Mengawasi Keselamatan, Masyarakat Terpelihara
Advocating Safety, For A Secured Community

2013
Laporan Tahunan
Annual Report

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

AELB
ATOMIC ENERGY LICENSING BOARD

VISI AELB

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

MISI AELB

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

KEUTAMAAN KAMI

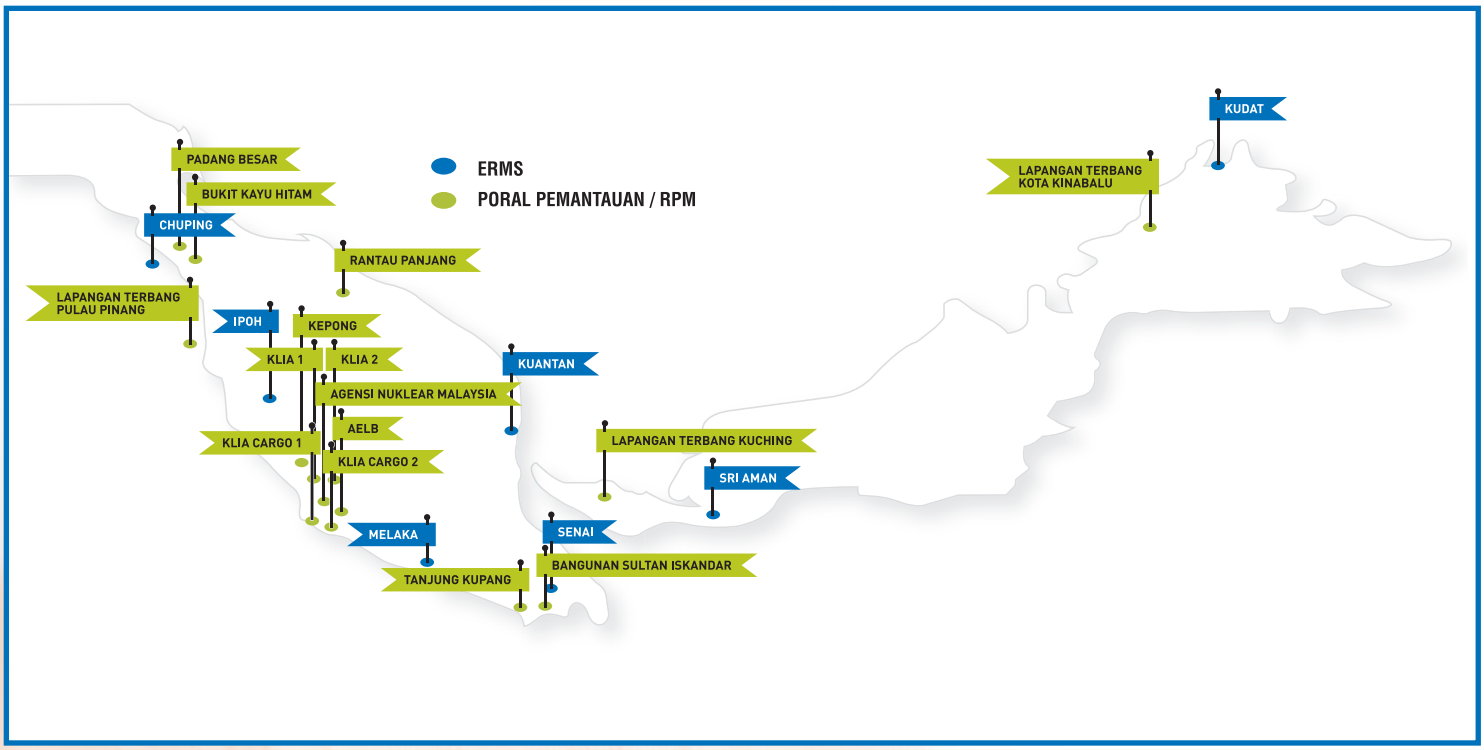
MENGAWASI KESELAMATAN, MASYARAKAT TERPELIHARA

Selari dengan misi ini, AELB mengamalkan pendekatan perkongsian dinamik serta inovatif di dalam sistem pengurusan radiasi dan teknologi nuklear bagi memastikan keselamatan lestari bangsa serta keselamatan komuniti menyeluruh.

Untuk mencapai objektif ini, AELB menekankan kepentingan perkongsian dengan rakan kongsi antarabangsa serta nasional. Ini amat penting untuk memastikan keselamatan, perlindungan, keamanan dan penggunaan teknologi nuklear berterusan demi untuk pembangunan ekonomi yang lestari.

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 PEMANTAUN

Pejabat Cawangan AELB

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

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 4300
Faks: 07-663 2409

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

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

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

KANDUNGAN

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.

SISTEM PERUNDANGAN DAN PERATURAN-PERATURAN YANG MENGURUS TADBIR AELB

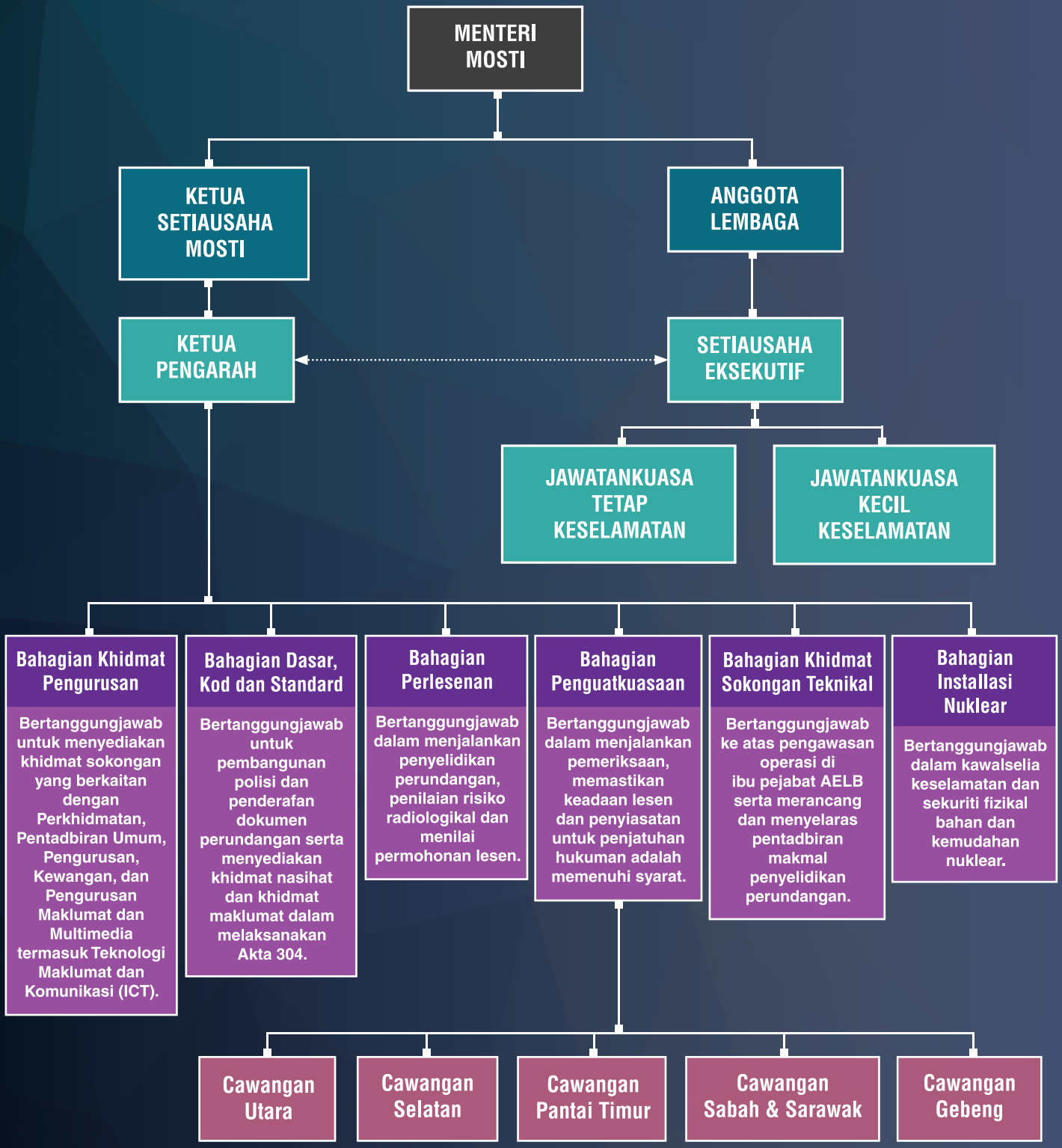
AKTA PERLESENAN TENAGA ATOM 1984 (ACT 304)

