2014

Laporan Tahunan

Annual Report

Kementerian Sains, Teknologi
dan Inovasi Malaysia
Ministry of Science,
Technology and Innovation Malaysia

Visi Kami

Sentiasa relevan sebagai sebuah badan perundangan yang berwibawa dalam keselamatan sinaran dan nuklear, sekuriti dan kawalgunaan untuk kegunaan secara aman bagi pembangunan mampan.

Misi Kami

Menggalakkan budaya inovasi bagi memastikan Penggunaan Teknologi Nuklear dan Sinaran dengan Aman dan Selamat.

Our Vision

Remaining a relevant regulatory authority with credibility in radiation and nuclear safety, security and safeguarding its peaceful uses for national sustainable development.

Our Mission

Encouraging innovation culture to ensure the safe and peaceful uses of radiation and nuclear technology.

Lokasi Kami

Lokasi-lokasi cawangan AELB yang berada di seluruh negara membantu peranan kami dalam memastikan SEKURITI dan KESELAMATAN nuklear negara. Ibu Pejabat AELB terletak di Dengkil, Selangor dan disokong lima cawangan serta tujuh stesen pemantauan yang diletakkan di lokasi strategik di seluruh Malaysia. Keradioaktifan di dalam persekitaran dipantau dengan menggunakan Sistem Pemantauan Radiologi Persekitaran (ERMS). Untuk tujuan sekuriti nuklear negara, Portal Pemantauan Sinaran (RPM) dipasang dan diletakkan di pintu-pintu masuk negara untuk tujuan mengesan sinaran

Ibu Pejabat

LEMBAGA PERLESENAN TENAGA ATOM (AELB)
Kementerian Sains, Teknologi dan Inovasi
Batu 24, Jalan Dengkil, 43800 Dengkil, Selangor MALAYSIA
Tel: 603-8922 5888
Faks: 603-8922 3685
Laman web: www.aelb.gov.my

Pejabat Cawangan dan Stesen Pemantauan

1. CAWANGAN ZON UTARA (PULAU PINANG)
   Lembaga Perlesenan Tenaga Atom
   Kementerian Sains, Teknologi dan Inovasi
   No. 29, Lorong Perda Selatan 1
   Bandar Perda, 14000 Bukit Mertajam
   Pulau Pinang
   Tel: 04-539 8391/539 0486
   Faks: 04-537 6380

2. CAWANGAN SELATAN (JOHOR)
   Lembaga Perlesenan Tenaga Atom
   Kementerian Sains, Teknologi dan Inovasi
   Cawangan Zon Selatan (Johor)
   No. 26, Jalan Sri Putra 1
   Bandar Putra, 81000 Kulai
   Johor
   Tel: 07-663 2431/663 430
   Faks: 07-663 2409 0

3. CAWANGAN TIMUR (TERENGGANU)
   Lembaga Perlesenan Tenaga Atom
   Kementerian Sains, Teknologi dan Inovasi
   Cawangan Zon Pantai Timur (Terengganu)
   Pt 6980, Bukit Kuang Business Centre
   24000 Kemaman, Terengganu
   Tel: 09-850 3362/60
   Faks: 09-850 3361

4. CAWANGAN SABAH & SARAWAK
   Lembaga Perlesenan Tenaga Atom
   Kementerian Sains, Teknologi dan Inovasi
   Cawangan Zon Malaysia Timur
   Sub Lot 13, Lots 2370 & 2371
   Block 32, Kawasan Perindustrian Sibiyu
   97000 Bintulu, Sarawak
   Tel: 086-330 469/315 469/339 469
   (Talian Terus ke Ketua Cawangan)
   Faks: 086-332 469

5. CAWANGAN GEBENG, KUANTAN PAHANG
   Lembaga Perlesenan Tenaga Atom
   Kementerian Sains, Teknologi dan Inovasi
   Pejabat Cawangan Gebeng
   B10, Jalan Balok Perdana 3/5
   26080 Kuantan, Pahang
   Tel: Tiada
   Faks: Tiada

Our Locations

AELB's nationwide locations facilitate our role in ensuring NUCLEAR SECURITY and SAFETY for the country. The operations of our Headquarters in Dengkil, Selangor are supported by four Branches and seven monitoring stations situated in strategic locations all over Malaysia. Radioactivity in the environment is being monitored by the Environmental Radiological Monitoring System (ERMS). For purpose of nuclear security, Radiation Portal Monitors (RPM) are installed at stations located at entry points to the country to detect radiation.

Headquarters

ATOMIC ENERGY LICENSING BOARD (AELB)
Ministry of Science, Technology and Innovation
Batu 24, Jalan Dengkil, 43800 Dengkil, Selangor
MALAYSIA

Branch Offices and Monitoring Stations

1. NORTHERN BRANCH (PENANG)
   Atomic Energy Licensing Board
   Ministry of Science, Technology and Innovation
   Northern Zone Branch
   No. 29, Lorong Perda Selatan 1
   Bandar Perda, 14000 Bukit Mertajam
   Pulau Piang
   Tel: 04-539 8391/539 0486
   Fax: 04-537 6380

2. SOUTHERN BRANCH (JOHOR)
   Atomic Energy Licensing Board
   Ministry of Science, Technology and Innovation
   Southern Zone Branch
   No. 26, Jalan Sri Putra 1,
   Bandar Putra, 81000 Kulai
   Johor
   Tel: 07-663 2431/663 4300
   Fax: 07-663 240

3. EAST COAST BRANCH (TERENGGANU)
   Atomic Energy Licensing Board
   Ministry of Science, Technology and Innovation
   Eastern Zone Branch
   Pt 6980, Bukit Kuang Business Centre,
   24000 Kemaman, Terengganu
   Tel: 09-850 3362/60
   Fax: 09-850 3361

4. SABAH &SARAWAK BRANCH
   Atomic Energy Licensing Board
   Ministry of Science, Technology and Innovation
   Sabah &Sarawak Branch
   Sub Lot 13, Lots 2370 &2371
   Block 32, Kawasan Perindustrian Sibiyu,
   97000 Bintulu, Sarawak
   Tel: 086-330 469/315 469/339469
   (Direct Line to Branch Chief)
   Fax: 086- 332 469

5. GEBENG BRANCH, KUANTAN PAHANG
   Atomic Energy Licensing Board
   Ministry of Science, Technology and Innovation
   Gebeng Branch's Office
   B10, Jalan Balok Perdana 3/5
   26080 Kuantan, Pahang
   Tel: None
   Fax: None

Kandungan | *Contents*

Peneraju AELB Ahli Lembaga Pengarah AELB

Pengerusi Lembaga
Y. Bhg. Prof. Datuk Dr. Sukiman Sarmani
Pensyarah
Fakulti Sains dan Teknologi
Universiti Kebangsaan Malaysia

Y. Brs. Dr. Zulkifli Mohamed Hashim
Timbalan Ketua Setiausaha - Sains
Kementerian Sains, Teknologi dan Inovasi

Y. Bhg. Prof. Madya Dr. Nahrul Khair Alang Md. Rashid
Pensyarah
Jabatan Kejuruteraan Mekatronik
Universiti Islam Antarabangsa Malaysia

Y. Bhg. Datuk Ir. Ahmad Fauzi B. Hassan
Ketua Pegawai Eksekutif
Suruhanjaya Tenaga

Y. Bhg. Datuk Dr. Noor Hisham B. Abdullah
Ketua Pengarah Kesihatan (Perubatan)
Kementerian Kesihatan Malaysia

Setiausaha Eksekutif
Hamrah Bin Mohd. Ali
Ketua Pengarah
Lembaga Perlesenan Tenaga Atom
Kementerian Sains, Teknologi dan Inovasi

Members of AELB Board Members

Chairman of the Board
Y. Bhg. Prof. Datuk Dr. Sukiman Sarmani
Lecturer
Faculty of Science and Technology
Universiti Kebangsaan Malaysia

Y. Brs. Dr. Zulkifli Mohamed Hashim
Deputy Secretary General-Science
Ministry of Science, Technology and Innovation

Y. Bhg. Prof. Madya Dr. Nahrul Khair Alang Md. Rashid
Lecturer
Department of Mechatronics Engineering
International Islamic University of Malaysia

Y. Bhg. Datuk Ir. Ahmad Fauzi B. Hassan
Chief Executive Officer
Energy Commision

Y. Bhg. Datuk Dr. Noor Hisham B. Abdullah
Director General of Health (Medical)
Ministry of Health Malaysia

Executive Secretary
Hamrah Bin Mohd. Ali
Director General
Atomic Energy Licensing Board
Ministry of Science, Technology and Innovation

Pengurusan Tertinggi AELB

Pejabat Ketua Pengarah
Ketua Pengarah – Hamrah B. Mohd. Ali

Bahagian Khidmat Pengurusan
Pengarah – Danny Al Jeffery B. Abdullah

Bahagian Dasar, Kod dan Standard
Pengarah - Monalija Bt. Kastor

Bahagian Penguatkuasaan
Pengarah - Noraishah Binti Pungut

Bahagian Perlesenan
Pengarah - Hasmadi Bin Hassan

Bahagian Khidmat Sokongan
Pengarah - Mohd. Yasin B. Hj. Sudin

Bahagian Instalasi Nuklear
Pengarah - Mohd. Pauzi B. Mohd. Sobari

Top Management of AELB

Office of the Director General
Director General – Hamrah B. Mohd. Ali

Administration Services Division
Director – Danny Al Jeffery B. Abdullah

Policy, Code and Standard Division
Director - Monalija Bt. Kastor

Enforcement Division
Director - Noraishah Binti Pungut

Licensing Division
Director - Hasmadi Bin Hassan

Technical Support Division
Director - Mohd. Yasin B. Hj. Sudin

Nuclear Installation Division
Director - Mohd. Pauzi B. Mohd. Sobari

Jutaan Terima Kasih

Pihak Lembaga dan pengurusan tertinggi AELB ingin mengambil kesempatan ini bagi mengucapkan ribuan terima kasih kepada Kerajaan Malaysia, Kementerian Sains, Teknologi dan Inovasi (MOSTI), lain-lain Kementerian, jabatan dan agensi Kerajaan, serta rakan-rakan sejawat di peringkat antarabangsa di atas sokongan dan kerjasama yang diberikan. Kami juga ingin merakamkan penghargaan kepada semua kakitangan AELB di atas komitmen dan dedikasi mereka dalam melaksanakan tugas dan tanggungjawab yang diberi serta membantu AELB mencapai matlamat yang membolehkan jabatan ini terus memikul tanggungjawab dan kekal sebagai satu badan penguatkuasa yang relevan, berkesan dan berwibawa.

Pentadbiran AELB

AELB adalah sebuah jabatan di bawah naungan Kementerian Sains, Teknologi dan Inovasi (MOSTI). Lembaga AELB sebagai Pihak Berkuasa Berkaitan di bawah Akta 304 bertanggungjawab memberi nasihat kepada Menteri Sains, Teknologi dan Inovasi (MOSTI) dan Kerajaan Malaysia mengenai perkara berkaitan dengan Akta 304, mengawal penggunaan tenaga atom, menubuhkan kerjasama saintifik berkaitan tenaga atom, dan melaksanakan obligasi yang timbul daripada perjanjian, konvensyen atau triti antarabangsa yang berkaitan dengan penggunaan tenaga atom secara aman. Keputusan berkaitan polisi, pengurusan kewangan dan strategi dibuat oleh Lembaga AELB dan diluluskan oleh Menteri MOSTI yang seterusnya memberi arahan kepada Ketua Setiausaha untuk tindakan di peringkat Kementerian.

Diterajui oleh Ketua Pengarah, AELB menjalankan operasinya menerusi pelbagai bahagian dan cawangan yang mempunyai tanggungjawab khusus di dalam perlesenan, pemeriksaan serta penguatkuasaan. Ketua Pengarah AELB melaksanakan program dan aktiviti yang berkaitan dengan perundangan jabatan dan melaporkan kepada Ketua Setiausaha MOSTI.

A Million Thanks

The Board pf AELB and the Department's top management would like to take this opportunity to thanks the Government of Malaysia, MOSTI, and other relevant Ministries, Government departments and agencies as well as the Department's international counterparts for their support and co-operation. We would also like to extend our appreciation to the Department's staff members for their commitment and dedication in performing their duties in order to achieve organizational goals which ensure that AELB will remain as an effective, credible and regulatory body.

Governance of AELB

AELB is a department under the Ministry of Science, Technology and Innovation (MOSTI). The board of the AELB as the relevant authority under Act 304 is responsible for advising MOSTI who is in charge of the Act, controlling the use of atomic energy, forging scientific co-operation to fulfil the obligations arising from legal agreements, conventions or international treaties that relate to the purpose of the peaceful uses of atomic energy. The Board of AEL's decisions regarding policies, financial management and strategies are endorsed by the Minister of MOSTI who then guides the Secretary General at the level of the Ministry

Led by the Director General, AELB operates through various divisions and branches with specific responsibilities in licensing, inspection and enforcement. The Director General of AELB implements the Department's regulatory programmes and activities and reports to the Secretary General of MOSTI.

Profil AELB

Penubuhan

Ditubuhkan pada 1 Februari 1985, AELB membolehkan Kerajaan Malaysia mengawal, memeriksa dan menguatkuasa aktiviti tenaga atom negara secara berkesan. Aktiviti tersebut meningkat dengan pesat pada tahun-tahun selepas 1968 apabila Kerajaan meluluskan Akta Bahan-bahan Radioaktif 1968 untuk mengawal penggunaan bahan radioaktif terutamanya di dalam bidang perubatan. Pada bulan April 1984, Parlimen Malaysia telah meluluskan Akta Perlesenan Tenaga Atom 1984 (Akta 304). Pada peringkat awal, Jabatan ini diletakkan di bawah Jabatan Perdana Menteri, dan dipertanggungjawabkan untuk melaksanakan fungsi mengikut Seksyen 3 Akta 304. Pada 27 Oktober 1990, AELB telah dipindahkan daripada Jabatan Perdana Menteri dan ditempatkan di bawah Kementerian Sains, Teknologi dan Inovasi (MOSTI). Kini, Akta 304 telah dinilai semula bagi memastikan kerelevanan dan keberkesanannya berterusan dalam memenuhi keperluan semasa.

Fungsi

- Memberi nasihat kepada Menteri dan Kerajaan Malaysia atas perkara berkenaan dengan Akta Perlesenan Tenaga Atom 1984 dan perkembangan berkaitan terutamanya mengenai implikasi perkembangan tersebut bagi Malaysia.
- Mengawal dan mengawasi pengeluaran dan penggunaan tenaga atom dan perkara yang berkaitan dengannya.
- Menubuh, menyenggara dan membangunkan kerjasama saintifik dan teknikal dengan mana-mana badan, institusi atau organisasi lain berhubungan dengan perkara bersangkutan dengan nuklear atau tenaga atom sebagaimana difikirkan sesuai oleh Lembaga bagi maksud-maksud yang terkandung dalam Akta Perlesenan Tenaga Atom 1984.
- Melaksana sepertimana diarahkan sedemikian oleh Kerajaan Malaysia, bagi memenuhi obligasi yang timbul daripada perjanjian, konvensyen atau triti berhubungan dengan perkara-perkara nuklear atau tenaga atom yang mana Malaysia menjadi satu pihak jika perjanjian, konvensyen atau triti itu ada hubungan dengan maksud-maksud yang terkandung dalam Akta Perlesenan Tenaga Atom 1984.
- Mengerjakan perkara lain yang timbul atau berbangkit daripada fungsi-fungsi Lembaga AELB di bawah Akta Perlesenan Tenaga Atom 1984 yang tidak berlawanan dengan maksud-maksud yang terkandung dalam Akta ini, sama ada diarahkan oleh Menteri atau tidak.

Peranan

- Memastikan keberkesanan fungsi penguatkuasaan AELB.
- Mencapai tahap keberkesanan dan ketelusan yang tinggi dalam operasi AELB.
- Menarik dan mengekalkan kakitangan cemerlang yang mempunyai pengetahuan, kemahiran dan kecekapan yang diperlukan.
- Melaksanakan aktiviti AELB dengan tekun, termasuk seperti berikut:

- Menyediakan peraturan, kod amali, standard, panduan dan nasihat.
- Melesenkan penggunaan tenaga atom.
- Melakukan pemeriksaan serta penguatkuasaan.
- Menjalankan penyelidikan perundangan.
- Melaksanakan kerjasama saintifik dan memenuhi obligasi di peringkat antarabangsa.
- Menangani kecemasan nuklear dan radiologi.
- Membangunkan budaya keselamatan.

Komitmen

- **Melindungi Sekuriti dan Keselamatan untuk Kesihatan dan Alam Sekitar**

  Dengan terbentuknya langkah-langkah dan keperluan peraturan SEKURITI berkaitan dengan bahan dan kemudahan nuklear, AELB dapat memastikan secara berkesan bahawa semua pemegang lesen beroperasi secara selamat setiap masa agar dapat melindungi KESELAMATAN orang awam serta persekitaran. AELB juga memastikan peralatan sinaran bagi tujuan perubatan dan KESIHATAN sentiasa digunakan dalam keadaan yang selamat, dan dalam masa yang sama membantu melindungi ALAM SEKITAR melalui perundangan yang relevan berkaitan dengan bahan dan kemudahan nuklear.

- **Kawalgunaan Aktiviti Nuklear untuk Tujuan Aman**

  Dalam mengawalselia penggunaan tenaga dan teknologi nuklear untuk memastikan ianya hanya digunakan untuk tujuan aman semata-mata, sebarang rancangan jangka masa panjang negara yang berkaitan dengan penggunaan tenaga nuklear dalam aktiviti aman yang lain akan sentiasa dipantau. AELB sentiasa memastikan komitmen dan sokongan negara terhadap Triti Ketidakcambahan (NPT) untuk Senjata Nuklear dan Perjanjian Kawalgunaan Agensi Tenaga Atom Antarabangsa (IAEA), termasuk kawalan eksport bahan dan teknologi nuklear. Malaysia, melalui AELB juga merupakan ahli kepada kawalan import/eksport bagi bahan dan kemudahan nuklear melalui perundangan negara.

