energy Research Saudi Arabia who stayed from July 6 to August 12, 2009.

Both trainees, placed under AELB's technical division, underwent training in handling radioactive waste and were also introduced to licensing systems and radioactive material inspection procedures in Malaysia.

1st International Summer School on Nuclear Power Science and Engineering

The Centre of Applied Physics Studies, Faculty of Science and Technology, Universiti Kebangsaan Malaysia (UKM) in collaboration with the Korea Advanced Institute of Science and Technology (KAIST) held the first International Summer School on Nuclear Power Science and Engineering from May 25 to June 5, 2009.

This international course held at Danau Golf Resort, UKM, was themed “Gain Knowledge, Establish Foundation and Improve Skills for Future Nuclear Power Reactor”.

Participants were taught, amongst others, the latest knowledge in nuclear reactor engineering, the foundation of nuclear reactor theory related with neutron reactions, nuclear fission and chain reactions, concepts and principles of heat and mass transport phenomena and system control in nuclear power plants.

AELB sent nine officers to attend the course as part of AELB’s aim to increase the ability of its officers to understand the basics of



Students of International UKM-KAIST Summer School on Nuclear Power Science & Engineering 2009 together with Prof. Hee Cheon No (4th from left), Prof. Dr. Salmijah (Dean, Faculty of Science & Technology, UKM), Prof. Nam Zin Cho and Assoc. Prof. Dr. Muhamad Samudi (Head of Nuclear Science Program, UKM).

operating a nuclear power reactor, in preparation for the possibility of the country using nuclear power as an alternative energy source in future.

Knowledge gained from the course will help develop expertise in safety measures required to operate nuclear facilities and can also be used to help prepare inspection procedures and audit nuclear materials and facilities.

Placement of two *Badan Pengawas Tenaga Nuklir* (BAPETEN) experts at AELB

On July 19, 2008, Malaysia represented by AELB signed a memorandum of understanding (MoU) with Indonesia’s BAPETEN on the Exchange of Technical Information and Co-operation in Nuclear and Radiation Safety. One of the areas of co-operation mentioned in Article III (Area of Co-Operation) was for regulations in nuclear installations.

Following the signing of the MoU, AELB received two officers from BAPETEN as guest experts on analysing technical safety activities of nuclear reactors in Malaysia. The officers were Mr. Heryudo Kusumo, Senior Staff for Licensing and Inspection, and Mr. Yanuar Wahyu Wibowo, Head of Sub-Directorate for Licensing of Nuclear Reactors and Materials. The two BAPETEN officers who have more than 10 years experience in research reactor safety were at AELB under official placement for one month from March 9 to April 10, 2009.

Several key outputs emerged from the programme. AELB successfully developed a draft for “Guidelines for Research Reactors Modification”, a comprehensive set of guides for



Mr. Yanuar Wahyu Wibowo and Mr. Heryudo Kusumo.

regulating activities on research reactor modifications. AELB also suggested improvements to Chapters 16 and 17 of the SAR of PUSPATI TRIGA Research Reactor.

AELB staff gained valuable experience through analysing the SAR as well as gaining an understanding on regulatory work for research reactor modification activities.

The programme also served as a platform for AELB to discuss in detail other areas for co-operation listed in the MoU with BAPETEN, especially those related to human resource development in nuclear safety and control.

Seminar on Operational Safety and Security Awareness for Radiation Workers in Sales and Gauging Activities for Industrial Radiography and NORM



Radiation Protection Officers, Radiation Workers as well as License Holders with Mr. Hamrah Mohd Ali; Director of Enforcement Division AELB (first row, 8th from left) and AELB officers.

AELB held a seminar on Operational Safety and Security Awareness for radiation workers in sales and matching activities for industrial radiography and naturally occurring radioactive material (NORM) at ParkCity View Hotel, Bintulu from August 4-5, 2009. The seminar was officially opened by Deputy Minister of MOSTI, Y.B. Tuan Hj. Fadillah Yusoff. Also present at the opening ceremony were the Director General of AELB Bintulu Residence, Director of Department of Chemistry Sarawak, senior AELB officials, invited guests and seminar participants.