- Menyediakan peruntukan mengenai kawalseliaan dan kawalan tenaga atom.
- Menyediakan penetapan standard-standard mengenai liabiliti terhadap kerosakan nuklear.
- Menyediakan perkara-perkara yang berkaitan atau berhubungan dengannya.

BADAN KAWALSELIA

- AELB telah ditubuhkan dibawah Lembaga Perlesenan Perlesenan Tenaga Atom dibawah seksyen 3, Akta 304.
- Memastikan keselamatan, perlindungan, mengawal dan mengawasi pengeluaran, pernakaian dan penggunaan tenaga atom dan perkara-perkara yang bersampingan dengannya.

CARTA ORGANISASI



PENARAJU AELB

Ahli Lembaga AELB

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

Ahli-ahli Lembaga

1 Y. Bhg. Prof. Datin Paduka Dr. Khatijah bt. Mohd Yusoff
Timbalan Ketua Setiausaha - Sains
Kementerian Sains, Teknologi dan Inovasi
(sehingga 31 Oktober 2013)

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

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

4 Y. Bhg. Datuk Ir. Ahmad Fauzi b. Hasan
Ketua Pegawai Eksekutif
Suruhanjaya Tenaga

Setiausaha Eksekutif
Y.M. Raja Dato' Abdul Aziz b. Raja Adnan
Ketua Pengarah
Lembaga Perlesenan Tenaga Atom
Kementerian Sains, Teknologi dan Inovasi

PENGURUSAN TERTINGGI AELB

PEJABAT KETUA PENGARAH
Y.M. Raja Dato' Abdul Aziz b. Raja Adnan
Ketua Pengarah

Dr. Noor Hasnah bt. Mohamed Khairullah
Penasihat Khas

Saidatul Akmar bt. Suberi
Penasihat Undang-undang
(sehingga 20 November 2013)

BAHAGIAN KHIDMAT PENGURUSAN
Danny Al Jeffery b. Abdullah
Pengarah

BAHAGIAN DASAR, KOD & STANDARD
Pengarah - Ditanggung oleh: Monalija bt. Kostor

BAHAGIAN PERLESENAN
Hasmadi b. Hassan
Pengarah

BAHAGIAN INSTALLASI NUKLEAR
Mohd Pauzi b. Mohd Sobari
Pengarah

BAHAGIAN PENGUATKUASAAN
Hamrah b. Mohd Ali
Pengarah

BAHAGIAN SOKONGAN TEKNIKAL
Mohd Yasin b. Hj. Sudin
Pengarah

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.

LAPORAN OPERASI

PERKEMBANGAN BERKAITAN DENGAN KESELAMATAN BAHAN NUKLEAR DI MALAYSIA

- **Menyokong Perjanjian Multilateral**
  Malaysia kini berada di dalam peringkat akhir menyemak semula Akta Pelesenan Tenaga Atom 1984 (Akta 304) yang mana akan mengabungkan peruntukan Agensi Tenaga Atom Antarabangsa (IAEA) dan Konvensyen Perlindungan Fizikal Bahan Nuklear (CPPNM) serta Protokol Pindaan 2005; Konvensyen Antarabangsa Bagi Membanteras Kegiatan Keganasan Nuklear (ICSANT) dan Protokol Tambahan Agensi Tenaga Atom Antarabangsa (IAEA) serta pelbagai peraturan yang ditetapkan oleh IAEA, Protokol Tambahan kepada Perjanjian Keselamatan Sejagat IAEA.

  Undang-Undang nuklear yang komprehensif ini membolehkan Malaysia menjadi ahli kepada pelbagai Konvensyen dan Protokol-Protokol Keselamatan Nuklear, termasuk akses kepada CPPNM, ratifikasi dari ICSANT, Protokol Tambahan IAEA serta mengadaptasi pelbagai Kod Etika IAEA.

- **Memperkasakan Sistem Sekuriti Bahan Nuklear dan Radiologi Kebangsaan.**
  Malaysia tekad meneruskan pelaksanaan Akta Perdagangan Strategik (STA) 2010 [Akta 708] yang digubal pada 1 Julai 2011. Akta ini bertujuan untuk mengawal eksport, transhipmen, transit dan pembrokeran barang strategik, termasuk senjata dan bahan yang berkaitan, serta aktiviti-aktiviti yang menyokong pembentukan, pembangunan, pengeluaran dan penghantaran senjata pemusnah besar-besaran, selaras dengan tanggungjawab ke atas keselamatan negara dan obligasi Malaysia di peringkat antarabangsa. Penggubalan STA melambangkan komitment Malaysia untuk melaksanakan UNSR 1540.

  Malaysia mengamalkan sistem Kawalan Bahan Nuklear untuk meningkatkan pengawasan serta pengawalan terhadap reaktor penyelidikan. AELB sedang bekerjasama rapat dengan Amerika Syarikat di dalam usaha menaiktaraf perlindungan fizikal untuk irradiator nuklear melalui program kerjasama Inisiatif Pengurangan Ancaman Global (GTRI). Terdapat empat Kemudahan Punca Radioaktif Kategori 1 di Malaysia yang telah menjalani proses penilaian pada Bulan Februari 2012, iaitu SINAGAMA, Gamma Green House, Gamma Cell dan Raymintex.

  Malaysia telah dijemput sebagai pakar di dalam program-program IAEA untuk berkongsi

pengetahuan serta amalan baik di dalam menangani keselamatan nuklear di peringkat nasional serta serantau bersama dengan peserta-peserta yang lain. Malaysia masih meneruskan langkah-langkah keselamatan yang telah dinyatakan di dalam Pelan Keselamatan Nuklear IAEA 2010-2013.

Malaysia juga telah melibatkan diri di dalam Projek Nasional IAEA yang dikenali sebagai NSF 11318-Deployment of Radiation Detection Equipment for Nuclear Security Applications untuk memperkasakan pembangunan sumber manusia di dalam keselamatan nuklear.