PROFILE OF AELB

Establishment

198 enables the Malaysian Government to effectively control, inspect and enforce atomic energy activities in Malaysia. There was a rapid rise in such activities in Malaysia. There was a rapid rise in such activities after 1968 when the Government passed the Radioactive Substances Act 1968 to control the use of radioactive substance, primarily in the medical field. In April 1984, the Malaysian Parliament passed the Atomic Energy Licensing Act 1984 (Act 304). AELB was placed initially under the Prime Minister's Department with the responsibility to implement the functions stipulated under Section 3 of Act 304. In October 27, 1990, AELB was moved from the Prime Minister's Department to the Ministry of Science, Technology and Innovation (MOSTI). Act 304 has been reviewed so as to ensure its continued relevance and effectiveness to meet current requirements.

Functions

- Advising the Minister of Science, Technology and Innovation and the Government of Malaysia on matters relating to the Atomic Energy Licensing Act 1984 and developments pertaining thereto with particular reference to the implications of such developments for Malaysia
- Exercising and supervising over the production, application and use of atomic energy and matters incidental thereto
- Establishing, maintaining and developing scientific and technical co-operation with such other bodies, institutions or organisations in relation to nuclear
- matters or atomic energy as the Board thinks fit for the purpose of the Atomic Energy Licensing Act 1984.
- Performing as and when directed by the Government of Malaysia fulfil the obligations arising from agreements, conventions or treaties relating to nuclear matters or atomic energy to which Malaysia is a party where such agreements, conventions or treaties relate to the purposes of the Atomic Energy Licensing Act 1984.
- Undertaking such other things arising out of or consequential to the functions of the AELB Board under the Atomic Energy Licensing Act 1984, which are not inconsistent with the purposes of this Act, whether or not directed by the Minister.

Roles

- Ensuring the effectiveness of AELB's regulatory function.
- Achieving a high level of efficiency and transparency in AELB's operations.
- Attracting and retaining excellent staff with the required knowledge, skill and competency.
- Diligently carrying out AELB's activities, which include the following:
  - Providing the regulations, codes of practice, standards, guidelines and advice.
  - Licensing the usage of atomic energy.
  - Conducting the inspection and enforcement.
  - Carrying out scientific co-operation and complying with international obligations.
  - Dealing with nuclear and radiological emergencies.
  - Developing a safety culture

Commitments

- **Ensuring Security and Safety for the Protection of Health and the Environment**

  By establishing regulatory requirements and security measures pertaining to nuclear materials and facilities, AELB effectively ensures that licensees will be able to operate their facilities safely at all times, thus ensuring the SAFETY of everyone and protecting the environment. AELB also ensures the safe use of radiation equipment for medical and HEALTH purposes as well as helps protect the ENVIRONMENT through the use of relevant legislation on nuclear materials and facilities.

- **Safeguarding of Nuclear Activities for Peaceful Purposes**

  In safeguarding the use of nuclear energy and technology to ensure that they are strictly for peaceful purposes, the country's long-term objectives on embarking onto other peaceful nuclear energy applications will be facilitated. AELB ensures that Malaysia's political commitment and support for the Non-Proliferation Treaty (NPT) of Nuclear Weapons and the International Atomic Energy Agency (IAEA) Safeguards Agreement are in operation. Malaysia, through AELB, is also a party to international laws regarding import/export control of nuclear materials and facilities through national legislation.

Laporan Operasi

Mesyuarat pertama *EARTH-M*

Sejak 2011, IAEA telah membantu Malaysia membangunkan kebolehupayaan dalam penilaian keselamatan nuklear melalui *Norwegian Extra Budgetary Programme (IAEA-NOKEBP)*. Pada peringkat permulaan program, ia melibatkan pembelajaran yang mendalam mengenai sebahagian daripada teori penilaian melalui kelas metodologi. Untuk memastikan kemampanan berterusan dan perpindahan pengetahuan, program ini diperluaskan lagi dengan memperkenalkan program mentor. Projek mentor ini berterusan selama dua tahun dan dikenali sebagai *Expertise Development Thorough the Analysis of Reactor Thermal-Hydraulic for Malaysia (EARTH-M)*, di mana fokus utamanya adalah untuk membangunkan kecekapan dalam bidang *Deterministic Safety Assessment (DSA)* iaitu kaedah untuk menilai keselamatan reaktor penyelidikan nuklear dengan menggunakan kod computer RELAP5-3D© serta menyediakan kemahiran yang menyeluruh untuk menilai keselamatan pemasangan nuklear. Tambahan lagi, projek ini memberi kefahaman kepada IAEA tentang keberkesanan program latihan *DSA* ini.

Mesyuarat pertama *EARTH-M* telah diadakan pada 14-17 April 2014 di AELB dan Agensi Nuklear Malaysia serta beberapa organisasi lain.

Bengkel Serantau IAEA - ANSN /GRITG mengenai *Regulatory Approaches Needed for the Deployment of a Country's First Nuclear Power Plant Project*

Rangka kerja yang berkesan dan menyeluruh serta penubuhan badan kawalselia yang bebas merupakan komponen utama dalam infrastruktur keselamatan nuklear. Untuk tujuan penguatkuasaan, pelbagai jenis pendekatan pengawalseliaan iaitu berasaskan prestasi dan berasaskan preskriptif atau gabungan kedua-dua pendekatan perlu dipertimbangkan pada peringkat awal perlesenan program tenaga nuklear di Malaysia. Oleh itu, sebanyak sebelas delegasi yang kebanyakannya dari negara yang telah melaksanakan reaktor nuklear, dijemput untuk menghadiri *Regional Workshop on Regulatory Approaches Needed for the Deployment of a Country's First Nuclear power Plant Project* pada 19-23 Mei 2014 di ibu pejabat AELB, Dengkil. Bengkel tersebut berjaya dianjurkan oleh AELB di bawah rangka kerja *Asian Nuclear Safety Network (ANSN)* dari IAEA.

Objektif bengkel ini adalah untuk memberi bantuan dan panduan serta berkongsi pengalaman berkenaan jenis pendekatan pengawalan yang diamalkan serta berpotensi kepada negara-negara anggota. Para peserta menyatakan persetujuan mereka bahawa setiap negara boleh merancang pendekatan yang sesuai dengan rangka kerja pengawalseliaan mereka. Pada dua hari pertama, peserta diperkenalkan dengan standard keselamatan IAEA untuk menguruskan pendekatan pengawalan serta contoh dan pengalaman sebenar yang

dikongsi bersama pakar-pakar antarabangsa. Manakala pada dua hari seterusnya, latihan berkumpulan dan perbincangan telah dijalankan untuk memberi pandangan yang lebih baik berkenaan pendekatan pengawalan. Akhir sekali, setiap negara anggota membentangkan dasar negara mereka serta strategi keselamatan seperti yang dipersetujui daripada bengkel sebelum ini yang pernah dijalankan di Indonesia pada tahun 2013.

Bengkel IAEA mengenai *Self-Assessment Methodology and Tools* Menggunakan Perisian Komputer SARIS

Bengkel untuk persediaan penilaian kendiri infrastruktur keselamatan negara telah dijalankan adalah bersambung daripada bengkel sebelumnya iaitu bengkel *Self-Assessment for the Integrated Review of Infrastructure for Safety (IRIS)* yang diadakan pada 16-18 Disember 2013. Bengkel ini bertujuan untuk memperkenalkan perisian IAEA SARIS untuk ulasan kendiri dan penilaian infrastruktur keselamatan nuklear negara terhadap panduan keselamatan SSG-16 bertajuk *"Establishing the Safety Infrastructure for a Nuclear Power Programme"* dan *IAEA GSR Part 1 "Governmental, Legal and Regulatory Framework for Safety*". Oleh itu, untuk penyediaan *Integrated Regulatory Review Service (IRRS)* IAEA yang dirancang pada 2015, bengkel ini menyediakan platform bagi pembangunan kecekapan manusia dari agensi-agensi terlibat supaya cekap menggunakan kaedah ini.

Seramai 30 peserta daripada sembilan pihak berkuasa dan pihak berkepentingan seperti Kementerian Sains, Teknologi dan Inovasi, Malaysian Nuclear Power Corporation (MNPC), Agensi Nuklear Malaysia (MNA), Majlis Keselamatan Negara, Jabatan Alam Sekitar, Polis Diraja Malaysia, serta Kementerian Kesejahteraan Bandar, Perumahan Dan Kerajaan Tempatan terlibat secara aktif dalam bengkel ini.

Mesyuarat Serantau bagi *Strengthening an Effective Compliance Assurance Regime for the Safe Transport of Radioactive Material*

Penggunaan pesat bahan dan sumber radioaktif dalam industri dan perubatan menyebabkan peningkatan dalam permintaan pengangkutan untuk aktiviti tersebut. Dengan operasi pengangkutan yang semakin berkembang ini, peraturan-peraturan yang berkesan dan jaminan pematuhan terhadap keperluan dalam negara serta antarabangsa diperlukan sebagai kejayaan utama untuk memastikan pengangkutan bahan radioaktif yang selamat. Oleh itu, untuk mematuhi kehendak undang-undang dan peraturan, mesyuarat serantau di bawah Projek Kerjasama Teknikal RAS/9/067 "*Strengthening an Effective Compliance Assurance Regime for the Safe Transport of Radioactive Material*" yang dibiayai oleh Suruhanjaya Eropah, telah diadakan di ibu pejabat Lembaga Perlesenan Tenaga Atom (AELB), Dengkil, Selangor, Malaysia pada 26-30 Mei 2014. Di bawah projek RAS/9/067 ini, sokongan yang diberikan dijangka akan mengurangkan kelemahan pada pengangkutan bahan dan sumber radioaktif serta untuk menangani isu kelewatan penghantaran bahan dan sumber radioaktif.

Objektif utama mesyuarat ini adalah untuk mengkaji semula status pematuhan peraturan IAEA dalam keselamatan pengangkutan bahan dan sumber radioaktif di rantau ini, khususnya penekanan kepada kemajuan yang dicapai selepas mesyuarat

sebelumnya pada 2012-2013. Selain itu, setiap negara anggota perlu mengemaskini Pelan Tindakan Khusus, berdasarkan keutamaan yang dikenalpasti dan komitmen negara serta input IAEA yang telah dipersetujui untuk perlaksanaan projek tersebut untuk 2014-2015.

Mesyuarat selama lima hari tersebut dihadiri oleh wakil dari Bahrain, Bangladesh, China, Bahrain, Bangladesh, China, Indonesia, Iran, Iraq, Jordan, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, T.T.U.T.J. of T. Palestin A., Filipina, Qatar, Sri Lanka, Thailand dan Yemen. Dalam mesyuarat ini, peserta terlibat secara aktif dalam perbincangan dan "*Approach to Strengthen National Compliance Assurance Regime for the transport of radioactive material, Radiation Safety Management Information System (RASIMS)"* serta elemen utama "Thematic Safety Area (TSA) 7 -Transport Safety" diperkenalkan. Peserta juga memberikan maklum balas yang positif dan 15 ahli anggota membentangkan tindakan khusu mereka untuk meningkatkan jurang dalam bidang keselamatan pengangkutan. Tujuh daripada 12 elemen utama telah dikenalpasti sebgai keutamaan serantau dan tindakan yang telah dipersetujui untuk mengukuhkan jaminan pematuhan rejim bagi keselamatan pengangkutan.

Bengkel Serantau mengenai Long Term Issues Following a Nuclear or Radiological Emergency dan Mesyuarat Tahunan *Topical Group* in *Emergency Preparedness and Response*

Lembaga Perlesenan Tenaga Atom, di bawah *Emergency Response and Preparedness Topical Group* (ERPTG) dalam rangkaian *Asian Nuclear Safety Network* (ANSN) daripada Agensi Tenaga Atom Antarabangsa (IAEA) telah berjaya menganjurkan bengkel serantau mengenai *Long Term Issues Following a Nuclear or Radiological Emergency* dan mesyuarat tahunan *Topical Group in Emergency Preparedness and Response*, yang berlangsung pada pada 9-13 Jun 2014 di Dengkil, Selangor. Bengkel ini bertujuan untuk memberi panduan kepada negara anggota ANSN bagi urusan kecemasan penamatan fasa kecemasan dan peralihan serentak berlaku kepada keadaan pendedahan sedia ada dan/atau kembali kepada keadaan pendedahan yang dirancang. Acara tersebut dihadiri 15 wakil dari negara anggota seperti Bangladesh, China, Indonesia, Filipina, Vietnam, Thailand, Malaysia dam Jepun serta 16 peserta tempatan daripada lain-lain bidang.

Sesi bengkel dimulakan dengan perkongsian pengalaman mengenai kemalangan Fukushima dan Chernobyl yang disampaikan oleh kakitangan IAEA dan pakar luar. Siri ceramah dan perbincangan dilakukan berdasarkan modul latihan IAEA yang telah dikemas kini. Bengkel ini menyediakan platform untuk berbincang dan berkongsi pengalaman antara peserta untuk perlaksanaan kerjasama antarabangsa yang diperuntukkan oleh IAEA. Di samping itu, setiap negara turut membentangkan status negara mereka dalam persediaan pada tindak balas kecemasan dan keupayaan persediaan.

Pada bahagian kedua, mesyuarat tahunan *Topical Group* yang diadakan selama dua hari dipengerusikan oleh Dr. Okuno Hiroshi. Dalam mesyuarat tersebut, semua ahli mengemukakan dan mengkaji aktiviti pada tahun 2013 dan aktiviti yang dirancang pada 2014, untuk meningkatkan perlaksanaan aktiviti pada tahun 2014. Ahli-ahli *Topical Group* juga memberikan sokongang yang berterusan di bawah rangkaian ANSN dalam

usaha untuk membangunkan keupayaan setiap negara anggota.

Perundangan Subsidiari, Syarat Lesen dan Piagam Pelanggan.

Dalam usaha untuk memastikan keberkesanan proses penguatkuasaan radiasi dan aktiviti nuklear, dokumen panduan, syarat-syarat lesen dan prosedur kerja telah dinaik taraf supaya setanding dengan piawaian antarabangsa. Syarat-syarat lesen, keperluan dan proses penguatkuasaan untuk pengangkutan dan *Facilities of Category 1 & Category 2 Sources* telah dikaji semula oleh pasukan pemeriksaan. Pindaan telah dibentangkan kepada Jabatan Pelesenan semasa Mesyuarat Pelesenan.

Sistem de-merit ditubuhkan bagi peringkat pengendali radiografi individu (JPK). Pembangunan sistem ini dibuat dengan kerjasama E5000. Bagi memastikan pelanggan memahami konsep sistem ini, Hari Bertemu Pelanggan diadakan untuk menjelaskan kriteria sistem de-merit.

Penstoran dan kemudahan *bomb-pit* yang terjejas akibat banjir pada tahun 2013 atau pada tahun sebelumnya, telah diakses semula dan disahkan oleh pasukan pemeriksaan. Proses ini melibatkan pengumpulan dan analisis maklumat, pemeriksaan dan penyerahan kertas kerja untuk mengaudit forum.

Satu kajian juga telah dijalankan ke atas pematuhan dalam aktiviti radiografi industri untuk "*star rating*" bagi pemegang lesen. Kajian ini meliputi perbincangan tentang pengkategorian, penilaian dan *star rating* bagi pematuhan keselamatan.

Satu lagi kajian mengenai kemungkinan peranti pengesanan GPS pada peranti penyinaran mobil juga telah dijalankan (contoh: kamera gamma, *tracker pill*) yang merangkumi maklumat yang diambil daripada amalan antarabangsa, taklimat oleh pembekal GPS, perbincangan dengan pemegang lesen NDT dan penyediaan kertas kerja.

Mekanisme Proaktif untuk Melindungi Orang Awam dari Pendedahan kepada Radiasi

Dalam memulihkan penangkap kilat radioaktif yatim, satu kajian telah dijalankan mengenai perkara tersebut di sekitar Selangor. Kajian ini merangkumi pengumpulan data dari pangkalan data (rekod pendaftaran), pemeriksaan dan laporan akhir. Bajet untuk melupuskan semua penangkap kilat juga telah dicadangkan untuk dilakukan jika perlu.

Penubuhan Cawangan Gebeng di Pahang untuk Memantau Aktiviti NORM Lynas

Lima pegawai ditempatkan di cawangan Gebeng, dilengkapi dengan alat perkakasan pemeriksaan dan hanya memfokuskan dalam memantau aktiviti NORM oleh Lynas.

Peningkatan Pengetahuan Teknikal dan Maklumat

Perkongsian dan proses mengemaskini pengetahuan teknikal dan maklumat adalah penting dalam memperkasakan tindakan penguatkuasaan. Kursus latihan *In-house* untuk pegawai penguatkuasaan baru telah dijalankan:

- Latihan Prosedur Penguatkuasaan (Kursus Asas Pegawai Pemeriksa)
- Latihan kepada Inspektor

- Latihan Penyiasatan dan Integrasi kursus *Witness Techniques* dengan kerjasama PDRM
- Latihan Industri Radiografi Tahap 1
- Kursus Pegawai Perlindungan Sinaran

Pembangunan dan pengemaskinian peraturan, undang-undang, panduan dan dokumen lain yang berkaitan.

Teknologi nuklear dan sinaran perlu dikawal selia sebagai keperluan keselamatan, kawal selia dan kawal guna. Oleh itu, bengkel-bengkel IAEA dijalankan sebagai penilaian peraturan pembangunan program tenaga nuklear:

- Workshop on Conducting Self-Assessment using IAEA SARIS Tools (5-7 Mac 2014)
- Workshop on Regulatory Approaches for the authorization of NPP (ANSN(GRITG)) (19-23 Mei 2014)

Bermula tahun ini, *Nuclear Regulatory Newsletter* akan dikemaskini sekurang-kurangnya 2 penerbitan setiap tahun termasuk yang ada dalam laman web AELB dan Facebook Rasmi AELB.

Piawaian IAEA dan *International & National Industrial Standard* yang berkaitan juga diterima untuk memenuhi tanggungjawab kebangsaan dan kewajipan di peringkat antarabangsa. Penyerahan cadangan telah pun dibuat kepada Audit Forum (FA) dan penerimaan oleh beberapa *Industrial Standard* yang lain.