The seminar was held to specifically assist radiation workers and license holders in general in raising awareness on their responsibilities and their needs to adhere to the requirements of the Atomic Energy Licensing Act 1984 (Act 304).

Adhering to operational safety is very important to ensure that the safety of workers, the public and the environment is protected. Enforcing security on handling radioactive materials in Malaysian industries is also important in order to prevent misuse of those materials for illegal purposes such as sabotage and smuggling. In light of this, AELB has set procedures and conditions in line with a guide released by the International Atomic Energy Agency (IAEA) entitled the "Code of Conduct on the Safety and Security of Radioactive Sources" as well as other related documents.

Today, security aspects have received widespread attention and emphasis in not only the handling of radioactive materials, but also in other industries in Malaysia. There are 961 companies and



Y.M. Raja Dato' Abdul Aziz Raja Adnan presenting a memento to Y.B. Tuan Hj. Fadillah Yusoff; Deputy Minister of MOSTI.

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on safety and security measures to prevent radiation accidents and incidents. Indirectly, a heightened level of safety will increase the confidence of foreign investors and show that Malaysia not only has first class infrastructure and skilled workers but also enforcement bodies that are efficient.

Government agencies licensed by AELB covering a myriad of activities such as gauges, sales, industrial radiography, NORM, mineral processing, oil exploration, research, training and consultancy. The radiography industry has the highest levels of radiation exposure compared to other industries, thus safety and security measures are a priority and these were emphasised during the seminar.

Statistics show that in 2008, 18 radiography industry workers were charged with not following the rules under Act 304. Subsequently, 67% or 12 of the affected workers who were experienced radiation officers were trained accordingly. The rest were officers with less than three years of experience. It is noted that experience alone is not enough to prevent mishandling of radioactive materials and that carelessness and overconfidence caused the officers to overlook safety and security aspects.

AELB has taken stern measures against companies and radiation workers that have been found to breach any rules. These measures include revoking their licenses, seizing premises, stopping operations and taking legal action.

Apart from emphasising on enforcement of regulations, it is hoped that seminars like this can raise the awareness

President of Korean Institute of Nuclear Safety (KINS) visits AELB

Yun is confident that Malaysia is ready to embrace the nuclear age. "If we look at our co-operation with the AELB, we can see that Malaysian scientists and officials are very well prepared to go nuclear. I can say they are much better prepared than (South) Korea was when we started our programme."

The President of Korean Institute of Nuclear Safety (KINS), Mr. Yun Choul Ho accompanied by the Director of International Nuclear Safety School of Korea, Mr. Y.W. Park, visited AELB on August 13, 2009.

In their one day visit, the delegates held talks with AELB directors and senior officers and also met with the Minister of Science, Technology and Innovation, Y. Bhg. Dato' Dr. Maximus Ongkili. Discussions between AELB and KINS led to the signing of a memorandum of understanding between the two parties to carry out On-the-Job Training and Masters Degree programme.

A dinner reception for the two delegates was held at the Pan Pacific Hotel in Sepang, which was also attended by Chairman of AELB, Y. Bhg. Prof. Dato' Dr. Noramly Muslim and Chairman of Tenaga Nasional Berhad, Dr. Mohd Zamzam Jaafar.



Director General of AELB; Y.M. Raja Dato' Abdul Aziz Raja Adnan (left) presenting a memento to Mr. Yun Choul Ho; President of Korean Institute of Nuclear Safety (KINS).



From left: Y.M. Raja Dato' Abdul Aziz Raja Adnan, Prof. Dato' Dr. Noramly Muslim, Y.Bhg. Dato' Dr. Maximus Ongkili, Mr. Yun Choul Ho and Mr. Y.W. Park.



Mr. Y.W. Park, Mr. Yun Choul Ho and Y.M. Raja Dato' Abdul Aziz Raja Adnan with AELB officers.

Sub-standing Safety Committee Meeting



Members of Sub-standing Safety Committee Meeting for Medical Radiation Protection with Director General of AELB; Y.M. Raja Dato' Abdul Aziz Raja Adnan (first row, 4th from left) and AELB Officers.