- **Sumbangan kepada IAEA di dalam aktiviti-aktiviti yang berkaitan dengan keselamatan Nuklear.**
  Malaysia komited di dalam melaksanakan IAEA Information Circular INFCIRC/225 - ke atas perlindungan fizikal di dalam kemudahan serta bahan nuklear.

  AELB telah melaksanakan ketetapan-ketetapan Kod Etika berdasarkan IAEA Code of Conduct on the Safety and Security of Radioactive Sources serta Supplementary Guidance on the Import and Export of Radioactive Sources. Program Kesedaran komprehensif terhadap cara pengurusan radioaktif di dalam Negara telah dijalankan untuk menambahbaik tahap kompetensi serta kebolehan mengurus bahan radioaktif ini dikalangan pengguna yang dibenarkan.

  Malaysia berusaha memastikan semua aktivit-aktiviti yang berkaitan dengan keselamatan mematuhi Standards Antarabangsa yang telah ditetapkan oleh IAEA. Malaysia telah menilai semula Pelan Integrasi Keselamatan Nuklear (INNSP) dan telah terbukti bahawa Pelan ini boleh dijadikan instrumen berguna di dalam mereka bentuk program keselamatan nuklear nasional yang lestari.

  Dengan bantuan IAEA, Malaysia telah pun membangunkan INSSP bagi tempoh 2009-2013 sebagai pelan komprehensif untuk menambahbaik sekuriti nuklear di dalam Negara. Bagi tujuan tersebut juga, Malaysia telah mengulas semula INSSP untuk tahun 2013-2015 dengan memasukkan cadangan-cadangan dari IAEA.

- **Sokongan terhadap Aktiviti-Aktiviti yang berkaitan dengan Keselamatan Nuklear Antarabangsa**
  Malaysia telah mengesahkan perlaksanaan terhadap Statement of Principles to the Global Initiative to Combat Nuclear Terrorism (GICNT). Pada 3 Jun 2013, Malaysia telah berdaftar dengan International Catalogue of Sealed Radioactive Sources and Devices (ICSRS). Ini membolehkan Malaysia untuk mengenal pasti punca serta bekas punca dan butir-butir pengeluar dan pembekal di seluruh dunia.

  Ketika ini Malaysia masih merundingkan kerjasama dengan Myanmar termasuk pertukaran dan perkongsian amalan baik serta pengalaman di dalam isu keselamatan nuklear.

- **Sumbangan terhadap mengurangkan Bahan-Bahan Nuklear Sensitif**
  Hampir 3000 punca bahan Radioaktif Tidak Terpakai Terkedap (DSRS) disimpan di dalam tempat penyimpanan sementara Agensi Nuklear Malaysia. Untuk memastikan kawal selia serta keselamatan DSRD, Malaysia, dengan bantuan IAEA, sedang membangunkan kemudahan pelupusan yang menggunakan teknologi "borehole" untuk menguruskan bahan tidak terpakai ini di dalam keadaan yang selamat dan terjamin.

  Di bawah Polisi Sains, Teknologi dan Inovasi Kebangsaan, Malaysia sedang mengkaji tentang keupayaan thorium sebagai punca jana tenaga yang menyumbang kepada penggerakan tenaga nuklear. Polisi ini dikenali sebagai program "Flagship" untuk menyokong pembangunan teknologi baru yang mampan. Salah satu dari fokus utama program tersebut adalah mengkaji kebolehan penggunaan *thorium* daripada sumber-sumber tempatan digunakan untuk program Tenaga Nuklear Malaysia.

- **Penubuhan Pusat Kecemerlangan dan Sokongan**
  Malaysia telah diiktiraf sebagai Pusat Sokongan Keselamatan Nuklear (NSSC) oleh IAEA sejak Disember 2012. Menerusi NSSC, Malaysia mampu untuk meningkatkan kepakaran

tempatan di dalam keselamatan nuklear. Selain dari itu, Malaysia berterusan meningkatkan penguatkuasaan Undang-Undang menerusi latihan Pengesanan dan Tindabalas Kecemasan oleh badan penguatkuasa Undang-undang di dalam keadaan atau kontingensi yang melibatkan nuklear atau punca radioaktif yang lain.

Sebagai sebuah NSSC serantau, Malaysia dengan kerjasama IAEA, telah menyebarkan amalan baik serta berkongsi pandangan serta pengalaman dengan Negara-negara serantau. Ini bertujuan memperkasakan lagi kepakaran nasional serta pada masa yang sama bertepatan dengan usaha berterusan di dalam membentuk pertukaran maklumat serta rangkaian perkongsian pengalaman yang luas. Sebagai sebuah badan NSSC, Malaysia telah dijemput ke program-program IAEA di peringkat nasional serta antarabngsa untuk berkongsi pendapat dan pengalaman.

Sebagai sebuah badan yang diiktiraf sebagai NSCC, Malaysia berterusan memperkasakan penguatkuasaan undang-undang dengan menubuhkan Integrated National Nuclear Security Training Module kepada pegawai-pegawai terlibat.

- **Meningkatkan Usaha membenteras Pemerdagangan Nuklear dan Bahan Radioaktif secara haram.**
  Pada 29 Mac 2001, Malaysia telah diberi akses kepada Illicit Trafficking Database in Nuclear Material and Other Radioactive Sources. Pangkalan data ini di bawah pengurusan World Custom Organisation (WCO) dan International Police Organisation (INTERPOL). Keupayaan keselamatan nuklear Malaysia telah ditambahbaik dengan adanya pangkalan data antarabangsa.

Malaysia berterusan memastikan penambahbaikan di dalam sistem pengesanan sinaran yang telah ditetapkan oleh IAEA's standard Integrated Nuclear Security Network (INSN). Ini membolehkan Kastam Diraja Malaysia mengesan radiasi dari jauh di pintu masuk dan pintu keluar Negara. Malaysia telah mempunyai mekanisme pengesanan Pemeriksaan radiasi ketika majlis-majlis rasmi. Ini telah ditunjukkan semasa Global Entrepreneur Partnership Summit 2013 yang dianjurkan di Kuala Lumpur. Mekanisme penguatkuasaan di dalam pengesanan radiasi akan dilanjutkan untuk penambahbaikan di masa hadapan.

- **Memperkasakan Hubungan di antara Kerajaan dan Industri Nuklear**
  Pada Ogos 2013, AELB telah diberi mandat oleh Jawatankuasa Pelan Operasi Nasional Malaysia untuk mengetuai agensi Sokongan Teknikal di dalam melaksanakan langkah-langkah keselamatan nuklear di Malaysia.

Penggalakkan budaya industri nuklear selamat amat dititikberatkan. AELB telah menjalankan serta menyertai pelbagai program pembangunan sumber manusia yang berkaitan dengan keselamatan nuklear di peringkat nasional mahupun antarabangsa.

LAIN- LAIN PERKARA PENTING DALAM TAHUN 2013

- **Bengkel Penilaian Keselamatan oleh AELB-KINS ke atas Projek Penambahbaikan Reactor Digital Instrumentation and Control System (ReDICS).**
  Pada 6 hingga 8 Februari 2013, beberapa pegawai dari AELB dan Agensi Nuklear Malaysia telah menghadiri bengkel penilaian keselamatan ReDICS yang dianjurkan oleh Korea Institute of Nuclear Safety (KINS) di Daejeon, Korea.