Pengurusan efektif untuk pelaksanaan National and International Cooperation dan cadangannya

Untuk memupuk kerjasama antara pihak yang berkaitan dengan sinaran dan nuklear di peringkat kebangsaan dan antarabangsa secara proaktif, dua mesyuarat pasukan petugas di peringkat kebangsaan telah pun dianjurkan oleh AELB dan Agensi Nuklear Malaysia. Di peringkat antarabangsa pula, pentaksiran bersama BAPETEN, Indonesia telah diselaraskan untuk bekas pemindahan bahan api dan kolam bahan api terpakai.

AELB juga menjalankan dan menyertai program anjuran MNPC untuk kajian ke atas infrastruktur perundangan dan peraturan atau pembangunan loji tenaga nuklear di Malaysia. Antara aktiviti yang dibuat adalah mesyuarat semakan draf Nuclear Power Regulatory Infrastructure Development Plan (NPRIDP), kajian kemungkinan dan pemeriksaan bersama dengan pihak polis dan Pejabat Ketua Pengawal Keselamatan Kerajaan Malaysia (CGSO).

Keberkesanan proses kawal selia untuk aktiviti sinaran dan nuklear

Tiga strategi telah pun dijalankan untuk mencapai keputusan optimum:

- Untuk menyeragamkan tindakan dan keputusan pemeriksa
- Untuk meringkaskan prosedur pemeriksaan kerana prihatin dalam peraturan tidak berkecuali ke atas perlanggaran berkaitan perundangan dan peraturan
- Untuk meningkatkan pengetahuan dan kecekapan dalam kawal selia.

Pemeriksaan berjadual / tidak berjadual dilakukan sekurang-kurangnya dua kali setahun dan kawal gunaan Pengesahan Inventori Fizikal (PIV) dilakukan minimum setahun sekali. Ini untuk memastikan pematuhan ke arah pelaksanaan syarat lesen.

Senarai semak pemeriksaan Reaktor TRIGA PUSPATI (RTP) juga disemak dan dikukuhkan dari segi keselamatan, kawal seliaan dan perlindungan fizikal, kawal gunaan serta rekod. Dokumen yang diterima dari pemegang lessen dan berkaitan dengan keselamatan, kawal seliaan dan kawal gunaan operasi reaktor dinilai dan disahkan mengikut piawaian kebangsaan dan IAEA.

Mesyuarat dengan pelbagai pihak seperti pihak berkuasa pelabuhan, agen perkapalan tempatan dan penghantar negara luar juga dianjurkan bagi menerima, menilai dan mengesahkan permohonan dan keputusan untuk Penghantaran Transit Bahan Nuklear/Pindah Kapal seperti yang diperlukan di bawah Akta 304 dan Akta 708.

Permonitoran kawasan dan alam sekitar menunjukkan paras sinaran adalah berada di bawah paras yang ditetapkan. Rutin permonitoran radiologikal dan persampelan alam sekitar juga dijalankan untuk menyokong aktiviti perlesenan dan kawal seliaan. Permonitoran ini adalah termasuk permonitoran radon/torium, pengukuran dos luaran dan persampelan alam sekitar di premis pemegang lessen. 22 kerja lapangan termasuk 776 sampel dihantar ke MNA untuk dianalisa atau tujuan analisa dalaman.

Semua Sistem Permonitoran Sinaran Alam Sekitar (ERMS) adalah dipastikan untuk ada dalam Sistem Permonitoran atas talian pada masa sebenar. Di sinilah semua peralatan yang dipasang akan memberikan data statistik supaya apa jua pengesanan akan diketahui dan diukur dengan cepat serta membantu pihak agensi penguatkuasaan yang lain seperti Agensi Perubatan Malaysia (MMA) dan Majlis Keselamatan Negara (MKN).

AELB juga Berjaya menjalankan aktiviti penilaian oleh penilai pihak ketiga terhadap fasiliti Lynas Advance Materials Plant (LAMP) seperti yang ditetapkan dalam syarat lesen. Penilai pihak ketiga yang dilantik adalah Uni-Technologies Sdn. Bhd. Dan Laporan Keputusan Pengesahan telah pun dipersetujui oleh pihak Lembaga.

Program kesedaran dalaman juga dianjurkan di pejabat AELB mengikut keperluan semasa.

- Penerangan tentang penggunaan Rad 7
- Penerangan tentang penggunaan meter tinjau
- Kursus Tentukuran Meter Tinjau
- Penerangan tentang peminjaman peralatan dan prosedur peminjaman TLD
- Latihan teknikal untuk *Handheld Radiation Detector and Indentifinder (Hardi)*

Memenuhi semua tanggungjawab kawal seliaan

AELB menerima permohonan dari Bahagian Kawal Seliaan IAEAuntuk penetapan Pemeriksa Kawal Gunaan atau menarik balik pemeriksa yang telah ditetapkan. Penilaian kecekapan teknikal juga dilakukan termasuk penyediaan dan penghantaran cadangan oleh AELB. Satu senarai pemeriksa Kawal Gunaan yanbg ditetapkan ke Malaysia juga dikemaskini dengan 20 pemeriksa yang telah diluluskan dan 12 pemeriksan yang ditarik balik menjadikan jumlah terbaru pemeriksa adalah seramai 384 orang.

Laporan berkenaan dengan kawal gunaan juga telah dihantar ke IAEA yang mengandungi Senarai Inventori Fizikal (PIL), Laporan Baki Bahan (MBR) dan Soal Selidik Maklumat Rekabentuk (DIQ) yang telah

disemak. Laporan IAEA berkenaan dengan kawalgunaan seperti penyataan inventori buku suku tahunan untuk bahan nuklear, ringkasan maklumat Perakaunan Bahan Nuklear, persamaan transit bahan nuklear dan ketidaksamaantransit/pernghantaran bahan nuklear semuanya disahkan oleh kumpulan instalasi AELB.

Pelaksanaan aktiviti kajian perundangan dengan kerjasama agensi berkaitan

AELB telah menjalankan Kajian Taburan Kanser dalam kalangan penduduk yang tinggal berdekatan dengan kawasan aktiviti pemproresan mineral. Syarikat Asian Rare Earth Sdn. Bhd. (ARE) sebagai pemegang lessen AELB telah pun membayar RM 499,780.00 untuk projek pencegahan kanser di sekitar tapak pelupusan ARE, Bukit Merah, Perak. Kajian lapangan untuk pengumpulan data dimulakan pada 1 September hingga 30 Oktober 2014 dan penemuan awal telah pun dibentangkan pada 10 Disember 2014.

AELB dan Universiti Malaysia Pahang (UMP) melalui satu MoU telah Berjaya menganjurkan satu kajian dalam impak kesihatan dan keselamatan ke atas pengguna produk berkaitan NORM. Melalui kajian ini, sembilan sampel barang pengguna telah pun diserahkan kepada UMP untuk dianalisa. Pembentangan keputusan tersebut dirancang untuk dilakukan pada suku pertama tahun 2015.

Pengukuhan mekanism kesiapsagaan dan dan tindakan

Dokumen berkaitan telah pun disemak untuk mewujudkan prosedur sebagai rujukan untuk kemalangan atau kejadian radiologikal. Garis panduan untuk pihak berkepentingan dan SOP telah dibangunkan untuk kakitangan AELB dalam menangani kejadian sumber tersekat dalam aktiviti *well logging*. Satu draf SOP untuk menggantikan 'RedPlan" telah pun dibawa ke MKN pada 22 Jun 2012 untuk penyelarasan dan persetujuan dari pelbagai agensi.

Latihan kemalangan radiologikal dengan agensi berkaitan seperti Tanjong Pelepas dan Lynas juga dijalankan di samping memastikan piawaian tindakan di peringkat kebangsaan. Latihan EX-STORM (pelbagai agensi) di Padang Besar telah dijalankan oleh Jabatan Bomba dan Penyelamat Malaysia (JBPM).

Untuk mengukuhkan lagi kecekapan tindakan kemalangan dan kesedaran di kawasan utama, Pasukan Kemalangan Nuklear (PKN) terlibat secara aktif dalam latihan kemalangan dalaman yang merangkumi klinik peralatan, kesiapsagaan dan program kesedara tindakan serta latihan bersama pemegang lessen. *ANSN/IAEA Regional Workshop on Long Term Issues following a Nuclear or Radiological Emergency* dan *Annual Meeting on the Topical Group on Emergency Preparedness and Response* dianjurkan di Ibu Pejabat AELB pada 9-13 Jun 2014.

Operational Reports

EARTH-M kick off Meeting

IAEA has been assisting Malaysia in developing its capability in nuclear safety assessment through Norwegian Extra Budgetary Programme (IAEA-NOKEBP) since 2011. Initial stage of programme involves learning an in depth theoretical part of safety assessment through classroom methodology. To ensure continuous sustainability and coherent knowledge transfer, the programme has been expanded to further step by introducing a mentoring programme. The two years mentoring project, known as Expertise Development Thorough The Analysis of Reactor Thermal-Hydraulic For Malaysia (EARTH-M) has been initiated with prime focuses of developing competency in the field of Deterministic Safety Assessment (DSA) methodology for safety analysis of nuclear research reactor using RELAP5-3D© computer code and provides extensive transferrable skills to evaluate the nuclear installation safety. In addition, this project provided an insight to the IAEA on the effectiveness of the IAEA training programme on DSA.

A kick off meeting of EARTH-M was conducted on 14-17 April 2014 at AELB and Malaysian Nuclear Agency (MNA) with participation from various related organizations.

IAEA - ANSN /GRITG Regional Workshop on Regulatory Approaches Needed for the Deployment of a Country's First Nuclear Power Plant Project

An effective and comprehensive regulatory framework and establishment of independent regulatory body are the major component in the nuclear safety infrastructure. On thought of that, for the purpose of regulatory enforcement, various kind of regulatory approach, performance based, prescriptive based, or combination of both approaches should be considered at the beginning stages of licensing of Malaysian first nuclear power programme. Therefore, total of eleven delegates mostly from embarking countries were invited to Regional Workshop on Regulatory Approaches Needed for the Deployment of a Country's First Nuclear power Plant Project on 19-23 May 2014 at AELB Headquarters', Dengkil. The workshop has successfully hosted by AELB under the framework of Asian Nuclear Safety Network (ANSN) of International Atomic Energy Agency.

The objective of the workshop is to provide assistance to member countries with information and experiences sharing toward various kinds of regulatory approaches are potentially being practiced. The workshop participants expressed their agreements that each country may apply appropriate approaches that suit bests with their regulatory framework. During the first two days, participants were introduced with the IAEA safety standards that dealing with regulatory approaches and actual experience and example shared with international experts. Following next two

days, group exercise and discussion were carried out to give better insights on regulatory approaches. Finally, each member country presented their current national policy and strategies for safety as agreed from the previous workshop conducted at Indonesia in 2013.

IAEA Workshop on Self-Assessment Methodology and Tools Using SARIS Computer Software.

Workshop for preparation of self-assessment of national safety infrastructure was conducted in conjunction to previous workshop of Self-Assessment for the Integrated Review of Infrastructure for Safety" (IRIS) held on 16-18 December 2013. The workshop aimed to introduce IAEA SARIS software for self-review and assessment of national nuclear safety infrastructure against the IAEA safety guide SSG-16 titled "Establishing the Safety Infrastructure for a Nuclear Power Programme" and IAEA GSR Part 1 "Governmental, Legal and Regulatory Framework for Safety". In addition to that, for the preparation of IAEA Integrated Regulatory Review Service (IRRS) planned in 2015, this workshop provided a platform for development of human competency from related agencies to familiar and competent to this methodology.

About 30 participants from nine relevant authorities and stakeholders such as Ministry of Science, Technology and Innovation, Malaysian Nuclear Power Corporation (MNPC), Malaysian Nuclear Agency (MNA), National Security Council, Department of Environment, Malaysian Royal Police, Ministry of Housing and Local Government actively involved in this workshop.

Regional Meeting on Strengthening an Effective Compliance Assurance Regime for the Safe Transport of Radioactive Material

Rapid growths of radioactive materials and sources based industry and medicine concurrently increases of transportation demand to support the activities. With the transportation operation growth in the region, effective regulations and compliance assurance with national and international requirements are needed as key success to ensure safe transport of radioactive materials. Due to importance to comply with the requirement while of current legislation and regulations, a regional meeting under the Technical Cooperation (TC) Project RAS/9/067 "Strengthening an Effective Compliance Assurance Regime for the Safe Transport of Radioactive Material" funded by the European Commission, was held at Atomic Energy Licensing Board (AELB) Headquarter in Dengkil, Selangor, Malaysia from 26 30 May 2014. Under the RAS/9/067 project, the support provided is expected to reduce the weakness in the safe transport of radioactive material and sources and to address the issue of delay of shipments of radioactive material and sources.

The main objective of the meeting was to review the status of compliance with IAEA regulations for the safe transport of radioactive material and sources in the region specifically emphasis on the progress made in 2012-2013 previous meeting. Besides that, each member state was required to update country-Specific Action Plan, based on the identified priorities and national commitment as well as on the agreed IAEA input for the project implementation in 2014-2015 cycles.

The five days meeting was attended by representatives from Bahrain, Bangladesh, China, Indonesia, Iran, Iraq, Jordan, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, T.T.U.T.J. of T. Palestinian A., Philippines, Qatar, Sri Lanka, Thailand and Yemen. During this meeting, participant are invited actively engaged in a discussion and also introduced IAEA Approach to Strengthen National Compliance Assurance Regime for the transport of radioactive material, Radiation Safety Management Information System (RASIMS) and key elements of Thematic Safety Area (TSA) 7 - Transport Safety. The participant provided very positive feedback, fifteen member states presented their specific action plans to improve the gaps in the area of transport safety. Seven out of twelve key elements had been identified as a regionally priority and action plans were agreed upon to strengthen the compliance assurance regime for transport safety.

Regional Workshop on Long Term Issues Following a Nuclear or Radiological Emergency and Annual Meeting of the Topical Group in Emergency Preparedness and Response.

Atomic Energy Licensing Board, under the Emergency Response and Preparedness Topical Group (ERPTG) in framework of Asian Nuclear Safety Network (ANSN) of International Atomic Energy Agency (IAEA) has successfully organized the Regional Workshop on Long Term Issues Following a Nuclear or Radiological Emergency and Annual Meeting of the Topical Group in Emergency Preparedness and Response, which took place on 9-13 June 2014 in Dengkil, Selangor. The workshop aimed to provide guidance to ANSN Member States for emergency arrangements to be in place for termination of an emergency phase and concurrent transition to an existing exposure situation and /or returning to a planned exposure situation. The event included 15 representatives from member countries such as Bangladesh, China, Indonesia, Philippines, Vietnam, Thailand, Malaysia, Japan and other 16 different field of local participants.

Workshop session was started with experience sharing about Fukushima and Chernobyl accident delivered by IAEA staff and external expert respectively. Series of lectures and discussions were conducted based on updated IAEA training modules. The workshop provided a platform to discuss and experiences sharing between participants for better lesson learned in deployment of international cooperation teams such as provided by IAEA. In addition to that, each country also presented their current national status on preparation on emergency response and preparedness capability.

At the second part, two days annual meeting between topical groups was chaired by Dr. Okuno Hiroshi. During the meeting, all members tabled and review their previous activities in 2013 and planned activities for next year (2014) for further improve and as well as planned activities for the topical group to be implemented in year of 2014. The group members also threw their intention to get continuous support under the ANSN network in order to develop capability of each member state.

Subsidiary legislation, license condition and client charter

In order to ensure the effectiveness of enforcement processes for radiation and nuclear activity, guidance documents, license conditions and work procedures were upgraded to be at par with international standards. License conditions, requirements and enforcement process for transportation and Facilities of Category 1 & Category 2 Sources were reviewed by the inspection team. The amendments were presented to the Licensing Department during the Licensing Meeting.

The de-merit system was established for individual radiography operators (JPK) level. The development of the system was in collaboration with E5000. To ensure that the clients understand the concept of the system, Meet Customers Day was organized to explain the criteria of the de-merit system.

Storage and bomb-pit facilities affected by flood in 2013 or aged were re-accessed and verified by the inspection team. This process involved collecting and analysis information, inspection and paperwork submission to audit forum.

A study was also conducted on compliance in industrial radiography activity for "star rating" of licensee. This study covers discussions of categorization, assessment and star rating for safety compliance. Another study on the feasibility of GPS tracking device on mobile irradiating devices was also conducted (e.g. gamma camera, tracker pill) which includes collecting information from international practices, briefing by the GPS supplier, discussions with the NDT licensee and paperwork preparation.

Proactive mechanism to protect public from under exposure to radiation

In securing and recovering the orphan radiactive lightning arrester, a study was conducted concerning unattended lightning arrester around Selangor. The study includes data collection from database (registration record), inspection and final report. A budget to dispose all lightning arrester was also proposed to be done if necessary.

Establish Gebeng branch in Pahang to monitor Lynas activity for NORM

Five officers were placed in Gebeng branch, well equipped with the inspection hardware to focus in monitoring the NORM activity by Lynas.

Enhancing technical knowledge and information

The sharing and updating process of technical knowledge and information are essentials in empowerment of enforcement actions. In-house training courses for new enforcement officer were conducted:

- Training on Enforcement Procedure (Kursus Asas Pegawai Pemeriksa**)**
- Training for Inspectors
- Training regarding Investigation and Integration Witness Techniques course in collaboration with RMP
- Training on Industrial Radiography Level 1
- Radiation Protection for Officer Course

Development and updating of regulations, legislations, guidance and other related documents

The radiation and nuclear technology need to be regulated towards safety, security and safeguard requirements. Therefore, IAEA workshops were conducted on the regulatory evaluation of nuclear power programme development:

- Workshop on Conducting Self-Assessment using IAEA SARIS Tools (5-7 March 2014)
- Workshop on Regulatory Approaches for the authorization of NPP (ANSN(GRITG)) (19-23 May 2014)

Starting this year, the Nuclear Regulatory Newsletter will be updated with at least two publications per year which includes on the AELB website and AELB Official Facebook.

Relevant IAEA and other International & National Industrial Standard were also adopted to fulfill national responsibilities and international obligations. Proposal submission have been done to Audit Forum (FA) for IAEA and other International Standard adoptions.