The Sub-Standing Safety Committee Meeting for Medical Radiation Protection was held at Novotel 1Borneo, Sabah from August 16 to 19, 2009. The meeting was conducted in order to finalise the draft of Radiation Protection and Safety (Medical, Dental and Veterinary Usage of Radiation) Regulations 200_.

The Regulations made under Section 68 and Sub-section (6) of Section 25 of the Atomic Energy Licensing Act 1984 (Act 304) apply to all activities involving medical, dental and veterinary usage

of radiation. These activities will be guided by the As Low As Reasonably Achievable (ALARA) principle.

The members of the Sub-standing Safety Committee for Medical Radiation Protection consists of experts in ionising radiation techniques from various fields including radiotherapy, nuclear medicine, radiology, radiopharmaceutical, dental and veterinary. The regulations will be submitted to the Standing Safety Committee for further discussions on policy matters before submission to AELB Board for approval.



AELB Board members and AELB Officers during the meeting.

2nd AELB Board Meeting 2009

The 2nd AELB Board Meeting on September 3, 2009 saw several suggestions being made to develop the National Nuclear Regulatory Policy, and develop the criteria for Consultant Competency in site screening Nuclear power reactors (Class H License). The meeting was chaired by Y.Bhg Prof Dato' Dr. Noramly Muslim. Board members in the meeting included Datuk Dr. Daud Hj. Mohamad, Dato' Ir. Pian Sukro, Y.Bhg. Datin Paduka Prof. Dr.

Khatijah Mohd Yusoff, Datuk Dr. Noor Hisham Abdullah and executive Secretary YM Raja Dato' Abdul Aziz Raja Adnan. Also in attendance were MOSTI legal advisors, officers from the Ministry of Health, AELB Division Directors and Senior Officers.

Also discussed during the meeting were the appointment of members for the Committee on Radioactive Safety (Medical Radioactive protection) and plans to reorganise the membership of the National Committee on Certification of Radioactive Protection Officers (JKPPPS). The status quo of the Atomic Energy Licensing Act 1984 (Act 304) on the drafting of the Medical Devices Act 200_ was also looked into, among other matters in the meeting agenda.

53rd IAEA General Conference: Malaysia participates in ANSN roundtable discussion



The 53rd IAEA General Conference was held in Vienna, Austria on September 15, 2009. There were several important outcomes from the Asian Nuclear Safety Network (ANSN) roundtable discussion held in conjunction with the conference.



The ANSN agreed to co-operate with other regional networks such as the European Network, the Latin America Network- FORO and the Forum of Nuclear Regulatory Bodies in Africa –FNRBA. The IAEA Global Nuclear Safety and Security Network (GNSSN) will be acting as the co-ordinator for the planned co-operation.

In another agreement, Japan, Korea (KINS) and China were chosen as education and training providers for capacity building in nuclear safety and security for the Asian region.

Regional Workshop on Combating Illicit Trafficking in Nuclear and Other Radioactive Materials

The "Regional Workshop on Combating Illicit Trafficking in Nuclear and Other Radioactive Materials" was held from October 12 to 15, 2009 at the Swiss Garden Hotel in Kuala Lumpur. Experts speaking at the workshop were Mr. Pantelis Ikonomou from the IAEA's Department of Nuclear Safety and Security and Mr. Mohd Yasin Hj. Sudin, AELB's Director of Licensing Division.

Participants at the workshop came from Malaysia, Indonesia, Singapore, Brunei, Vietnam, Myanmar, Bangladesh, Thailand and the Philippines.

The objectives of the workshop were to help participants:

- understand the characteristics of radioactive materials;
- be aware of the relevant international instruments for nuclear security;
- be familiar with the Illicit Trafficking Database (ITDB) and global as well as regional patterns;
- be aware of detection and monitoring technology and related equipment (hands-on experience with instruments and practical applications); and
- be familiar with the required response procedures to combat illicit trafficking in radioactive materials.



Regional workshop participants at the closing ceremony with Mr. Pantelis Ikonomou (first row, 5th from left) and Mr. Mohd. Yasin Hj. Sudin (first row, 6th from left).

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