  Antara objektif bengkel ini adalah untuk membentangkan kajian teknikal dan penilaian AELB terhadap perlaksanaan pengubahsuaian ReDICS yang menggantikan sistem analog sedia ada. Kajian teknikal dan penilaian ini telah dilakukan selaras dengan keperluan keselamatan IAEA dan standard keselamatan AELB LEM/ TEK/53, serta mengambilkira cadangan dan amalan baik KINS.

  Kajian teknikal dan penilaian AELB ini beserta penemuannya telah didokumentasikan di dalam Laporan Awal Penilaian Keselamatan (SER) yang turut dibincangkan semasa bengkel ini berlangsung. Laporan Akhir SER ini telah digunapakai sebagai asas proses membuat keputusan peraturan AELB, sebelum sebarang kelulusan pembinaan fasiliti nuklear boleh dikeluarkan.

  Terdapat juga satu majlis pertukaran Rekod Perbincangan (ROD) di dalam Bengkel Penilaian Keselamatan AELB-KINS terhadap projek ReDICS ini. Majlis pertukaran ROD ini telah disempurnakan oleh En Sang-Yun Kim, Pengarah Bahagian Kajian dan Polisi, selaku wakil KINS, dan En Mohd Pauzi Mohd Sobari, Pengarah Bahagian Instalasi Nuklear selaku wakil AELB.

  ROD ini telah disediakan semasa Mesyuarat Persediaan Projek ReDICS AELB-KINS yang diadakan di AELB pada 14 dan 15 Ogos 2012, merangkumi semua aktiviti-aktiviti yang telah dipersetujui untuk dilaksanakan dengan bantuan pakar-pakar dari KINS bagi memastikan kejayaan penilaian peraturan yang komprehensif terhadap perlaksanaan projek menaiktaraf ReDICS.

- **Bengkel Membangunkan Kapasiti Kebangsaan di dalam Tidakbalas Kecemasan Nuklear atau Radiologi di Afghanistan.**
  AELB telah diberi kepercayaan untuk menjadi tuan rumah kepada Bengkel Membangunkan Kapasiti Kebangsaan di dalam Tindakbalas Kecemasan Nuklear atau Radiologi di Republik Islam Afghanistan.

  Bengkel yang diadakan dengan kerjasama IAEA pada 18 hingga 22 Mac 2013 ini bermatlamat membangunkan keupayaan dan kepakaran dikalangan badan-badan berkaitan di Afghanistan di dalam tindakbalas terhadap kecemasan nuklear dan radiologi. Sepuluh orang perwakilan dari deligasi Afghanistan telah menghadiri bengkel ini.

  Peserta Malaysia dari agensi-agensi yang berkaitan, termasuklah wakil-wakil dari Agensi Nuklear Malaysia, Jabatan Bomba dan Penyelamat Malaysia, Angkatan Tentera Malaysia, wakil Kementerian Kesihatan Malaysia dan kakitangan AELB telah dijemput oleh IAEA untuk turut serta mengambil bahagian didalam bengkel ini.

- **AELB-KINS Audit Jaminan Kualiti terhadap Projek Menaik Taraf ReDICS.**
  Wakil-wakil dari AELB, Agensi Nuklear Malaysia, Korea Nuclear Technology (KNT) serta pakar-pakar dari Korea Atomic Energy Research Institute (KEARI) dan Korea Institute of Nuclear Safety (KINS) telah mengambil bahagian di dalam proses audit jaminan kualiti terhadap Reactor Digital Instrumentation and Control System (ReDICS) di Daejeon, Korea pada 1 hingga 5 April 2013.

  Objektif audit ini dijalankan adalah bagi memastikan bahawa komponen dan sistem yang dibekalkan adalah mematuhi keperluan Akta 304 serta peraturan-peraturan sunsidiarinya.

  Audit ini telah dijalankan berdasarkan manual jaminan kualiti dan prosedur yang ditetapkan. Elemen penting yang turut diambil kira semasa pemeriksaan audit ini dilakukan adalah fabrikasi, struktur peringkat mereka bentuk, sistem dan komponen ReDICS untuk memastikan bahawa kualiti pengubahsuaian adalah mengikut spesifikasi teknikal yang telah ditetapkan.

  Terdapat beberapa cadangan telah diutarakan semasa mesyuarat penutup audit jaminan kualiti ReDICS ini bagi penambahbaikan pada masa akan datang. Majlis yang berlangsung selama lima hari ini turut memuatkan acara lawatan ke KNT, KEARI dan Syarikat RTP untuk pendedahan secara langsung kepada wakil-wakil Malaysia mengenai audit jaminan kuali ini.

- **Bengkel Serantau Mengenai Demonstrasi Keselamatan Kemudahan Pelupusan Sisa Radioaktif.**
  AELB telah diberi mandat oleh IAEA dan

Asian Nuclear Safety Network (ANSN) untuk menganjurkan bengkel serantau mengenai demonstrasi keselamatan kemudahan pelupusan sisa radioaktif.

Dua belas peserta dari Korea Selatan, Bangladesh, Thailand, Filipina, Vietnam, Indonesia dan Malaysia telah menghadiri bengkel yang diadakan di Ibu Pejabat AELB pada 17 hingga 21 Jun 2013. Wakil-wakil dari lain-lain agensi seperti Agensi Nuklear Malaysia, Kementerian Kesihatan Malaysia dan Malaysia Nuclear Power Corporation (MNPC) turut serta menghadiri bengkel ini selaku pemerhati luar.

Tujuan bengkel ini diadakan adalah untuk membina dan memperkukuhkan kapasiti di dalam pembangunan dan demonstrasi kemudahan pelupusan sisa radioaktif secara selamat serta memberi tumpuan kepada pembangunan penilaian keselamatan oleh pengendali dan pandangan serta ulasan oleh badan penguatkuasa.

Peserta bengkel dan pemerhati juga telah diberikan latihan yang bertujuan meningkatkan pemahaman ke atas ceramah yang telah diberikan. Para peserta juga telah membuat pembentengan mengenai status terkini Negara masing- masing mengenai pengalaman dan pendekatan Negara mereka di dalam menunjukkan keselamatan kemudahan pelupusan sisa radioaktif di Negara mereka.

- **Mesyuarat Kali Ke-2 Kajian Teknikal ke atas Projek Compass-M: Gunapakai PSA terhadap Kemudahan Sedia Ada untuk Pembangunan Kemahiran Boleh Pindah-Milik di dalam Penggunaan PSA untuk Menilai Keselamatan NPP.**

  Mesyuarat ini adalah hasil anjuran bersama IAEA dan AELB yang diadakan di Ibu Pejabat AELB pada 3 hingga 7 Jun 2013. Selain daripada pegawai-pegawai AELB, mesyuarat ini juga telah dihadiri oleh ahli-ahli jawatankuasa projek dari Agensi Nuklear Malaysia dan pakar-pakar IAEA.

  Mesyuarat ini bertujuan mengkaji semula dan membincangkan skop PSA yang akan dilaksanakan di dalam projek ini serta perkembangan Projek COMPASS-M dari segi tugas, syarat-syarat, tanggungjawab dan isu-isu berkaitan.

  Projek ini memerlukan kerjasama di antara pakar-pakar dari badan penguatkuasa, organisasi penyelidikan nuklear dan universiti-universiti tempatan untuk mewujudkan kecekapan dan kebolehsaingan dikalangan pakar-pakar di Malaysia di dalam Kebarangkalian Penilaian Keselamatan (PSA) loji tenaga nuklear.