Effective management for implementation of National and International Cooperation and recommendations

To proactively foster cooperation with established National and International radiation and nuclear related parties, two task force meetings at national level have been conducted by AELB together with Malaysian Nuclear Agency. For international level, a joint assessment with BAPETEN, Indonesia was coordinated on fuel transfer cask and spent fuel pool

AELB also coordinated and participated in the event organized by MNPC for the study on legal and regulatory infrastructure or the development on nuclear power plant in Malaysia. Among the activities were review meeting of Nuclear Power Regulatory Infrastructure Development Plan (NPRIDP) draft, feasibility study, and joint inspection with the police and Chief Government Security Office (CGSO).

Effectiveness of enforcement process for radiation and nuclear activities

Three strategies have been carried out to achieve the optimum result:

- To standardize action and decision by Inspectors
- To simplify inspection procedure cognizant of the no-exception rule on violation pertaining to law and regulations
- To enhance knowledge and competency in enforcement

A scheduled / unannounced inspection were performed at least twice a year and the Physical Inventory Verification (PIV) safeguard will be done at least once a year. This is to ensure the compliance towards the implementation of license condition.

The TRIGA PUSPATI reactor (RTP) inspection checklist was also reviewed and strengthened in terms of safety, security and physical protection, safeguards and records. Documents received from licensee and related to reactor operational safety, security and safeguards were assessed and verified according to IAEA and national standard.

Meeting with relevant parties such as Port Authority, Local shipping agent, and foreign

forwarder was also organized to receive, assess and verify application and decisions on Nuclear Material Transit Shipment/Transshipment as required under Act 304 and Act 708.

Area and environmental monitoring were indicates that the radiation level was below the designated level. Routine radiological monitoring and environmental sampling were conducted to support licensing and enforcement activities. The monitoring includes radon/thoron monitoring, external dose measurement and environmental samplings at licensee premise. 22 field works involving 776 samples were sent to MNA to be analyzed or internal analysis.

All Environment Radiation Monitoring System (ERMS) were ensured to be available at real time online Monitoring System. This is where all equipment installed will provide statistical data so any detection are noticed and measured immediately and also assiss other enforcement agencies such as Malaysia Medical Agency (MMA) and National Security Council (MKN).

AELB successfully coordinate and facilitated a third party assessor assessment activities toward Lynas Advance Materials Plant (LAMP) facilities as prescribed under License Conditions. The new third party assessor appointed was Uni-Technologies Sdn. Bhd. and Verification Result Report has been agreed by The Board.

Awareness in-house programmes were also organised at AELB office based on the current requirements:

- **Briefing on the use of Rad 7**
- **Briefing on the use of Survey Meter**
- **Survey Meter Calibration Course**
- **Briefing on the loaning of equipment and loaning procedure of TLD**
- **Technical exercise for Handheld Radiation Detector and Indentifinder (Hardi)**

Fulfillment of all safeguards obligations

AELB received an application from IAEA Safeguards Division for designation of Safeguards Inspector or Withdrawn of designated Inspector. The technical competency evaluation was done as well as the preparation and submission of AELB recommendation. A list of IAEA Safeguards inspector designated to Malaysia has been updated with new 20 approved inspectors and 12 withdrawn inspectors making the new number of 384 inspectors.

Reports related to safeguards were also submitted to IAEA which consists of Physical Inventory Listing (PIL), Material Balance Report (MBR), and revised Design Information Questionnaire (DIQ). IAEA reports related to safeguards such as semi-annual statement of book inventory of nuclear material, summary on Nuclear Material Accounting information, nuclear material transit matching, and unmatched of transit/shipment of nuclear material were all verified by AELB installation team.

Implementation of regulatory research activities in cooperation with relevant agencies

AELB has coordinated the Cancer Distribution Studies among the residence who live nearby the mineral processing activities. Asian Rare Earth Sdn. Bhd. (ARE) as a licensee of AELB has paid RM 499, 780.00 to AELB for cancer prevalence project around the disposal site of ARE, Bukit Merah,

Perak. The field work for data collection was started on 1st September until 30th October 2014 and the preliminary findings were presented on 10th December 2014.

AELB and Universiti Malaysia Pahang (UMP) through a MoU have successfully organized a research on the health and safety impact on consumer product related on NORM. Throughout the research, nine samples of consumer goods have been handed to UMP to be analyzed. The results presentation was planned to be carried out in the first quarter of the year 2015.

Enhancement of preparedness and respond mechanism

Relevant documents were reviewed to establish procedure as reference for radiological incidents/accidents. The guideline for stakeholders and Standard Operating Procedure (SOP) were developed for AELB staff on dealing with stuck source event in well logging activities. A draft for SOP to replace 'RedPlan' has been raised to MKN on 22 June 2012 for coordination and agreement from various agencies.

Radiological emergency exercise with other relevant agencies such as Tanjong Pelepas and Lynas was conducted as well to ensure standardization of actions at national level. The EX-STORM exercise (multi-agencies) at Padang Besar was organized by Fire and Rescue Department of Malaysia (JBPM).

To enhance emergency response competency and awareness in key respond area, our Nuclear Emergency Team (PKN) actively engaged in internal emergency exercise which covered equipment clinic, preparedness and response awareness programme and joint exercise with the licensee. ANSN/IAEA Regional Workshop on Long Term Issues following a Nuclear or Radiological Emergency and Annual Meeting on the Topical Group on Emergency Preparedness and Response was organized at AELB headquarters on 9 to 13 June 2014.

PETUNJUK PRESTASI UTAMA (KPI) 2014

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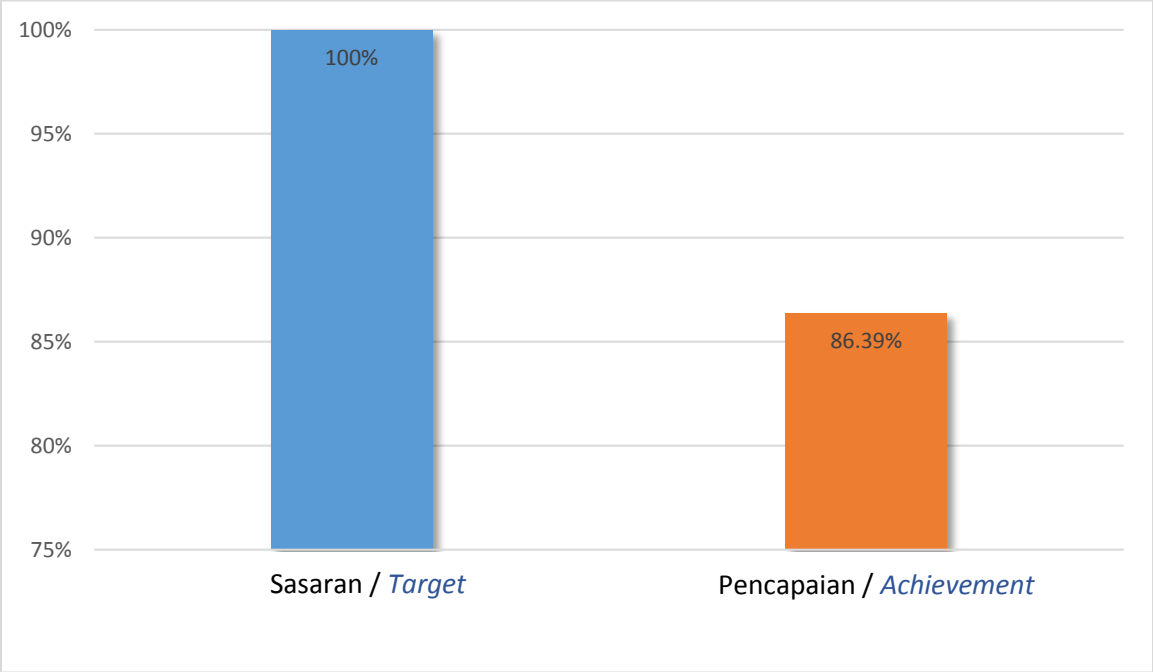
KEY PERFORMANCE INDICATOR (KPIs) 2014

Rajah 1: Kemajuan Keseluruhan AELB
Figure 1: Overall Progress of AELB

Keseluruhan / Overall	**Kemajuan / Progress**
Sasaran / Target	100 %
Pencapaian / Achievement	86.39 %



Rajah 2: Kemajuan yang Dicapai oleh Bahagian-bahagian AELB
Figure 2: Progress Achieved by the Divisions of AELB

Butir-butir ***Details***	**Kemajuan Bahagian Dasar, Kod dan Standard** ***Progress of Policy, Code and Standard Division (%)***	**Kemajuan Bahagian Perlesenan** ***Progress of Licensing Division (%)***	**Kemajuan Bahagian Penguat-kuasaan** ***Progress of Enforcement Division (%)***	**Kemajuan Bahagian Installasi Nuklear** ***Progress of Nuclear Installation Division (%)***	**Kemajuan Bahagian Khidmat Sokongan Teknikal** ***Progress of Technical Support Division (%)***	**Kemajuan Bahagian Khidmat Pengurusan** ***Progress of Administration Service Division (%)***	**Kemajuan Bahagian Komunikasi dan Multimedia** ***Progress of Communication and Multimedia Division (%)***
Teras Strategik 1: / ***Strategic Thrust 1*****:** Peningkatan rangka kerja pengendalian perundangan yang berkesan untuk keselamatan nuklear dan sinaran termasuk penubuhan badan penguatkuasa bebas *Enhancement of an effective legal governmental framework for radiation and nuclear safety, security and safeguards including an independent regulatory body*	60	-	-	83.34	-	-	-
Teras Strategik 2: / ***Strategic Thrust 2:*** Kerjasama berkesan dan penglibatan aktif di peringkat kebangsaan dan antarabangsa dalam isu-isu polisi dan teknikal bersabit dengan keselamatan, sekuriti dan kawalgunaan nuklear dan sinaran *Effective cooperation and active participation at national and international levels in technical and policy issues of radiation and nuclear safety, security and safeguards*	90	100	-	85.7	-	-	100

Teras Strategik 3: / *Strategic Thrust 3:* Peningkatan mekanisma untuk menentukan pematuhan pemegang-pemegang lesen terhadap keperluan peraturan dan kepuasan pelanggan *Enhancement of supervision mechanism towards licensee's compliance to the regulatory requirements and customer satisfaction.*	FA: 92 % Mesyuarat Lembaga / *Board Meeting:* 100 %	93.7	100	54.17	-	-	-
Teras Strategik 4: / *Strategic Thrust 4:* Peningkatan penyusunan berkesan untuk persediaan dan tindakan menghadapi kecemasan kemalangan dan insiden nuklear dan sinaran *Enhancement of effective arrangements for emergency preparedness and response for radiation and nuclear incidents and accidents*	-	-	-	-	-	-	-
Teras Strategik 5: / *Strategic Thrust 5:* Membina kemampuan dan kebolehan sinaran dan infrastruktur peraturan nuklear dan modal insan *Building capacity and capability of radiation and nuclear regulatory infrastructure and human capital*	82	70.3	100	63.1	-	-	80

Teras Strategik 6: / ***Strategic Thrust 6:*** Melindungi dan menjamin hak untuk membangunkan keselamatan teknologi nuklear bagi tujuan aman di Malaysia dan memupuk keyakinan awam dalam penggunaan secara aman *Protection and assurance of the inalienable rights to develop nuclear technology safely and securely for peaceful purposes in Malaysia and to foster public confidence in peaceful uses of radiation and nuclear technology*	Menunggu kelulusan Rang Undang-Undang Tenaga Atom / *Pending to the approval of Atomic Energy Bill*	100	-	100	-	-	100

Rajah 3: Petunjuk Prestasi Utama (KPI) 2014
Figure 3: Key Performance Indicators (KPI) 2014

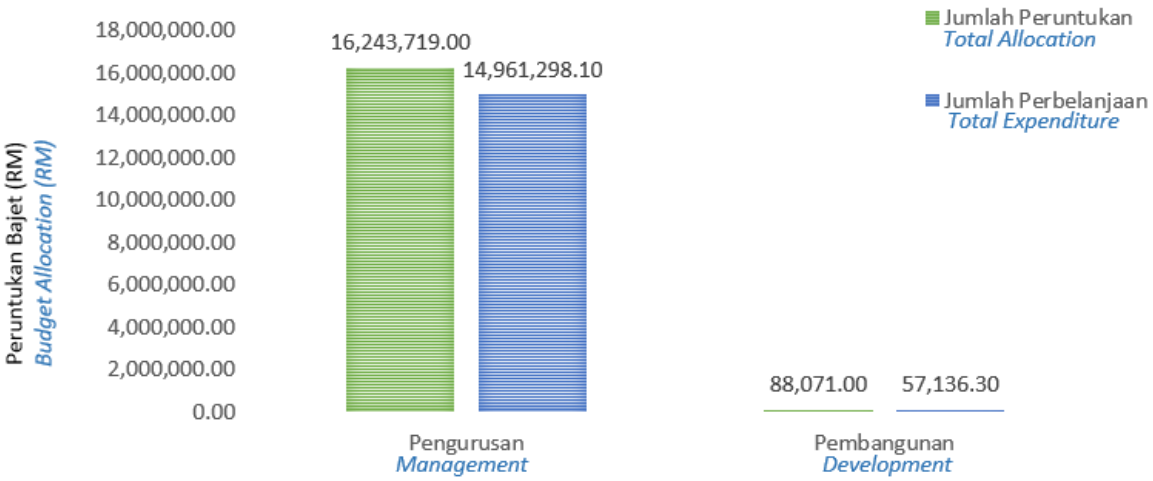
OBJEKTIF MOSTI *MOSTI'S OBJECTIVES*	PROGRAM *PROGRAMMES*	KPI 2014 *KPI 2014*	PENCAPAIAN *ACHIEVEMENTS*
Objektif 1 ***Objective 1*** Penghasilan Kekayaan *Wealth Creation*	Lesen, pengiktirafan (PPS, penyelia & pengendali industri radiografi) & Import/Eksport *Licence, certification (RPOs, supervisors & radiography industry workers) and Import/Export*	RM 1,500,000,00	RM 1,729,999.97
Objektif 2 ***Objective 2*** Penjanaan Ilmu Pengetahuan *Knowledge Generation*	Peperiksaan Persijilan PPS *Examination to certify RPOs*	**1265 calon** ***1265 candidates***	**1405 calon** ***1405 candidates***
	Pelaksanaan program latihan kebangsaan/serantau dan antarabangsa bagi tujuan meningkatkan keselamatan sinaran *Implementation of national/regional and international training programmes for enhancing regulation security*	**29 program latihan** ***29 training programmes***	**13 program latihan** ***13 training programmes***
	Mewujudkan kesedaran awam dalam bidang sains, teknologi dan inovasi *To create public awareness in the fields of science, technology and innovation*	**18 program kesedaran awam** ***18 public awareness programmes***	**26 program kesedaran awam** ***26 public awareness programmes***
Objektif 3 ***Objective 3*** Kesejahteraan Rakyat *Well-being of the People*	Pemeriksaan / *Inspection*	**700**	**1032**
	Insiden/Kemalangan Radiologi *Incidents/Radiological Accidents*	**-**	**3**
	Tindakan Perundangan *Legal Action*	**-**	**218**
	Purata Dedahan Dos Pekerja Sinaran (mSv/orang) *Average Exposure Dose of Radiation Workers (mSv/person)*	**20 mSv**	**0.30 mSv**
	Pembangunan Dokumen *Development of Documents*	**12 dokumen** ***12 documents***	**30 dokumen** ***30 documents***

Pencapaian dalam memenuhi tiga objektif utama MOSTI bagi tahun 2014 ditunjukkan dalam jadual di atas.

Achievements in meeting the three key objectives of MOSTI for 2014 are shown in the above table.

Rajah 4: Prestasi Kewangan 2014
Figure 4: Financial Performance 2014

Bil. *No.*	**Prestasi** *Performance*	**Jumlah Peruntukan** *Total Allocation* **(RM)**	**Jumlah Perbelanjaan** *Total Expenditure* **(RM)**	**Peratusan Perbelanjaan** *Percentage Expenditure* **(%)**
1.	Pengurusan *Management*	16,243,719.00	14,961,298.10	92.11
2.	Pembangunan *Development*	88,071.00	57,136.30	64.88
Jumlah ***Total***		**16,331,790.00**	**15,018,434.40**	**91.96**

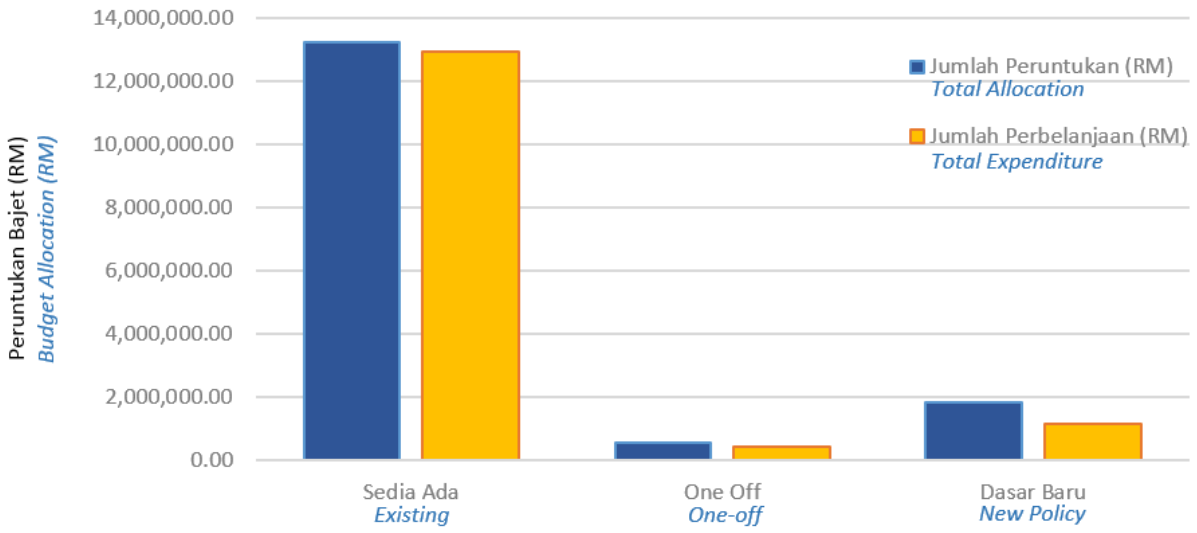


Prestasi kewangan 2014 mencatatkan jumlah peruntukan untuk perbelanjaan operasi adalah sebanyak RM 16,331,790.00, yang mana sebanyak 91.96 % atau RM 15,018,434.40 telah dibelanjakan.

Financial performance in 2014 recorded a total provision for operating expenses amounted to RM 16,331,790.00, where as much as 91.96 % or RM 15,018,434.40 was spent.

Rajah 5: Bajet Mengurus 2014
Figure 5: Operation Budget 2014

Bajet Budget	Peruntukan Allocation	Perbelanjaan Expenditure	Peratusan Percentage (%)
Sedia Ada Existing	13,235,900.00	12,938,445.34	97.75
One Off One Off	580,300.00	420,052.00	72.39
Dasar Baru New Policy	1,818,981.00	1,169,823.37	64.31
Jumlah **Total**	**15,635,181.00**	**14,528,320.71**	**92.92**



Jumlah peruntukan untuk perbelanjaan mengurus pada 2014 adalah sebanyak RM 15,635,181.00 yang mana sebanyak 92.92 % atau RM 14,528,320.71 telah dibelanjakan.

*Total allocation for o*peration expenses in 2014 was RM 15,635,181.00, of which 92.92 % or RM 14,528,320.71 was spent.

Rajah 6: Bajet Pembangunan 2014
Figure 6: Development Budget 2014

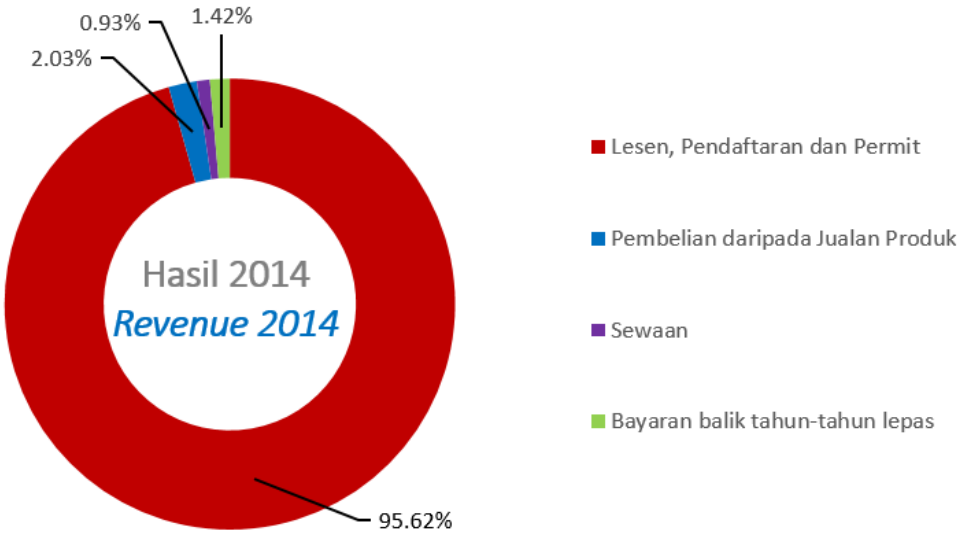
Projek Project	Peruntukan 2014 Allocation 2014 (RM)	Perbelanjaan Expenditure (RM)	Peratusan Percentage (%)
Kajian Penggubalan Perundangan dan Kawalseliaan Ke Arah Aplikasi Tenaga Nuklear Studies of Formulation of Legislation and Regulatory Towards Nuclear Energy Applications	-	-	-
Perolehan Makmal Bergerak Bagi Pasukan Bertindak Kecemasan Radiologi Kebangsaan Acquisition of Mobile Laboratory for the National Radiological Emergency Response Team	-	-	-
Perolehan Peralatan Sekuriti Bahan Nuklear dan Radioaktif Kebangsaan Acquisition of Equipment for Nuclear and Radioactive Materials Security National	-	-	-
Pembangunan Pusat Pengurusan Maklumat dan Multimedia serta bayaran pampasan tanah Development of Information and Multimedia Management Centre plus land acquisition compensation payment	-	-	-
Jumlah / Total	**-**	**-**	**-**

Pada tahun 2014, tiada bajet pembangunan dibuat kerana tiada keperluan perbelanjaan untuk tujuan tersebut.

In 2014, there was no development budget has been made since there is no requirement for the stated purpose.

Rajah 7: Hasil 2014
Figure 7: Revenue 2014

Kategori Category	Hasil Revenue	%
Lesen, Pendaftaran dan Permit Licences, Registration and Permit	1,654,212.20	95.62
Pembelian daripada Jualan Produk Procurement form Sales of product	35,039.72	2.03
Sewaan Rental	16,161.00	0.93
Bayaran balik tahun-tahun lepas Payment from Previous Year	24,587.05	1.42
Jumlah **Total**	**1,729,999.97**	**100**

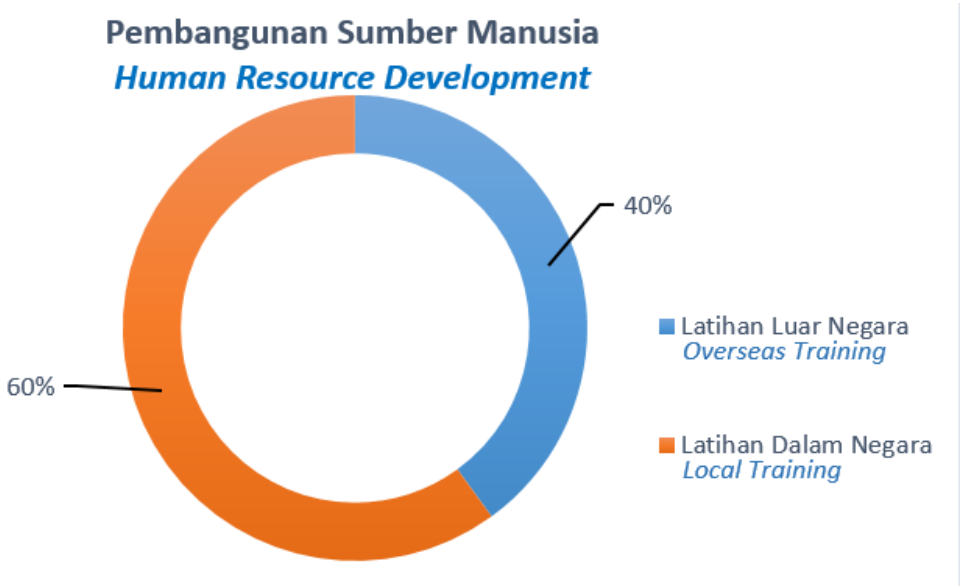


Pada tahun 2014, sebanyak RM 1,729,999.97 jumlah hasil terkumpul, yang mana sumber terbesarnya adalah 95.62 % daripada lesen, pendaftaran dan permit.

In 2014, total revenues collected by RM 1,729,999.97, where the largest source is 95.62 % from license, registration and permit

Rajah 8: Pembangunan Sumber Manusia 2014
Figure 8: Human Resource Development 2014

Program Latihan Training Programme	Jumlah Kakitangan Total Staff	%
Latihan Luar Negara Overseas Training	85	40
Latihan Dalam Negara Local Training	130	60
Jumlah **Total**	**215**	**100**



Pada tahun 2014, rajah menunjukkan seramai 215 kakitangan telah menghadiri pelbagai program latihan yang mana 60 % daripada program latihan tersebut dijalankan di dalam negara dan selebihnya di luar negara.

In 2014, a total of 215 staffs have attended various training in which 60 % of the training programme was carried out in the country while the rest was carried out abroad.

Rajah 9: Perjawatan 2014
Figure 9: Staffing 2014

Kategori Category	Kakitangan Staff	Diisi Filled	Kosong Vacant
P & P (Jusa C)* / M & P (Jusa C)*	1	1	0
P & P (Kump. A)* / M & P (Group A)*	56	51	5
Sokongan I (Kump. B) / Support I (Group B)	54	52	2
Sokongan II (Kump. C) / Support II (Group C)	32	30	2
Sokongan III (Kump. D) / Support III (Group D)	23	22	1
Jumlah / Total	**166**	**156**	**10**

*P & P = Pengurusan dan Profesional
*M & P = Management and Professional

Sejumlah 166 jawatan telah ditawarkan di AELB, sebanyak 156 jawatan telah diisi manakala 10 lagi masih kosong pada tahun 2014.

A total of 166 positions were offered in AELB, in which 156 posts have been filled and 10 posts were still vacant for the year 2014.

Rajah 10: Ringkasan Prestasi 2014
Figure 10: Performance Summary 2014

Bil. No.	Petunjuk Prestasi Performance Indicators	Pencapaian Achievements 2013	Pencapaian Achievements 2014	Perbezaan Difference %
1	Bilangan Permohonan Lesen: Number of Licence Applications:			
	Bilangan Permohonan Diterima Number Received	**1,640**	**1135**	**-44.5**
	Bilangan Diproses Number Processed	**1,640**	**1039**	**57.8**
2	Bilangan Pemeriksaan yang Dijalankan Number of Inspections Conducted	**733**	**1032**	**17**
3	Bilangan Kertas Kerja dan Kertas Maklumat untuk Mesyuarat Lembaga Number of Working Papers and Information Papers Presented at Board Meetings	**22**	**36**	**38.9**
4	Bilangan Maklumat Teknikal yang Dikeluarkan Number of Technical Information Circulars Issued	**17**	**30**	**43.33**
5	Bilangan calon yang Diiktiraf sebagai PPS Number of Candidates Accredited as RPOs	**537**	**369**	**-45.5**
6	Bilangan Calon yang Diiktiraf sebagai Penyelia Number of Candidates Accredited as Supervisors	**286**	**215**	**-33**
7	Bilangan Calon yang Menduduki Peperiksaan Perlindungan Sinaran Number of Candidates Sitting for Radiation Protection Examination	**591**	**598**	**1.2**
8	Tindakan Penguatkuasaan: Enforcement Actions:			
	Fail Penyiasatan Dibuka Investigations Files Opened	**52**	**53**	**0.95**
	Kes Dibawa Ke Mahkamah Cases Brought to Courts	**0**	**0**	**0**
	Penggantungan Pekerja Sinaran dan PPS / Suspended Radiation Workers and RPOs	**12**	**0**	**0**
	Pembatalan Lesen / Licence Cancelled	**0**		
	Penggantungan Lesen Licence Suspended	**1**	**0**	**1**
	Amaran Bertulis Dikeluarkan Written Warnings Issued	**15**	**29**	**14**
	Dalam Siasatan / Under Investigations	**14**	**24**	**26.32**

Bil. No.	Petunjuk Prestasi Performance Indicators	Pencapaian Achievements 2013	Pencapaian Achievements 2014	Perbezaan Difference %
9	Bilangan Permohonan Bahan Radioaktif, Radas Penyinaran dan Bahan Mineral Diproses: / Number of Applications of Radioactive Materials, Irradiation Apparatus and Duly Processed Minerals:			
	Import / Import	**2,069**	**2159**	**4.2**
	Eksport / Export	**1,250**	**2236**	**44.1**
	Pergerakan / Removals	**380**	**497**	**23.5**
10	Penguatkuasaan: / Enforcements:			
	Kecekapan Pegawai Penguatkuasaan Efficiency of Enforcement Officers	**25.3**	**100**	**74.20**
	Keberkesanan Pemeriksaan Effectiveness of Inspections	**26.9**	**78.88**	**51.98**
11	Pemprosesan Lesen: / Licence Processing:			
	Kecekapan Pegawai Penilai Efficiency of Assessment Officers	**96.4**	**97.7**	**1.3**

Jadual di atas menunjukkan ringkasan prestasi AELB berdasarkan pelbagai petunjuk prestasi daripada bilangan permohonan lesen yang diterima dan diproses hinggalah kepada pencapaian kecekapan para pegawai yang pegawai yang bertanggungjawab ke atas penguatkuasaan, pemeriksaan dan pemprosesan lesen.

The above table summaries the performance of AELB according to the various indicators ranging from the number of license applications received and processed to the efficiency of officers in charge of enforcement, inspection and license processing.

Rajah 11: Pembangunan Dokumen
Figure 11: Development of Documents

Bil. No.	Bil. Siri Dokumen Document Series No.	Tajuk Dokumen Perundangan Title of Legal Documents
1.	LEM/TEK/61 Pin.1	Panduan Demonstrasi dan Pameran Peralatan Sinaran *Demonstration and Exhibition of Radiation Equipment Guidelines*
2.	LEM/TEK/66 Pin.1	Panduan Penyediaan dan Pengujian Pelan Kecemasan Radiologikal dan Nuklear *Development and Verification of Radiological and Nuclear Emergency Plan Guidelines*
3.	LEM/TEK/18 Sem.1	Pengiktirafan dan Tugas Pegawai Perlindungan Sinaran *Accreditation and Duties of Radiation Protection Officer*
4.	LEM/TEK /40 Sem.2	Pengiktirafan dan Tugas Pengendali Perunding *Accreditation and Duties of Radiation Protection Consultant*
5.	LEM/TEK /67 Sem.1	Pengiktirafan dan Tugas Penasihat Perlindungan Sinaran *Accreditation and Duties of Radiation Protection Advisor*
6.	LEM/TEK /68	Pengiktirafan dan Tugas Pengendali Perunding Bebas *Accreditation and Duties of Freelance Radiation Protection Consultant*
7.	KOD/EMT/124	Keperluan Baru Untuk Pengiktirafan Pengendali Dan Pengendali Pelatih *New Requirements for the Accreditation of Operator and Trainee Operator*
8.	KOD/EMT/125	Keperluan Melesenkan Pengedar Utama *Pendant* Yang Mengandungi Bahan Radioaktif Semulajadi Di Bawah Akta 304 *The Need for License the Main Distributor of Pendant Containing Natural Occurring Radioactive Material Under Act 304*
9.	KOD/EMT/39 Sem.2	Keperluan Perlu Dipatuhi untuk Mengadakan Demonstrasi dan Pameran Peralatan Sinaran

		Requirements to be Complied to Conduct Demonstration and Exhibition of Radiation Equipment
10.	KOD/EMT/126	Pemegang Lesen Yang Hanya Menstor Dan Tidak Berurusan Dengan Aktiviti Mengguna Atau Mengendali Tidak Perlu Memiliki Meter Tinjau *Licensee that Only Store and Not Dealing With Use or Operate Activities No Need to Have Survey Meter*
11.	KOD/EMT/127	Kriteria Kemudahan Penstoran Bagi Tujuan Menstor Bahan Radioaktif *Criteria for Storage Facility for the Purpose to Store Radioactive Material*
12.	KOD/EMT/101Sem.1	Penetapan Tarikh Mula Lesen Bagi Permohonan Lewat Membaharui; dan Status Permohonan Lewat Membaharui Lesen Yang Telah Tamat Tempoh Sah *Ascertainment of Start Date of License Validity for Late Renewal Submission; and Status of Late Renewal Submission for Expired License*
13.	KOD/EMT/30 Sem. 2	Aktiviti yang memerlukan lesen Kelas H *Activity that requires Class H License*
14.	KOD/EMT/114 Sem.1	Senarai Kuasa Pengerusi dan Setiausaha Eksekutif Yang Telah Diwakilkan Berdasarkan Seksyen 67 Akta 304 *List of Delegation Power of Chairman and Executive Secretary Pursuant to Section 67 of Act 304*
15.	KOD/EMT/38 Sem.2	Pengkelasan Semula Kawasan Kawalan Kepada Kawasan Seliaan *Reclassification of Control Area to Supervise Area*
16.	KOD/EMT/128	Perbezaan Di Antara Pegawai Perlindungan Sinaran (PPS), Pengendali Perunding (PP), Pengendali Perunding Bebas (PPB) dan Penasihat Perlindungan Sinaran (RPA) *Differences Between Radiation Protection Officer (RPO), Radiation Protection Consultant (PP), Freelance Radiation Protection Consultant (PPB) and Radiation Protection Advisor (RPA)*
17.	KOD/EMT/16Sem. 1	Strategi (Interim) Lembaga Dalam Mengurus Sisa Radioaktif *Strategies (Interim) In Managing Radioactive Waste*

18.	KOD/EMT/129	Cetakan dan pengeluaran Sijil Lesen, Lampiran A dan Lampiran 1 yang telah diluluskan oleh Setiausaha Eksekutif Lembaga Perlesenan Tenaga Atom (Lembaga) di bawah Akta Perlesenan Tenaga Atom 1984 (Akta 304) melalui sistem atas talian eLesen-eSPP *Printing and Issuance of Certificate of License, Appendix A and Appendix 1 approved by the Executive Secretary of the Atomic Energy Licensing Board (Board) under the Atomic Energy Licensing Act 1984 (Act 304) through the online system eLesen-eSPP*
19.	KOD/EMT/130	Penetapan Tempoh Kelulusan Pengiktirafan Pengendali Perunding (PP) Dan Pengendali Perunding Bebas (PPB) Untuk Memberi Khidmat *Approval Period of Accreditation for Radiation Protection Consultant (PP) and Freelance Radiation Protection Consultant (PPB) to Provide Services*
20.	NP 01/2014	Notis Pemberitahuan Keperluan Baru Untuk Pengiktirafan Pengendali Dan Pengendali Pelatih *Notice on New Requirements for Accreditation of Operator and Trainee Operator*
21.	NP 02/2014	Notis Pemberitahuan Keperluan Melesenkan Pengedar Utama Pendant Yang Mengandungi Bahan Radioaktif Semulajadi Di Bawah Akta 304 *Notice on The Need for License the Main Distributor of Pendant Containing Natural Occurring Radioactive Material Under Act 304*
22.	NP 03/2014	Notis Pemberitahuan Pemeriksaan Perubatan Pra-Pekerjaan Hanya bagi Pekerja Di Kawasan Kawalan *Notice on Pre-employment Medical Examination Only For Control Area Worker*
23.	NP 04/2014	Notis Pemberitahuan Kawalan Aktiviti Import/ Eksport Amang Dan Sebarang Mineral Yang Mengandungi Bahan Radioaktif Semulajadi (*Natural Occuring Radioactive Material*, NORM) Bagi Kilang Amang Kecil *Notice on Control of Import / Export Activities of Amang and Any Mineral Containing Natural Occuring Radioactive Material (NORM) For Small Amang Factory*
24.	NP 02/2012 Sem.1	Notis Pemberitahuan Keperluan menghantar Penyata Pemilikan (AELB/BM/3) secara atas talian melalui sistem eLesen-eSPP apabila

		menerima bahan radioaktif, bahan nuklear atau radas penyinaran daripada pengguna yang bertujuan untuk dilupuskan *Notice on Requirement to Submit Return Possession (AELB / BM / 3) through eLesen-eSPP online system when receiving radioactive material, nuclear material or irradiating apparatus from the user for disposal purposes*
25.	NP 05/2014	Notis Pemberitahuan Cetakan dan pengeluaran Sijil Lesen, Lampiran A dan Lampiran 1 yang telah diluluskan oleh Setiausaha Eksekutif Lembaga Perlesenan Tenaga Atom (Lembaga) di bawah Akta Perlesenan Tenaga Atom 1984 (Akta 304) melalui sistem atas talian eLesen-eSPP *Notice of Printing and Issuance of Certificate of License, Appendix A and Appendix 1 approved by the Executive Secretary of the Atomic Energy Licensing Board (Board) under the Atomic Energy Licensing Act 1984 (Act 304) through the eLesen-eSPP online system*
26.	LEM/SPP/23	Panduan "Membawa Dalam Transit" dan "Pemindahan" Bahan Nuklear di Malaysia *Bring In Transit and Transfer of Nuclear Material in Malaysia Guideline*