  Fokus utama projek ini adalah untuk menguasai teknologi PSA di dalam penilaian keselamatan loji tenaga nuklear melalui aplikasi secara praktikal berdasarkan Standard Keselamatan IAEA yang berkaitan, dalam usaha membangunkan satu model PSA untuk reaktor penyelidikan di Malaysia.

  Model PSA ini bertujuan untuk melaksanakan analisis terperinci mengenai turutan kemalangan dominan yang dikenalpasti serta menghasilkan laporan daripada hasil analisis tersebut.

- **Bengkel Serantau mengenai Kepentingan Pemahaman dan Pengetahuan di dalam Penyediaan Laporan Penilaian Tapak untuk Pembinaan Loji Tenaga Nuklear.**

  AELB dengan kerjasama Asian Nuclear Safety Network (ANSN) dan IAEA telah menganjurkan Bengkel Serantau mengenai Kepentingan Pemahaman dan Pengetahuan di dalam Penyediaan Laporan Penilaian Tapak pada 26 hingga 30, 2013 bertempat di Kuala Lumpur.

  Selain daripada penyertaan dari Malaysia, kira-kira tiga puluh (30) peserta lain dari lima (5) buah Negara iaitu Bangladesh, Thailand, Vietnam, Filipina dan Indonesia serta lima (5) pakar IAEA telah menghadiri bengkel ini.

  Bengkel ini memperkenalkan peserta kepada keperluan keselamatan IAEA dalam penyediaan laporan penilaian tapak yang merupakan salah satu dokumen sokongan utama yang diperlukan semasa memohon lesen tapak. Kajian kes dari negara-negara lain juga telah disampaikan oleh pakar-pakar dari Austria, India dan Turki.

  Peserta membincangkan pelbagai isu-isu yang berkaitan dengan penilaian tapak untuk pemasangan kemudahan nuklear, bahaya seismologi dan hidrologi, aplikasi sistem pengurusan untuk penilaian tapak, meteorologi, penyebaran radiologi dan kemungkinan rancangan kecemasan. Para peserta turut menyampaikan status pembangunan projek loji tenaga nuklear negara masing-masing yang berkaitan dengan aktiviti penilaian tapak dan juga isu-isu tertentu yang perlu dititikberatkan untuk mendapatkan permit kelulusan tapak.

  Bengkel ini menjadi landasan bagi pengendali loji tenaga nuklear Negara pada masa hadapan dan AELB selaku badan penguatkuasa untuk mengenal pasti keupayaan teknikal dan kemahiran yang diperlukan untuk menjalankan

aktiviti penilaian tapak. Ianya juga dapat membantu AELB untuk menilai Laporan Penilaian Tapak dan dokumen sokongan lain semasa proses perlesenan loji tenaga nuklear.

Wakil IAEA Encik H. Mahmood telah menyuarakan penghargaannya kepada Malaysia kerana telah menjadi rakan kongsi rapat dalam menggalakkan penggunaan piawaian IAEA secara global dan harmoni dan penerimaan amalan antarabangsa untuk memastikan operasi yang selamat bagi pemasangan nuklear, terutamanya di peringkat penilaian tapak.

- **Kursus Latihan Antarabangsa mengenai Langkah-Langkah Pencegahan dan Perlindungan terhadap Ancaman Dalaman di Kemudahan Nuklear.**

AELB telah menjadi tuan rumah kepada lebih daripada tiga puluh (30) wakil-wakil dari negara-negara yang telah memiliki pemasangan nuklear (termasuk reaktor penyelidikan) dan negara-negara yang ingin memulakan pemasangan nuklear dalam Kursus Latihan Antarabangsa mengenai Langkah-langkah Pencegahan dan Perlindungan Terhadap Ancaman Dalaman di Kemudahan Nuklear dari 30 September hingga 4 Oktober di Kuala Lumpur.

Bengkel lima hari bertujuan memperkenalkan kepada para peserta mengenai langkah-langkah keselamatan nuklear yang berkaitan dengan ancaman dalaman seperti kecurian bahan nuklear dan sabotaj serta keselamatan siber di kemudahan nuklear.

Pakar-pakar IAEA menyentuh konsep asas prinsip-prinsip dan objektif keselamatan nuklear dan keperluan IAEA di dalam dokumen Keselamatan Nuklear Siri No.8 dengan penekanan kepada mengenal pasti dan mengkategorikan ancaman orang dalam. Pelbagai kajian kes yang berkaitan dengan kejadian kecurian dan sabotaj telah dibentangkan.

Hasil daripada pembentangan, satu konsep telah diperkenalkan yang menekankan penilaian langkah-langkah pencegahan dan perlindungan dan menerangkan bagaimana langkah-langkah ini hendaklah digunakan untuk meningkatkan keselamatan terhadap ancaman dalaman.

- **Bengkel Pemeriksaan Pra-Operasi Projek Redics.**

Kelangsungan daripada beberapa siri aktiviti penguatkuasaan yang dijalankan di bawah kerjasama AELB-KINS terhadap projek Reactor Digital Instrumentation and Control (ReDICS), satu bengkel Pemeriksaan Pra-Operasi untuk ReDICS telah diadakan pada 23 hingga 27 September 2013 bertempat di Ibu Pejabat AELB. Objektif bengkel ini adalah untuk meningkatkan kefahaman konsep asas pentauliahan aktiviti sistem, struktur dan komponen dengan fokus kepada instrumentasi dan kawalan sistem digital.

Peserta bengkel telah dibawa melawat Agensi Nuklear Malaysia di mana mereka telah mendapat tunjuk ajar dari pakar-pakar KINS dalam melaksanakan pemeriksaan pra-operasi terhadap sistem Redics tersebut.

Didalam bengkel ini, Keperluan Keselamatan IAEA NS-R-4 Keselamatan Reaktor Penyelidikan dan amalan KINS telah digunakan sebagai asas untuk penyediaan dan pelaksanaan peringkat pentauliahan pemeriksaan pra-operasi. Ini adalah satu proses yang penting bagi memastikan pelaksanaan projek menaik taraf ini adalah selaras dengan undang-undang negara, keperluan keselamatan IAEA dan lain-lain amalan yang diterima di peringkat antarabangsa.

- **Bengkel Kebangsaan Penilaian Kendiri IAEA untuk Integrated Review of Infrastructure for Safety (IRIS) berdasarkan Specific Safety Guide No. 16 (Mewujudkan Infrastruktur Keselamatan untuk Program Tenaga Nuklear)**

AELB bersama dengan Malaysia Nuclear Power Corporation (MNPC) mengadakan bengkel kebangsaan mengenai Integrated Review of Infrastructure for Safety (IRIS) pada 16 hingga 18 Disember di Melaka.

Dua pakar IAEA, Cik Maren-Scarlett Ihlau dan Encik Nasir Mughal, dan kira-kira tiga puluh (30) peserta tempatan dari pelbagai agensi tempatan menghadiri bengkel ini. Bengkel ini bertujuan untuk memperkenalkan kepada peserta dengan cadangan IAEA dalam IAEA SSG-16 (Mewujudkan Infrastruktur Keselamatan untuk Program Tenaga Nuklear) yang menggariskan unsur-unsur penting yang perlu dipertimbangkan dalam membangunkan infrastruktur keselamatan yang berkesan dalam menyelia program tenaga nuklear di Malaysia pada masa hadapan.