Bil. No.	Bil. Siri Dokumen Document Series No.	Tajuk Dokumen Bukan Perundangan Title of Non-Legal Documents
1.	LEM/SPP/24	Spesifikasi Minimum Peralatan Pengesanan Sinaran Untuk Tujuan Sekuriti Nuklear *Minimum Specifications of Radiation Detection Equipment for Nuclear Security Purposes*
2.	LEM/SPP/25	Ujian Penerimaan Peralatan Personal Radiation Device (PRD) *Acceptance Test Personal Radiation Devices (PRD) Equipment*
3.	LEM/SPP/9A	Manual Permohonan Mengikuti Latihan Dalam Negeri, Latihan Luar Negara, Rekod dan Laporan Kehadiran Latihan Secara Atas Talian *Manual on Application Attending Internal Training, International Training, Records and Training Reports Via On-line*
4.	LEM/SPP/26	Ujian Penerimaan Peralatan *Radionuclide Identification Device* (RID)

Bil. No.	Bil. Siri Dokumen Document Series No.	Tajuk Dokumen Bukan Perundangan Title of Non-Legal Documents
		Acceptance Test Radionuclide Identification Device (RID) Equipment

Bagi mempertingkatkan kecekapan AELB dalam mengawal selia aktiviti tenaga atom di Malaysia, dokumen perundangan dan bukan perundangan telah dibangunkan dan digunapakai oleh AELB dan juga pemegang lesen yang menjalankan aktiviti tersebut. Semua dokumen yang disediakan sepanjang tahun 2014 ditunjukkan dalam jadual di atas.

In order to enhance the effeiciency in regulating AELB atomic energy activities in Malaysia, legislative and non-legislative documents have been developed and adopted by the AELB and also licensee who carry out such activity. All of the documents prepared during the year 2014 are shown in the table above.

Rajah 12: Penguatkuasaan 2014
Rajah 12: Enforcement 2014

Bil. No.	Tindakan Actions	Bilangan Total
Fail penyiasatan dibuka / Investigation files opened		
1	Kes dibawa ke mahkamah / Cases brought to court	0
2	Pembatan lesen / Licences cancelled	0
3	Penggantungan lesen / Licences suspended	0
4	Amaran bertulis dikeluarkan / Written warnings issued	29
5	Dalam siasatan / Under investigation	24
	Jumlah / Total	**53**

Pada tahun 2014, sejumlah 53 tindakan penguatkuasaan telah diambil oleh AELB. Mengikut undang-undang di bawah Akta 304.

In 2014, a total of 53 enforcement actions were taken by the AELB, in accordance to the enforcement law under Act 304.

Rajah 13: Perlesenan, Kebenaran dan Pengiktirafan 2014
Figure 13: Licensing, Approvals and Certification 2014

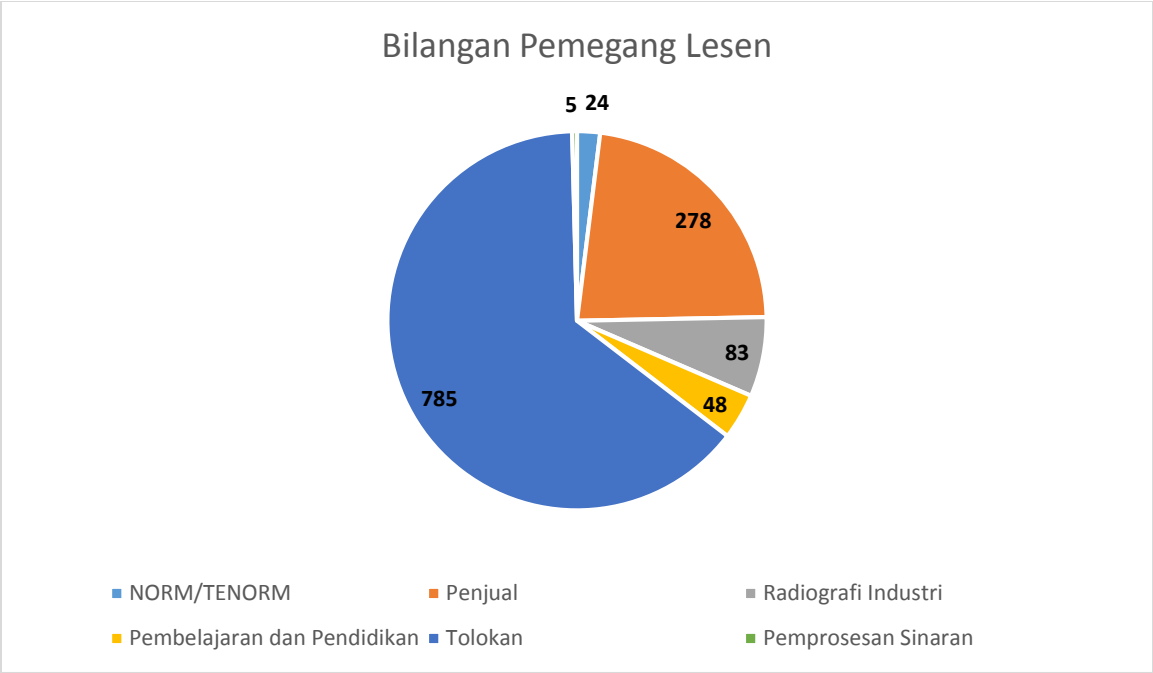
Bil. No.	Jenis Kelulusan Types of Approval	Bilangan Kelulusan No. of Approval
1	Permohonan Lesen / Licence Applications	1037
2	Kebenaran Dikeluarkan / Approvals Issued	4570
3	Pengiktirafan PPS / Certification of RPOs	369
4	Pendaftaran / Registration	417
	Jumlah / Total	6573

Jumlah permohonan lesen, kebenaran dikeluarkan pengiktirafan PPS dan pendaftaran mencapai 6573 untuk tahun 2014. Kelulusan dikeluarkan mencatatkan jumlah tertinggi sebanyak 4570.

Number of the license application, approval, certification and registration PPS reached 6573 for the year 2014. Approval issued was the highest number of 4570.

AKTIVITI BUKAN PERUBATAN / NON-MEDICAL ACTIVITY

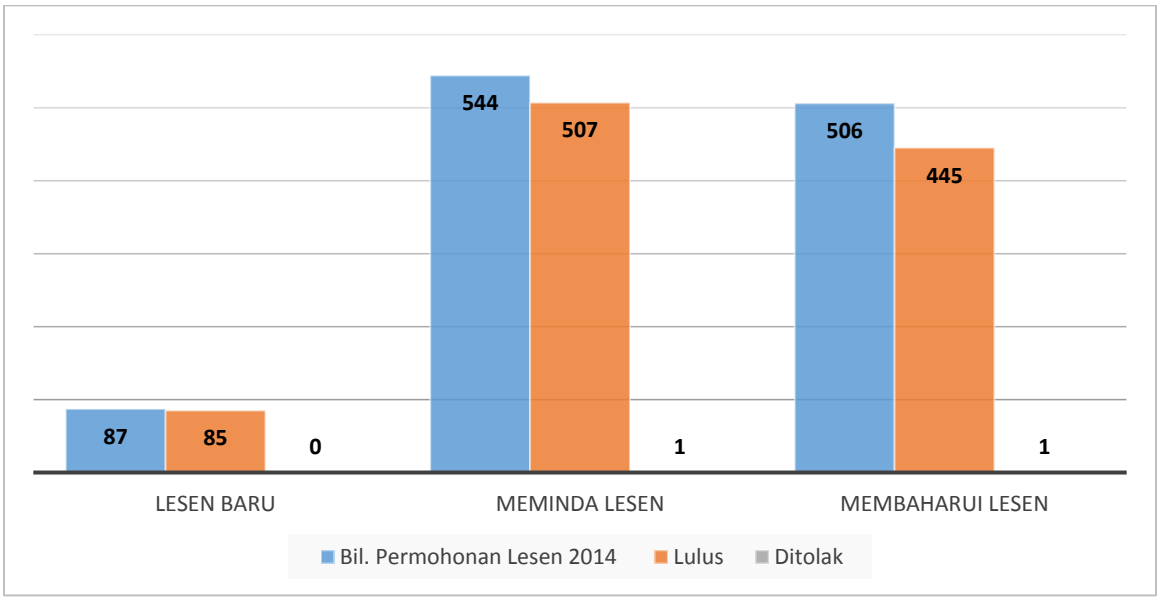
Rajah 14: Pemegang Lesen 2014
Figure 14: License Holder 2014



Tahun 2014 mencatatkan jumlah pemegang lesen mengikut jenis aktiviti berjumlah 1123 yang mana pemegang lesen Tolokan mendapat jumlah terbanyak iaitu 785 berbanding dengan pemegang lesen aktivit yang lain.

In 2014, noting the number of licensees by type of activity amounted to 1123, of which the licensee of gauges hold the highest number of 785 compared to other activities.

Rajah 15: Pemohonan Lesen 2014
Figure 15: License Applications 2014



Berdasarkan rajah di atas, jumlah permohonan lesen bagi permohonan membaharui lesen, meminda lesen dan permohonan lesen baru ialah 1137. Hanya dua permohonan yang tidak diluluskan oleh AELB.

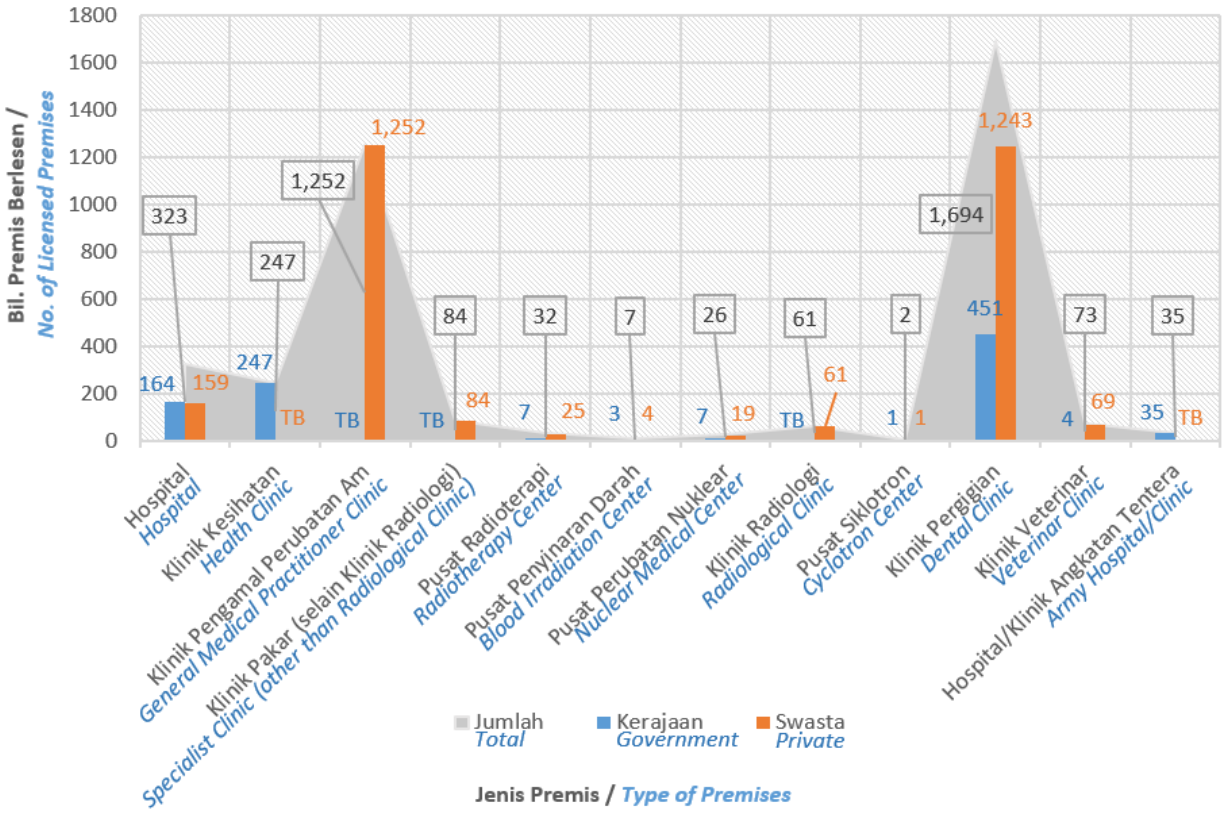
Based on the diagram above, the number of new license applications, renewal, and amendments was 1137. Only 2 applications was not approved by AELB.

AKTIVITI PERUBATAN / MEDICAL ACTIVITY

Rajah 16: Bilangan Premis Berdaftar dan Berlesen Mengikut Kategori Bagi Tahun 2014

Figure 16: Number of Registered and Licensed Premises By Category 2014

Jenis Premis Type of premise	Premis / Premise		Jumlah Total
	Kerajaan Government	Swasta Private	
Hospital Hospital	164	159	323
Klinik Kesihatan Health Clinic	247	TB	247
Klinik Pengamal Perubatan Am Genaral Medical Practitioner Clinic	TB	1,252	1,252
Klinik Pakar (selain Klinik Radiologi) Specialist Clinic (other than Radiological Clinic)	TB	84	84
Pusat Radioterapi Radiotherapy Center	7	25	32
Pusat Penyinaran Darah Blood Irradiation Center	3	4	7
Pusat Perubatan Nuklear Nuclear Medical Center	7	19	26
Klinik Radiologi Radiological Clinic	TB	61	61
Pusat Siklotron Cyclotron Center	1	1	2
Klinik Pergigian Dental Clinic	451	1,243	1,694
Klinik Veterinar Veterinar Clinic	4	69	73
Hospital/Klinik Angkatan Tentera Army Hospital/Clinic	35	TB	35
Jumlah Keseluruhan **Total**	**919**	**2,917**	**3,836**



Sumber: Seksyen Keselamatan Sinaran, Kementerian Kesihatan Malaysia
Source: Radiation Safety Division, Ministry of Health Malaysia

Pada tahun 2014, terdapat sebanyak 919 premis kerajaan yang berdaftar berbanding dengan 2917 premis swasta yang berlesen menjadikan jumlah keseluruhan premis yang terlibat dalam penggunaan sinaran mengion bagi maksud perubatan adalah 3836. Perincian blangan premis berdaftar dan berlesen mengikut jenis premis bagi kedua-dua sektor ditunjukkan dalam rajah di atas.

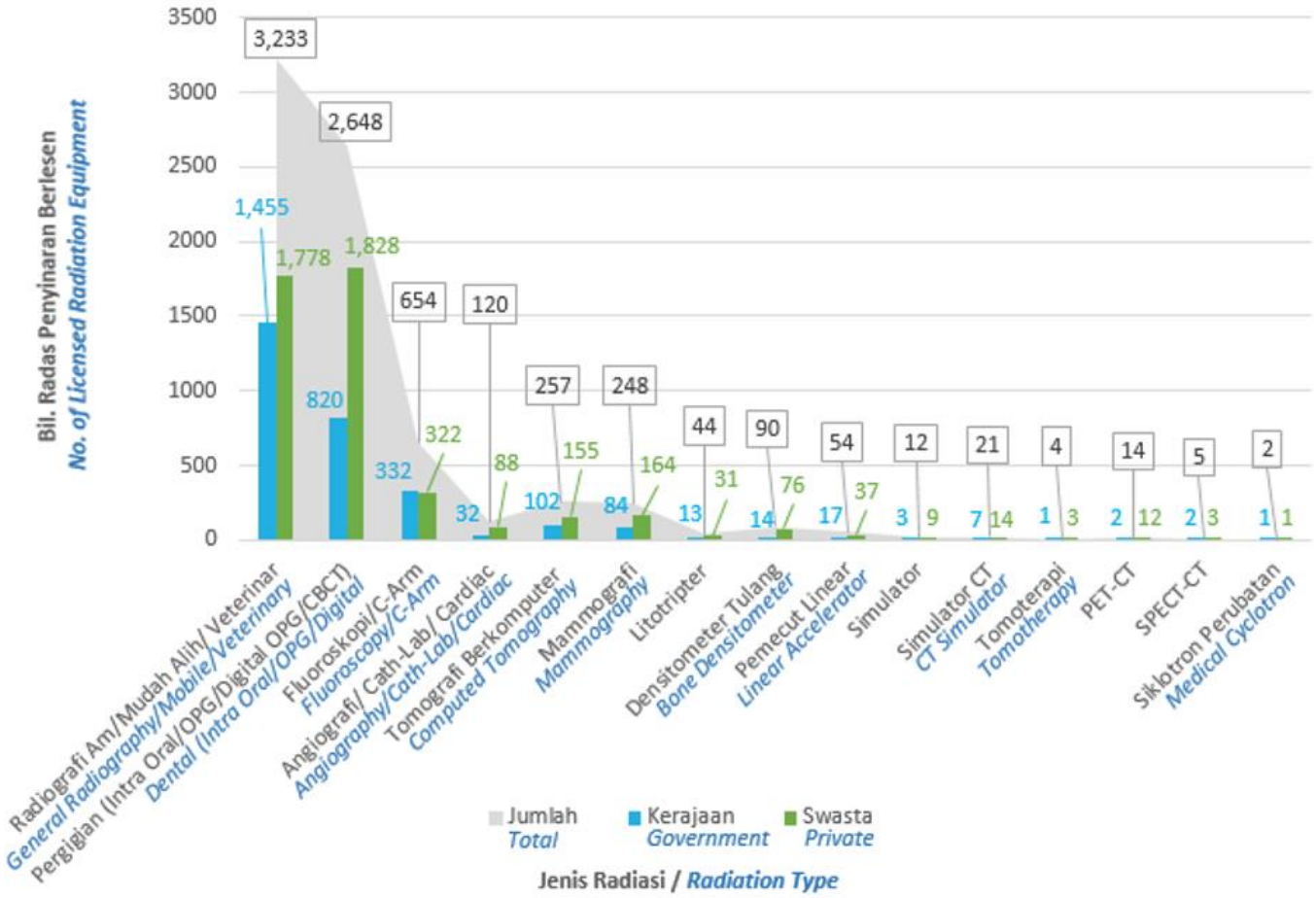
In 2014, there were 919 government premises registered over 2917 private premises licensed bringin the total number of premises involved in the use of ionizing radiation for medical purposes is 3836. Details of the number of registered licensed premises by type were shown as above.

Rajah 17: Jumlah Radas Penyinaran Mengikut Jenis / Kategori Berlesen / Pendaftaran sehingga 31 Desember 2014

Figure 17: Total Radiation Equipmen Accoriding to Type / License Category / Registration as at December 31, 2014

Jenis Radas Penyinaran Type of Irradiation Apparatus	Bilangan Radas / No. of Apparatus		Jumlah Total
	Kerajaan Government	Swasta Private	
Radiografi Am/Mudah Alih/ Veterinar General Radiography/Mobile/Veterinar	1,455	1,778	3,233
Pergigian (Intra Oral/OPG/Digital OPG/CBCT) Dental (Intra Oral/OPG/Digital OPG/CBCT)	820	1,828	2,648
Fluoroskopi/C-Arm Fluoroscopy/C-Arm	332	322	654
Angiografi/ Cath-Lab/ Cardiac Angiography/Cath-Lab/Cardiac	32	88	120
Tomografi Berkomputer Computed Tomography	102	155	257
Mammografi Mammography	84	164	248
Litotripter Litotripter	13	31	44
Densitometer Tulang Bone Densitometer	14	76	90
Pemecut Linear Linear Accelerator	17	37	54
Simulator Simulator	3	9	12
Simulator CT CT Simulator	7	14	21
Tomoterapi Tomotherapy	1	3	4
PET-CT	2	12	14
SPECT-CT	2	3	5
Siklotron Perubatan Medical Cyclotron	1	1	2
Jumlah Keseluruhan Total	**2,885**	**4,521**	**7,406**

Sumber: Seksyen Keselamatan Sinaran, Kementerian Kesihatan Malaysia
Source: Radiation Safety Division, Ministry of Health Malaysia



Sumber: Seksyen Keselamatan Sinaran, Kementerian Kesihatan Malaysia
Source: Radiation Safety Division, Ministry of Health Malaysia

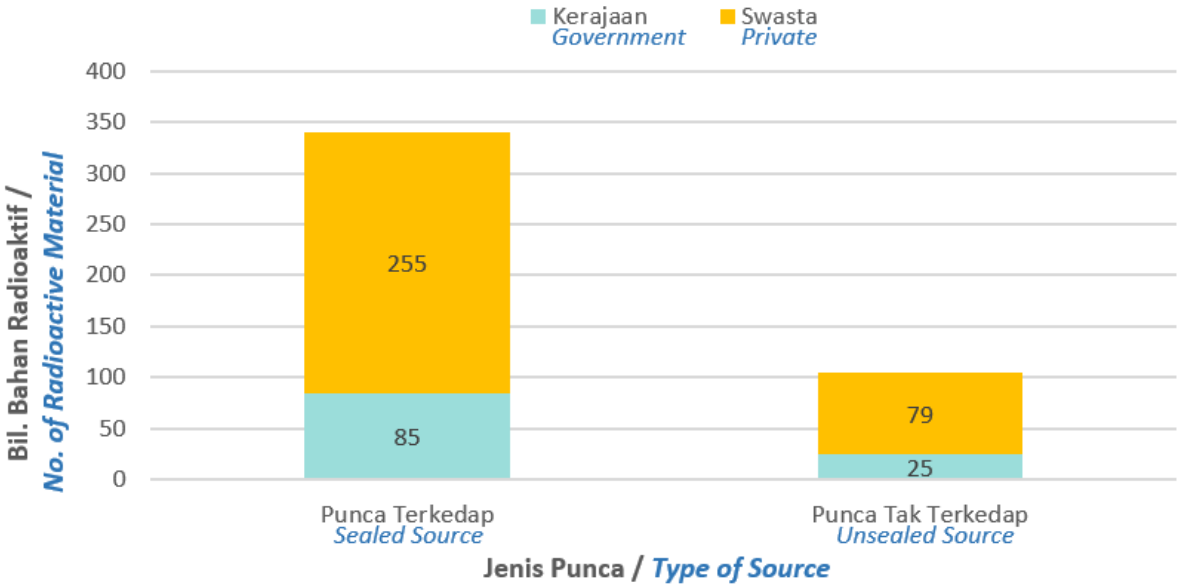
Bagi radas penyinaran pula, terdapat 2885 radas penyinaran berdaftar di sektor kerajaan manakala 4521 pula dilesenkan di sektor swasta. Perincian bilangan radas penyinaran yang terdapat di sektor kerajaan dan juga sektor swasta adalah seperti yang ditunjukkan dalam Rajah 17.

There were 2885 irradiation apparatus in the government sector while 4521 were licensed in the private secor. The details of irradiating apparatus contained in the both sectors are shown in Figure 17.

Rajah 18: Bilangan Bahan Radioaktif Berdaftar dan Berlesen Mengikut Jenis Bagi Tahun 2014

Figure 18: Number of Registered and Licensed Radioactive Material by Category for 2014

Jenis Punca Type of Source	**Bilangan Bahan Radioaktif** No. Of Radioactive Material		**Jumlah** Total
	Kerajaan Government	**Swasta** Private	
Punca Terkedap Sealed Source	85	255	340
Punca Tak Terkedap Unsealed Source	25	79	104
Jumlah Total	**110**	**334**	**444**



Rajah 19: Bilangan Lesen Yang Dikeluarkan Pada Tahun 2014

Figure 19: Number of Licensed Issued in 2014

Jenis Lesen Type of License	Bilangan Lesen No. of License
Permohonan Baru New Application	134
Pembaharuan Lesen License Renewal	799
Jumlah Keseluruhan **Total**	**933**

Rajah 20: Kelulusan 2014
Rajah 20: Approvals 2014

Bil. No.	Jenis Kelulusan yang Diproses Types of Approvals Processed	Bil. Permohonan No. of Applications
1	Bilangan Permohonan Import/Eksport Bahan Radioaktif, Radas Penyinaran dan Bahan Mineral Diproses: Number of Applications for Import/Export of Radioactive Materials, Irradiation Apparatus and Minerals Duly Processed:	
	Import / Import	2159
	Eksport / Export	2236
	Pergerakan / Removals	497
2	Pengkelasan Kawasan / Area Classifications	134
3	Bilangan Pinjaman yang Diluluskan: / Number of Approvals for Loans:	
	Radas Penyinaran / Radiation Equipment	19
	Bahan Radioaktif / Radioactive Materials	29
4	Ubah Lokasi Peralatan Sinaran / Relocation of Radioactive Equipment	144
5	Bilangan Kebenaran Melibatkan Pekerja: Number of Approvals Relating to Workers:	
	Peminjaman Pekerja Sinaran / Loan of Radiation Workers	61
	Pemberhentian Pekerja / Termination of Employment	3530
6	Pembinaan Kemudahan Penstoran / Construction of Storage Facilities	102
7	Transit Bahan Nuklear / Transit of Nuclear Substance	22
8	Pengurusan Bahan-bahan Buangan: PELUPUSAN Management of Discarded Materials: DISPOSABLE	
	Bahan Radioaktif / Radioactive Materials	1127
	Radas Penyinaran / Radiation Equipment	209
	Penangkap Kilat Radioaktif / Radioactive Lightning Arrester	0
9	Pemasangan/Uji/Senggara Radas Penyinaran Installation/Testing/Maintenance of Radiation Equipment	3368
10	Melakukan Kerja-kerja Radiografi di Kawasan Awam Conducting Radioactive Works in Public Places	98
11	Kemudahan Bilik Dedahan / Exposure Room Facilities	34
12	Pameran/Demonstrasi Peralatan Radioaktif Exhibition/Demonstration of Radiation Equipment	170
13	Pertukaran Alamat Syarikat / Change of Addresses of Companies	105
14	Pertukaran Orang Bertanggungjawab Terhadap Lesen Change of Persons Responsible for Licensing	598
15	Bilangan Pembubaran Lesen / Number of Licences Dissolved	36
16	Designasi Inspektor Kawalgunaan IAEA Designation of IAEA Safeguards Inspectors	37
17	Pembatalan Inspektor Kawalgunaan IAEA Cancellation of IAEA Safeguards Inspectors	19
	Jumlah / Total	**14734**

AELB telah memproses sebanyak 14734 jenis kelulusan seperti yang ditunjukkan dalam rajah di atas, untuk tahun 2014.

AELB has processed a total of 14734 type of approval as shown in the diagram above for the year 2014.

Rajah 21: Statistik Permohonan Kebenaran Pekerja 2014
Rajah 21: Statistic on Applications for Approvals of Workers 2014

Bil. No.	Keputusan Permohonan Application Results	Lulus Passed	Gagal Failed
1.	Pemberhentian Pekerja Sinaran Termination of Radiation Workers	3530	0
2.	Pinjaman Pekerja Loan of Workers	61	0
3.	Pengiktirafan Khidmat Juruperunding Service Certification of Consultants	405	80
4.	Pengiktirafan Pegawai Perlindungan Sinaran Certification of RPOs	369	260
5.	Pengiktirafan Pengendali Pelatih Certification of Trainee Operators	213	115
6.	Pengiktirafan Pengendali Senggaraan Certification of Maintenance Operators	300	184
7.	Pengiktirafan Pengendali Sinaran Certification of Radiation Operators	2466	417
8.	Pengiktirafan Penyelia Certification of Supervisors	215	106
9.	Pertukaran Orang Bertanggungjawab Terhadap Lesen Transfer of Persons Responsible for Licences	382	174
10.	Designasi Inspektor Kawalgunaan IAEA Designation of IAEA Safeguards Inspectors	37	0
11.	Pembatalan Inspektor Kawalgunaan IAEA Withdrawn of IAEA Safeguards Inspectors	19	0
12.	Pengiktirafan Pengendali Reaktor Penyelidikan Certification of Research Reactor Operator	0	0
13.	Pengiktirafan semula Pengendali Reaktor Penyelidikan Re-certification of Research Reactor Operator	0	0
	Jumlah / Total	**7997**	**1336**

Untuk tahun 2014, keputusan permohonan seperti pembaharuan, pemberhentian, pinjaman, pensijilan dan pemindahan telah dibahagikan kepada kategori lulus dan gagal. Jumlah yang dicatat bagi setiap kategori adalah 7997 (lulus) dan 1336 (gagal).

For the year 2014, the results of application for renewal, termination, loans, certification and transfer has been derived into categories of pass and fail. The amount charged for each category is 7997 (passed) 1336 (failed).

Rajah 22: Keputusan Peperiksaan PPS Mengikut Aktiviti bagi Tahun 2006-2014
Rajah 22: Examination Results for RPOs According to Activities for the Period 2006-2014

Tahun Year	Keputusan Results	Tolokan Gauges	Penjualan Sales	NORM/ TENORM NORM/ TENORM	NDT NDT	Pengajaran & Penyelidikan Education & Research	Proses Sinaran Radiation Process	Jumlah Total
2006	Lulus / Passed	171	67	15	23	-	-	276
	Gagal / Failed	167	49	21	23	-	-	260
2007	Lulus / Passed	215	36	14	11	-	-	276
	Gagal / Failed	336	46	29	45	-	-	456
2008	Lulus / Passed	200	23	18	10	-	-	251
	Gagal / Failed	314	42	22	41	-	-	419
2009	Lulus / Passed	161	35	11	11	7	7	232
	Gagal / Failed	325	63	38	63	6	3	498
2010	Lulus / Passed	169	26	8	8	4	8	223
	Gagal / Failed	278	53	17	56	0	9	413
2011	Lulus / Passed	106	24	9	8	13	2	162
	Gagal / Failed	295	54	26	30	9	5	419
2012	Lulus / Passed	115	25	8	23	6	6	183
	Gagal / Failed	247	48	19	45	5	3	367
Tahap / Level		**Tahap 1 / Level 1**		**Tahap 2 / Level 2**		**Tahap 3 / Level 3**		**Total**
2013	Lulus / Passed	0		6		118		124
	Gagal / Failed	4		23		389		416
2014	**Lulus / Passed**	**2**		**7**		**134**		**143**
	Gagal / Failed	**7**		**32**		**412**		**451**

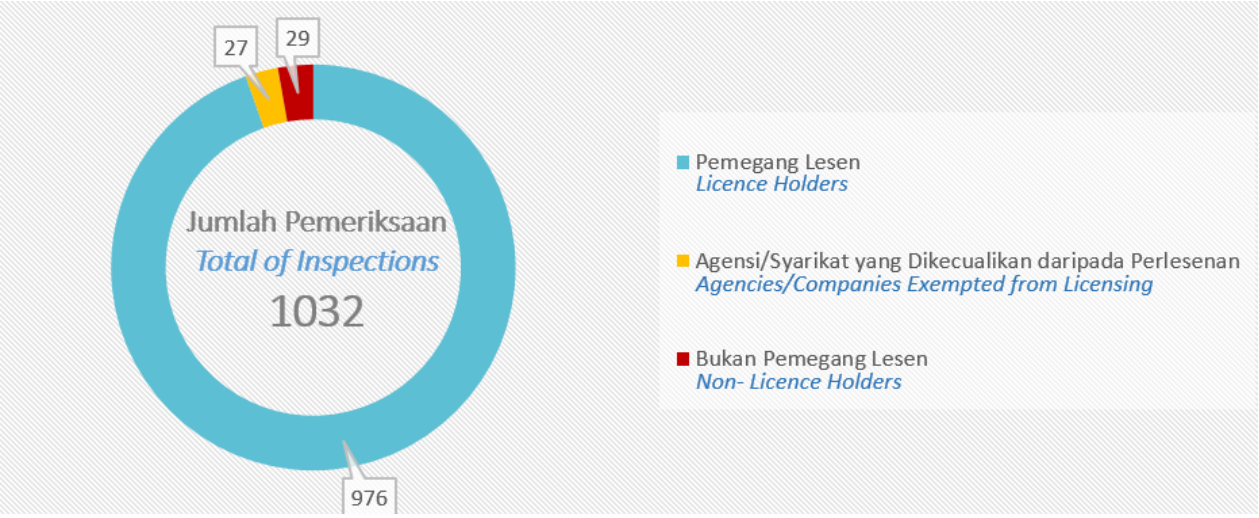
Tahun 2014, mencatatkan seramai 591 calon telah menduduki peperiksaan PPS, yang mana 143 calon lulus manakal 451 calon gagal. Rajah di atas menunjukkan keputusan peperiksaan PPS mengikut kategori dari tahun 2006 hingga 2014.

In 2014, 591 candidates were recorded sit for PPS examination, in which 143 candidates have passed while 451 have failed. The figure above shows the results of the examination from 2006 to 2014.

PENGUATKUASAAN
ENFORCEMENT

Rajah 23: Pemeriksaan 2014
Figure 23: Inspections 2014

Bil. / No.	Pemeriksaan/Serbuan / Inspection/Raid	Pencapaian / Achievements
1	Pemegang Lesen / Licence Holders	976
2	Agensi/Syarikat yang Dikecualikan daripada Pelesenan Agencies/Companies Exempted from Licensing	27
3	Bukan Pemegang Lesen / Non- Licence Holders	29
	Jumlah / Total	**1032**



Pada tahun 2014, sejumlah 1032 pemeriksaan / serbuan telah dijalankan oleh AELB. Kebanyakan pemeriksaan ini dijalankan terhadap pemegang lesen, diikuti oleh bukan pemegang lesen dan agensi/syarikat yang dikecualikan daripada perlesenan.

In 2014, a total of 1032 inspections / raid were carried out by AELB. Most of the inspections were conducted on licensees, followed by non-licensees and agencies /companies exempted from licensing.

Rajah 24: Tindakan Perundangan 2014
Figure 24: Regulatory Actions 2014

Tindakan Bersabit Peraturan Regulatory Actions	2006	2007	2008	2009	2010	2011	2012	2013	2014
Arahan Henti Operasi Stop Work/Operation Order	97	89	57	49	64	97	75	68	64
Amaran Bertulis dan Peringatan Written Warnings & Reminders	43	71	14	23	26	35	37	64	72
Pendakwaan dan Penggantungan Lesen Prosecution & Suspension of Licence	0	3	3	0	2	3	0	1	0
Penggantungan Pengiktirafan Suspension of Certification	0	21	24	18	37	40	0	12	29
Siasatan / Investigations	23	47	13	31	47	46	31	52	53
Jumlah / Total	**163**	**231**	**111**	**121**	**176**	**221**	**143**	**197**	**218**

Tahun 2014 juga mencatatkan 218 tindakan perundangan yang telah diambil, yang mana tindakan amaran bertulis dan peringatan menunjukkan bilangan yang tertinggi iaitu 72. Rajah menunjukkan tindakan perundangan yang diambil dari tahun 2006 hingga 2014.