Para peserta telah melakukan latihan penilaian kendiri dan penggunaan SARIS telah diperkenalkan. Berdasarkan kepada cadangan daripada SSG-16, negara ini perlu melaksanakan penilaian kendiri, di mana hasil utama penilaian tersebut adalah untuk mengenal pasti jurang dan amalan baik selaras dengan keperluan dan saranan Standard Keselamatan IAEA dan untuk membangunkan mempertingkatkan pelan tindakan untuk setiap jurang yang telah dikenal pasti.

LANGKAH SETERUSNYA

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, perlindungan serta 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*

Advocating Safety, For A Secured Community

2013
Annual Report

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

AELB
ATOMIC ENERGY LICENSING BOARD

THE AELB MISSION

To encourage a culture of innovation in order to ensure the safe and peaceful use of radiation and nuclear technology.

THE AELB VISION

To remain a relevant regulatory authority with credibility in radiation and nuclear safety, security and to safeguard its peaceful uses for national sustainable development.

OUR PRIORITIES

ADVOCATING SAFETY FOR A SECURE COMMUNITY

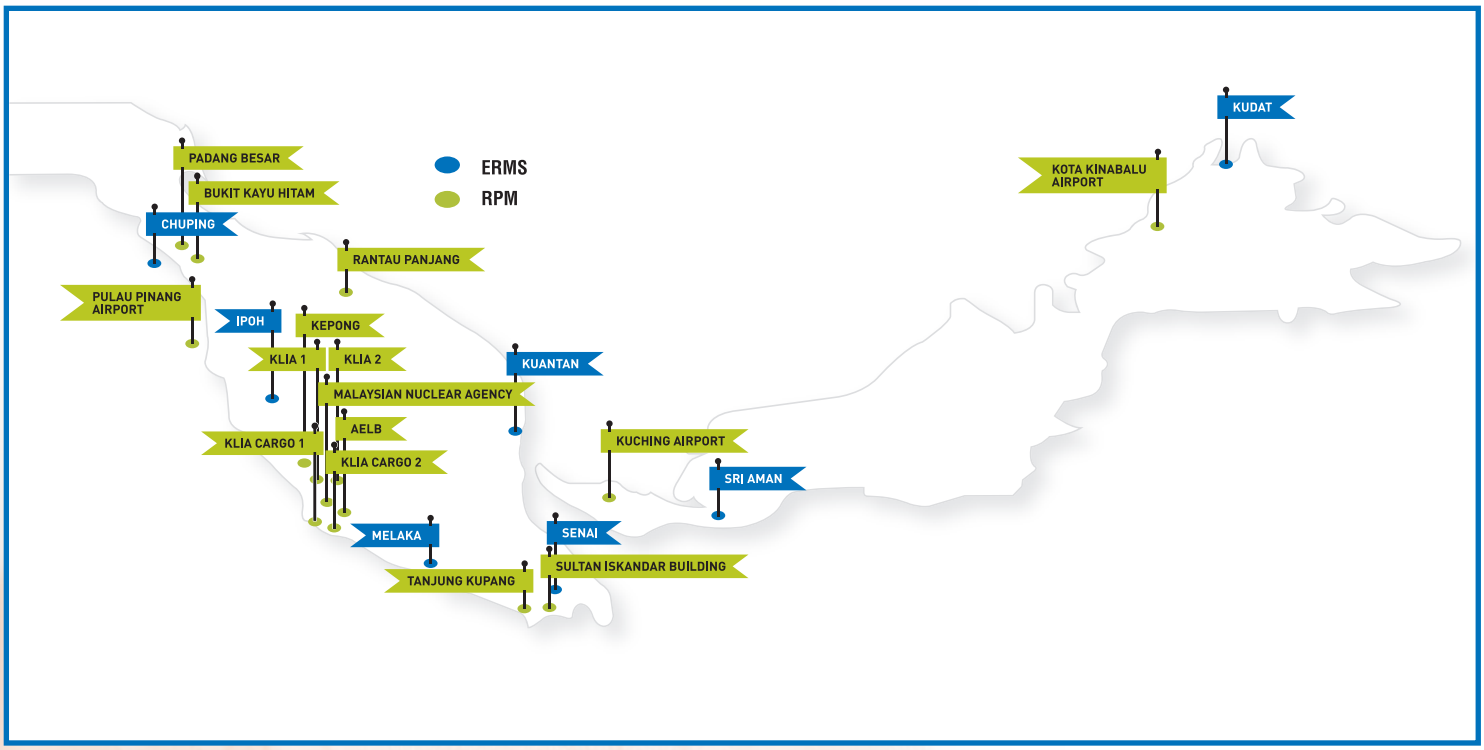
Safe energy for a secure community. That is the mission of AELB.

In line with this mission, AELB practises a dynamic and innovative approach in the management of radiation and nuclear technology to ensure safety for the nation and security for the community at large.

To achieve its objective, AELB emphasizes the vital importance of partnership with national and international partners in ensuring a safe, secure, peaceful and sustainable utilization of nuclear technology for economic progress.

OUR LOCATIONS

AELB's headquarters which is located in Dengkil, Selangor, is supported by five branch offices and seven monitoring stations in strategic locations throughout Malaysia. These branch offices and monitoring stations serve to assist AELB in performing its role to ensure security and safety in the use of nuclear technology. Radioactivity in the environment is monitored by the Environmental Radiological Monitoring System (ERMS). For national nuclear security purposes, a Radiation Monitoring Portal was installed at variouspoints of entry in the country to detect any radioactive materials.



CORPORATE INFORMATION

AELB Head Office

ATOMIC ENERGY LICENSING BOARD
Ministry of Science, Technology and Innovation
Batu 24, Jalan Dengkil
43800 Dengkil, Selangor, Malaysia

Tel: 603 - 8922 5888 Fax: 603 - 8922 3685
Website: www.aelb.gov.my

BRANCH OFFICES AND MONITORING STATIONS

AELB Branch Offices

NORTHERN ZONE (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 Pinang
Tel: 04-539 8391/539 0486
Fax: 04-537 6380

SOURTHERN ZONE (JOHOR)
Atomic Energy Licensing Board
Ministry of Science, Technology and Innovation
Sourthern Zone Branch
No. 26, Jalan Sri Putra 1
Bandar Putra, 81000 Kulai, Johor
Tel: 07-663 2431/663 4300
Fax: 07-663 2409

EASTERN ZONE (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

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: 086-330 469/315 469/339 469
(Direct Line to Branch Chief)
Fax: 086-332 469

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

CONTENTS

A MILLION THANKS

The Board of AELB and the Department's top management would like to take this opportunities to thank 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 organisational goals which ensure that AELB will remain as an effective, credible and relevant 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 the Minister of Science, Technology and Innovation who is in charge of the Act and the Government of Malaysia on matters relating to the same Act, controlling the use of atomic energy, forging scientific co-operation to fulfilthe obligations arising from legal agreements, conventions or international treties that relate to the purpose of the peaceful uses of atomic energy. The Board of AELB'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 though 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 report to the Secretary General of MOSTI.