2014 also recorded 218 regulatory actions taken, in which writte warnings and reminders shows the highest number of 72. The figure above shows the total regulatory actions taken from 2006 to 2014.

Rajah 25: Aduan Awam 2014
Figure 25: Public Complaints 2014

Aktiviti / Activities	Bil. Aduan Diterima No. of Complaints	Tindakan Pemeriksaan AELB Inspection Actions by AELB
Orang Awam / General Public	15	**15**
Kemalangan Sinaran / Radiation Accidents	3	**3**
Dalaman / In-house	0	**0**
Jumlah / Total	**18**	**18**

Sebanyak 18 aduan awam telah diterima pada tahun 2014 iaitu dari kategori orang awam dan kemalangan sinaran. AELB telah menyelesaikan semua aduan dengan mengambil tindakan pemeriksaan.

A total of 18 complaints were received in 2014 from the category of general public and radiation accidents.AELB has completed all of the complaints by taking measures of inspection.

Rajah 25: Dos Tahunan Pekerja Sinaran 2014
Figure 25: Radiation Workers Annual Dose 2014

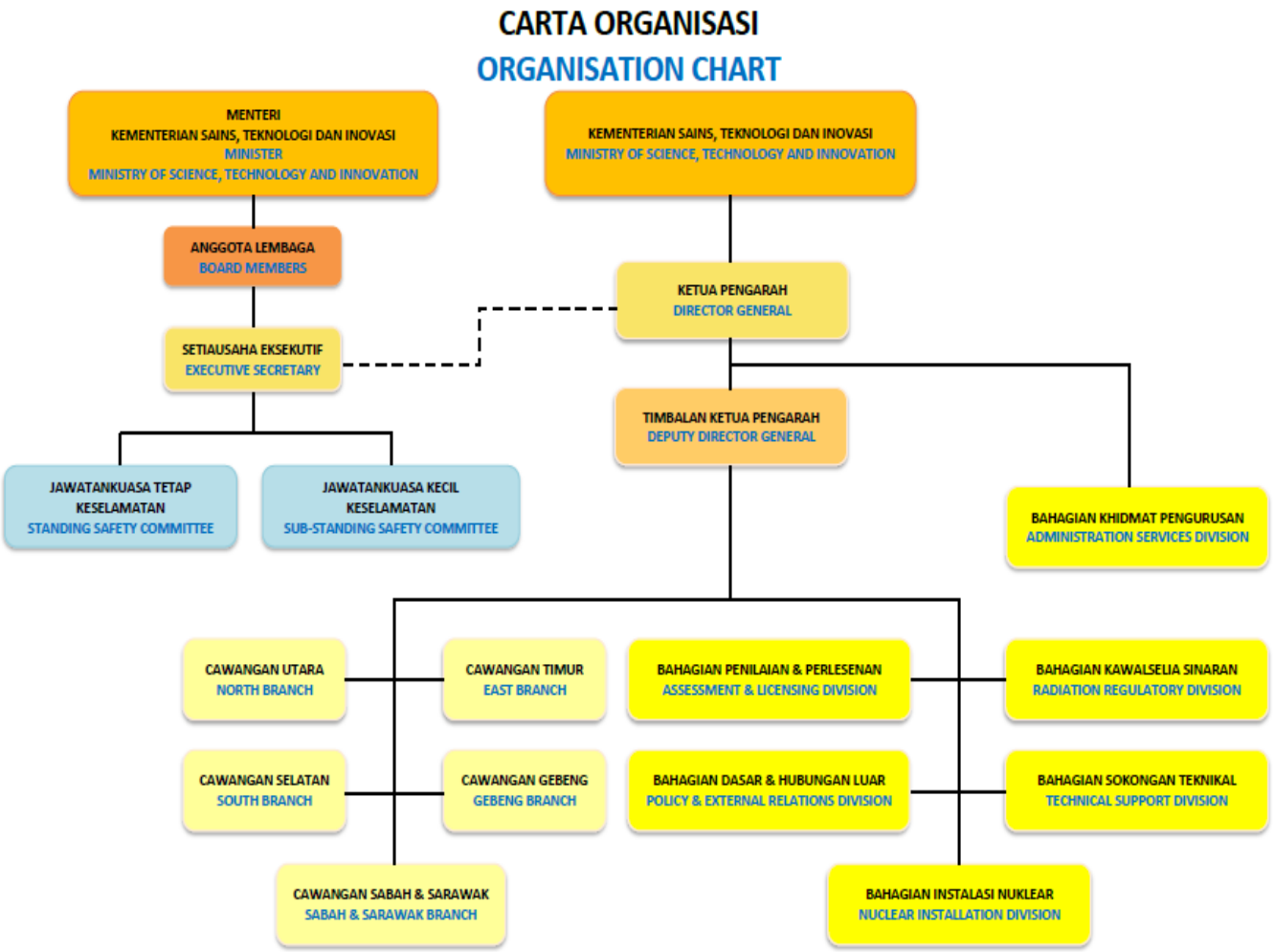
Dedahan Dos Tahunan (mSv) Annual Dose Exposure (mSv)		Radiografi Industri Industrial Radiography	Aktiviti-aktiviti Lain Other Activities	Jumlah Pekerja Sinaran (PS) Total of Radiation Workers (RW)
0.0		**0**	**0**	**10462**
0.1 – 5.0		**97.24**	**55.19**	**173**
5.1 – 18.0		**735.70**	**73.10**	**351**
18.0 – 20.0		**1563.54**	**84.69**	**167**
20.1 – 29.9		**501.79**	**26.93**	**22**
30.0 – 49.9		**89.67**	**0**	**2**
>50.1		**120.53**	**0**	**2**
Jumlah PS / Total of RW		**1347**	**9832**	**11179**
Jumlah Dos / Total of Dose		**3108.50**	**239.91**	**3348.40**
Purata Dedahan Dos (mSv/orang) Average of Dose Exposure (mSv/person)	**Tahun / Year**			**Purata / Average**
	2006	4.19 mSv	0.24 mSv	0.68 mSv
	2007	4.38 mSv	0.13 mSv	0.69 mSv
	2008	4.99 mSv	0.59 mSv	1.09 mSv
	2009	6.04 mSv	0.07 mSv	0.84 mSv
	2010	6.73 mSv	0.23 mSv	0.66 mSv
	2011	4.24 mSv	0.15 mSv	0.68 mSv
	2012	2.98 mSv	0.06 mSv	0.53 mSv
	2013	4.02 mSv	0.07 mSv	0.61 mSv
	2014	**2.31 mSv**	**0.02 mSv**	**0.30 mSv**

Pada tahun 2014, pekerja sinaran seramai 11179 yang merangkumi 1347 pekerja sinaran dalam radiografi industri dan 9832 dalam aktiviti-aktiviti yang lain. Purata dedahan dos (mSv/orang) adalah 0.30 mSv. Radiografi industri mencatatkan bacaan 2.31 mSv dan aktiviti lain adalah 0.02 mSv.

In 2014, radiation wokers of 11179 consist of 1347 workers in industrial radiografi and 9832 workers in other activities. The average exposure dose (mSv/person) is 0.30 mSv. Industrial radiografi recorded a reading of 2.31 mSv and other activities were recorded 0.02 mSv.

APPENDIKS / APPENDIX

CARTA ORGANISASI / ORGANISATION CHART



PELAN TINDAKAN STRATEGIK 2011-2015

Di bawah Pelan Malaysia ke-10, lima bidang Keberhasilan utama telah dikenalpasti sebagai mampu laksana dari AELB.

Ini adalah seperti yang berikut:

- Perundangan dan struktur urus tadbir untuk radiasi dan keselamatan nuklear, perlindunganserta pengawalan
- Pengawalan dan penyeliaan
- Kerjasama nasional dan antarabangsa
- Pembangunan sumber manusia
- Pengurusan pengetahuan

Selaras dengan lima (5) bidang keberhasilan utama AELB telah menubuhkan enam pelan tindakan strategik bagi tempoh 2011-2015. Pelaksanaan pelan tindakan ini melibatkan peringkat yang berbeza-beza. Banyak yang telah dilaksanakan, walaupun masih ada yang perlu dibaiki untuk tujuan penambahbaikan.

AELB akan terus menguatkan integrasi dalaman dan luaran dengan rakan kongsi yang terdiri daripada pihak kerajaan dan juga swasta dari dalam Negara dan juga antarabangsa. Justeru itu, bagi memenuhi proses ini, AELB akan memastikan strategi, kekuatan, Standard operasi penyelesaian menjadi berguna dalam menangani tuntutan sektor teknologi nuklear di masa sekarang dan juga masa hadapan.

ST1

Meningkatkan pembangunan perundangan serta rangka kerajaan untuk keselamatan radiasi dan nuklear, perlindungan dan kawalselia termasuk penubuhan badan pengawalselia bebas yang efektif.

Pelan Tindakan

Penubuhan rangka perundangan dan urus tadbir untuk keselamatn radiasi dan nuklear, yang dinilai secara berjadual dan dinilai untuk memastikan keberkesanannya. AELB akan terus menyumbangkan kepakaran, professional serta pandangan serta cadangan yang adil dan tidak berat sebelah bagi memastikan objektif tercapai sepenuhnya.

ST2

Membangunkan kerjasama dan penglibatan yang aktif diperingkat nasional dan juga antarabangsa di dalam isu teknikal juga polisi keselamatan, perlindungan dan pengawalseliaan radiasi yang efektif.

Pelan Tindakan

Bahagian Komunikasi dan Multimedia

- Memperkasakan program kesedaran awam
- *Menambahbaik pengisian di dalam Galeri Kesedaran Awam*
- *Mengatur dan mengkaji penyebaran menerusi media siber*

Bahagian Sokongan Teknikal

- *Menyelaraskan pelaksanaan aktiviti kajian pengawalseliaan*
- *Mengawasi pembangunan kajian pengawalseliaan.*

ST3

Meningkatkan mekanisme kawalan terhadap patuh-kawal selia serta kepuasan pelanggan.

Pelan Tindakan

Bahagian Sokongan Teknikal

- *Mengenalpasti dan menguruskan pembelian peralatan saintifik*
- *Meningkatkan pengetahuan pekerja tentang analisis sampel*
- *Menganalisa serta mengesahkan sampel alam sekitar di makmal AELB*

Bahagian Perlesenan

- *Menaiktaraf serta menambahbaik sistem eLesen serta membantu proses lesen di dalam talian serta pentauliahan permohonan, dan mengulas semula segala dokumen berkaitan yang dihantar oleh pemohon.*
- *Membangunkan dokumen garis panduan bagi penilaian Impak Radiologi dan Pelan pengurusan Sisa / bahan buangan Radioaktif.*
- *Mengkaji Piagam Pelanggan yang baru yang berkaitan dengan proses perlesenan.*

Bahagian Penguatkuasaan

- *Menubuhkan fasiliti penyimpanan di tiga cawangan AELB untuk pengurusan eksibit yang lebih efektif*
- *Memudahkan dan memastikan keberkesanan proses penguatkuasaan*

ST4

Meningkatkan keberkesanan di dalam penyediaan tindak balas terhadap segala kemungkinan kecemasan nuklear dan radiasi.

Pelan Tindakan

- *Memastikan semua peralatan dikoloborasi dan kekal dalam keadaan yang baik*
- *Memastikan kebolehsediaan bekalan simpanan makmal setiap masa.*
- *Memastikan dan menjaga Environmental Radiation Monitoring System (ERMS) di setiap negeri.*

Bahagian Penguatkuasaan

- *Memastikan semua prosedur-prosedur diikuti dan dipatuhi sebagai rujukan untuk pengurusan kemungkinan kecemasan.*
- *Memastikan tindakan yang seragam di peringkat nasional.*
- *Membangunkan dan menubuhkan prosedur prosedur berkaitan / dokumen panduan untuk tindakan tindak balas serta penyediaan semasa kecemasan (ERP)*
- *Membeli dan menambahbaik infrastruktur kecemasan, kemudahan, peralatan dan sistem.*

ST5

Membangunkan kapasiti dan kebolehan infrastruktur AELB dan sumber manusia.

Pelan Tindakan

Bahagian Komunikasi dan Multimedia

- *Mengkaji semula Pelan Strategi Teknologi Informasi dan Komunikasi (ICT) bersesuaian dengan Pelan Strategik AELB*
- *Memastikan polisi keselamatan AELB ICT bertepatan dengan MAMPU dan MOST*
- *Menyediakan kemudahan tele video-konferen untuk pekerja*
- *Menyediakan infrastruktur internet dan bantuan teknikal bagi ERMS dan RPM*

Bahagian Perlesenan

- *Menubuhkan unit baru untuk pengesahan serta kelulusan permit di bawah sistem e-Permit-STA*

- *Menubuhkan pengendalian sistematik bagi pembangunan sumber manusia termasuk perlindungan, ciri-ciri keselamatan, NORM dan proses Mineral, pelesenan NPP, serta penilaian keselamatan.*

Bahagian Penguatkuasaan

Menyediakan dan mengadakan program latihan bagi memastikan semua aktiviti pemeriksaan adalah relevan dan patuh amalan antarabangsa.

Bahagian Sokongan Teknikal

Mengintegrasi perisian yang baru dengan sistem sedia ada untuk mengesan sebarang kehadiran pencemaran dan pemerdagangan bahan nuklear dan radioaktif.

ST6

Melindungi hak-hak mutlak pembangunan keselamatan teknologi nuklear dan bertujuan untuk keselamatan dan keamanan di Malaysia serta menggalakkan keyakinan awam terhadap penggunaan teknologi secara aman.

Pelan Tindakan

Keseluruhan pelan tindakan AELB adalah termasuk:

- *Meneruskan penilaian kemampuan teknikal*
- *Membantu agensi-agensi penguatkuasaan berkaitan di dalam mengesan tahap pencemaran serta pemerdagangan haram nuklear dan bahan-bahan radioaktif.*
- *Meneruskan usaha meratifikasi Protokol Tambahan terhadap perjanjian*
- *kawalan komprehensif dengan IAEA*

STRATEGIC ACTIONS PLAN 2011-2015

Under the 10th Malaysia Plan, five key Result Areas (KRAs) have been identified as deliverables from AELB.
These are:

- Legal and governmental structure for radiation and nuclear safety, security and safeguards
- Control and supervision
- National and international co-operation
- Human capital development
- Knowledge management

In accordance with the five KRAs AELB has established six strategic action plans for the period 2011-2015. Implementation of these action plans is at different stages of progress. Many have been accomplished though there are areas where improvement can and will be made.

AELB will continue to strengthen integration internally and externally with other partners in the public and private sector locally and internationally. In the process, AELB will ensure that its strategies, strengths, operational solutions and standards stand it in good stead in addressing current and future demands in the nuclear technology sector.

ST1
To enhance the development of an effective legal and governmental framework for radiation and nuclear safety, security and safeguards including the establishment of an independent regulatory body.

Action Plan
The legal and governmental framework has been established with periodic assessment and review to ensure its effectiveness. AELB will continue to provide its expert, professional and impartial views and recommendations to ensure the objective is fully achieved.

ST2
To develop effective co-operation and active participation at national and international level in technical and policy issues of radiation and nuclear safety, security and safeguards.

Action Plan
Communication and Multimedia Section

- *To intensify public awareness programmes*
- *To improve the contents of the Public Awareness Gallery*
- *To collate and study information disseminated through the cyber media*

Technical Support Division

- *To co-ordinate the implementation of regulatory research activities*
- *To monitor the development of regulatory research*

ST3
To enhance the supervision mechanism over licensee's compliance with regulatory requirements and customer satisfaction.

Action Plan
Technical Support Division

- *To identify and manage the purchase of scientific equipment*
- *To enhance staff's knowledge of sample analysis*
- *To analyse and verify environmental samples at AELB laboratories*

Licensing Division

- *To upgrade and improve the eLesen system and facilitate the online license process and authorisation application, and reviewing related supporting documents submitted by applicants.*
- *To develop new guidance documents for Radiological Impact Assessment and Radioactive Waste Management Plan.*
- *To study the revision of the Client Charter related to the licensing process.*

Enforcement Division

- *To establish storage facilities at three AELB branches for effective management of exhibits*
- *To simplify and ensure the effectiveness of the enforcement process*

ST4

To enhance effectiveness in emergency preparedness and response for nuclear and radiation contingencies.

Action Plan

Technical Support Division

- *To ensure all equipment are calibrated and remain in good condition*
- *To ensure ready availability of laboratory supplies at all times*
- *To install and maintain the Environmental Radiation Monitoring System (ERMS) in each state*

Enforcement Division

- *To establish procedures that will serve as a reference for the management of radiological contingencies*
- *To ensure the standardization of actions at national level*

ST5

To build the capacity and capability of AELB's infrastructure and human capital.

Action Plan

Communication and Multimedia Section

- *To review the Information and Communication Technology (ICT) Strategy Plan in line with AELB's Strategic Plan*
- *To ensure that AELB's ICT safety policy is in line with that of MAMPU and MOSTI*
- *To provide video conferencing facility for staff*
- *To provide an internet infrastructure and technical assistance for ERMS and RPM*

Licensing Division

- *To establish a new unit to verify and approve permits under the e-Permit-STA system*
- *To establish systematic arrangements for human resource development including security and safeguards features, NORM and mineral processing, NPP licensing and safety assessment*

Enforcement Division

To conduct training programmes to ensure that all inspection activities are relevant and in compliance with international practices

Technical Support Division

To integrate the new system software with the existing system to detect contamination and illicit trafficking of nuclear and radioactive materials.

ST6

To protect the inalienable right to develop nuclear technology safely and securely for peaceful purposes in Malaysia and to foster public confidence in the peaceful use of nuclear technology.

Action Plan

AELB's overall plans include:

- *To continue with technical competency evaluation*
- *To assist other enforcement agencies in detecting pollution level and illicit trafficking of nuclear and radioactive materials*
- *To continue with ratification of the protocol additional to the comprehensive safeguard agreement with IAEA*