LEGISLATION AND REGULATIONS GOVERNING AELB

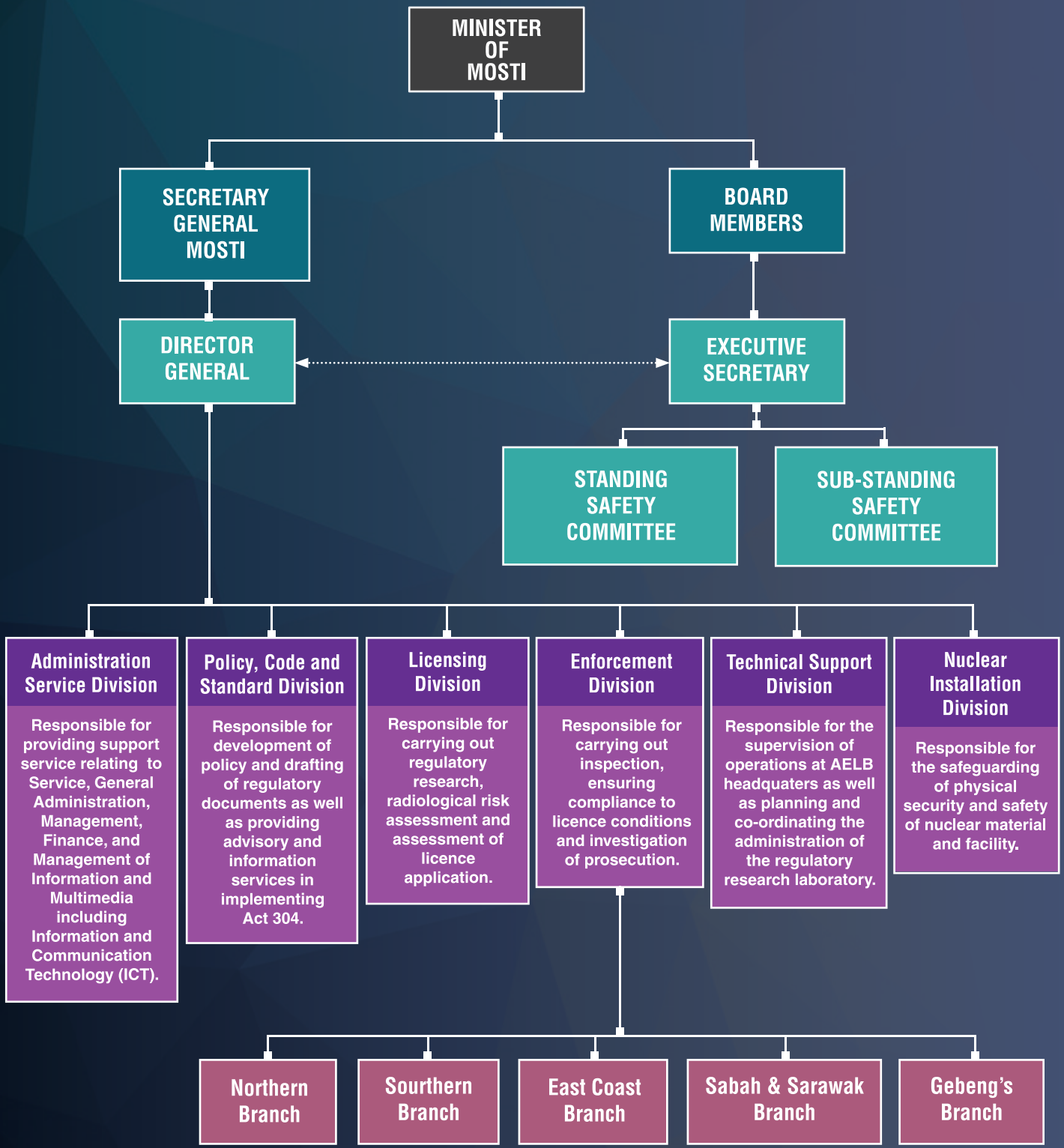
ATOMIC ENERGY LICENSING ACT 1984 (ACT 304)

- To provide for the regulation and control of atomic energy.
- For the establishment of standards on liability for nuclear damage.
- Matters connected therewith or related thereto.

REGULATORY AUTHORITY

- AELB was establish under Section 3 of the Act 304.
- Ensuring safety, security and safeguarding peaceful nuclear activities.

ORGANISATION CHART



WHO'S WHO AT AELB

Board Members

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

Board Members
Y. Bhg. Prof. Datin Paduka Dr. Khatijah bt. Mohd Yusoff
Deputy Secretary General - Science
Ministry of Science, Technology and innovation (until 31 October 2013)

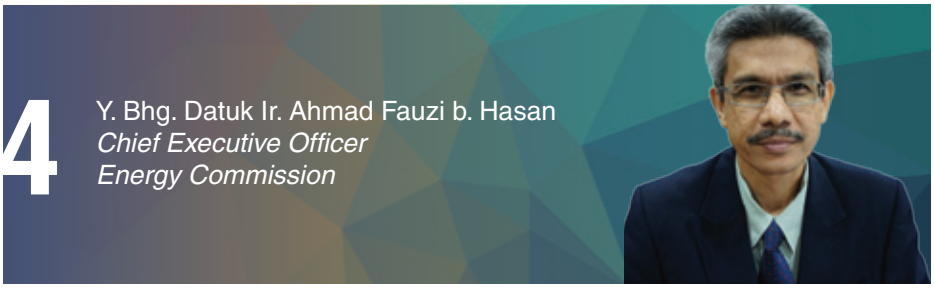
1

2

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

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

3



4

Y. Bhg. Datuk Ir. Ahmad Fauzi b. Hasan
Chief Executive Officer
Energy Commission

Executive Secretary
Y.M. Raja Dato' Abdul Aziz b. Raja Adnan
Director General
Atomic Energy Licensing Board
Ministry of Science, Technology and Innovation

Top Management

OFFICE OF THE DIRECTOR GENERAL
Y.M. Raja Dato' Abdul Aziz b. Raja Adnan
Director General

Dr. Noor Hasnah bt. Mohamed Khairullah
Special Adviser

Saidatul Akmar bt. Suberi
Legal Adviser
(until 20th November 2013)

ADMINISTRATION SERVICES DIVISION
Danny Al Jeffery b. Abdullah
Director

POLICY, CODE & STANDARD DIVISION
Acting Director: Monalija bt. Kostor

LICENSING DIVISION
Hasmadi b. Hassan
Director

NUCLEAR INSTALLATION DIVISION
Mohd Pauzi b. Mohd Sobari
Director

ENFORCEMENT DIVISION
Hamrah b. Mohd Ali
Director

TECHNICAL SUPPORT DIVISION
Mohd Yasin b. Hj. Sudin
Director

PROFILE OF AELB

ESTABLISHMENT

The Establishment of AELB since February 1, 1985 enables the Malaysian Goverment to effectively control, inspect and enforce atomic energy activities in Malaysia. There was a rapid rise in such activities after 1968 when the Goverment passed the Radioactive Substances Act 1968 to control the use of radioactive substances, primarily in the medical field. In April 1984, the Malaysian Parliament passed the Atomic Energy Licencing 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 requirement.

FUNCTION

- 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 purposes of the Atomic Energy Licensing Act 1984.
- Performing as and when directed by the Government of Malaysia to 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 Aomic 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 inspection and enforcement.
  - Carrying out regulatory research.
  - 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 Enviroment**

  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 enviroment. AELB also ensures the safe use of radiation equipment for medical and HEALTH purposes as well as helps protect the ENVIRONMENT though the use or relevent legislations 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 Malaysian'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 though national legislation.

OPERATIONAL REPORT

DEVELOPMENTS RELATED TO SECURITY OF NUCLEAR MATERIALS

- **Supporting Multilateral Instruments**
  Malaysia is at the final stages of revising its Atomic Energy Licensing Act 1984 (Act 304) which will incorporate the provisions of the International Atomic Energy Agency (IAEA) Convention on Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment Protocol; the International Convention for the Suppression of Acts of Nuclear Terrorism (ICSANT); and the Additional Protocol to the IAEA Comprehensive Safeguards Agreement.

  This comprehensive nuclear law will enable Malaysia to become a party to the various conventions and protocols on nuclear security, including Malaysia's accession to the CPPNM, ratification of the ICSANT and the IAEA Additional Protocol as well as the adoption of various IAEA Codes of Conduct.

- **Strengthening the National Nuclear and Radiological Materials Security System**
  Malaysia continues to implement the Strategic Trade Act (STA) 2010 (Act 708) which was enacted on 1 July 2011. The Act aims to combat the proliferation of weapons of mass destruction by controlling the export, transit, trans-shipment and brokering of strategic materials. The enactment of the STA reflects Malaysia's commitment to implement UNSCR 1540.

  Malaysia has implemented its State System of Accounting and Control of Nuclear Materials to enhance supervision and control of its research reactors. AELB is working closely with the United States on the physical protection upgrades for nuclear irradiators through the Global Threat Reduction Initiative (GTRI) cooperation programme. There are four Radioactive Sources Category 1 Facilities in Malaysia which underwent the process of assessment in February 2012, namely SINAGAMA, Gamma Green House, Gamma Cell and Raymintex.

  AELB officials who participated as invited experts to IAEA programmes, at the national and regional level have shared best practices and knowledge related to nuclear security with other participants. It continues to implement the nuclear security measures stipulated in

the IAEA Nuclear Security Plan 2010-2013. Malaysia is also involved in the IAEA national project called *NSF 11318 - Deployment of Radiation Detection Equipment for Nuclear Security Applications* to further strengthen the human capital development in nuclear security.

- **Contribution to IAEA Activities Related to Nuclear Security**

  Malaysia is committed in implementing the IAEA Information Circular - INFCIRC/225 - on the physical protection of nuclear materials and facilities.

  It has implemented the provisions of the IAEA Code of Conduct on the Safety and Security of Radioactive Sources as well as the Supplementary Guidance on the Import and Export of Radioactive Sources. Awareness and competency programmes have been carried out to increase the level of competency among authorized users of radioactive sources in the country.

  Malaysia continues to ensure that all activities related to nuclear security complies with international standards and guidance as defined by the IAEA. AELB recently reviewed its Integrated Nuclear Security Support Plan (INSSP) which has proven to be a very useful tool in the designing of a sustainable national nuclear security capability programme.

  With the assistance from the IAEA, Malaysia has established the INSSP for the period of 2009-2013 as a comprehensive plan to further improve nuclear security in the country. AELB has also revised its INSSP for the period of 2013-2015 to include IAEA recommendations.

- **Support for Activities Related to International Nuclear Security**

  Malaysia has endorsed the Statement of Principles to the Global Initiative to Combat Nuclear Terrorism (GICNT).

  On 3 June 2013, Malaysia became a registered user of the International Catalogue of Sealed Radioactive Sources and Devices (ICSRS). This has allowed Malaysia to identify sources, devices housing the sources and details of manufacturers and suppliers worldwide.

Malaysia is currently negotiating with Myanmar on cooperation in this area, including the exchange of best practices and experiences in nuclear security.

- **Contribution to the Minimization of Sensitive Nuclear Materials**

  Almost 3000 disused sealed radioactive sources (DSRS) are being stored in the temporary storage facility of the Malaysia Nuclear Agency. To safeguard the safety and security of these DSRS, Malaysia, with the assistance of the IAEA, is in the process of developing a disposal facility - using borehole technology - to manage these disused sources in a safe and secure manner.

  Under the National Science, Technology and Innovation Policy, Malaysia is exploring the viability of thorium as an energy source material for nuclear power generation. The policy calls for a Flagship Programme to support the development of new emerging technologies. One of the main focuses under the programme is to explore the possible utilisation of thorium from local resources for the Malaysian Nuclear Power Programme.

- **Establishment of Centres of Excellence and Support**

  Malaysia has been recognized as a Nuclear Security Support Centre (NSSC) by the IAEA since December 2012.

  Through the NSSC, Malaysia has been able to increase its domestic expertise on nuclear security and continues to enhance its law enforcement capabilities and capacities through training on rapid detection and response by the relevant law enforcement

agencies in any contingency involving nuclear or other radioactive materials.

Malaysia, in its capacity as the regional NSSC, with the cooperation of the IAEA, disseminates best practices and shares experiences with countries in the region. This serves as part of a continuous effort to strengthen its national capability and, at the same time, form an information exchange and experience sharing network.

As a NSSC, Malaysia has also been invited to IAEA programs, both at national and regional levels, in sharing best practices.

By virtue of being a NSSC, Malaysia is continuously strengthening its law enforcement capability by establishing an integrated National Nuclear Security Training Module for frontline officers. The training module addresses the roles and functions of all agencies involved when dealing with any response to a nuclear or other radioactive materials crisis. These training modules are in line with the IAEA guidance and recommendations.

The NSSC serves as a gateway to acquire knowledge and expertise and also to enhance international cooperation and assistance in nuclear security.

- **Enhancing Efforts to Combat Illicit Trafficking in Nuclear and Radiological Materials**

  On 29 March 2001, Malaysia was given access to the Illicit Trafficking Database in Nuclear Material and Other Radioactive Sources. The database is managed by the IAEA, the World Customs Organization (WCO) and the International Police Organization (INTERPOL). Malaysia's nuclear security capability has been much enhanced with access to such an international database.

  Malaysia continues to improve its radiation detection systems, ensuring that these are in accordance with the IAEA's standard Integrated Nuclear Security Network (INSN). This enables the Royal Malaysia Customs to remotely verify radiation detection at the country's points of entry and exit.

  Malaysia has in place mechanisms for radiation detection screening during major public events. This was demonstrated during the Global Entrepreneur Partnership Summit held in Kuala Lumpur in October 2013. There will be further deployment of the radiation detection mechanisms in major public events in future.

- **Strengthening Cooperation Between the Government and the Nuclear Industry**

  In August 2013, AELB was given the mandate by the Malaysian National Operation Planning

Committee to lead technical support agencies in implementing nuclear security measures in the country.

Strong emphasis is placed on promoting a culture of nuclear security in industry. Towards this end, AELB has organized and participated in various human capital development programmes related to nuclear security at international and national level.

OTHER HIGHLIGHTS OF 2013

AELB-KINS Safety Review Workshop on Reactor Digital Instrumentation and Control System (ReDICS) Upgrading Project

AELB and the Malaysia Nuclear Agency officials attended a safety review workshop organized by the Korea Institute of Nuclear Safety (KINS) in Daejeon on February 6 – 8.

The objective of the workshop was to present AELB's technical review and evaluation towards the implementation of modifications of a newly designed reactor digital instrumentation and control systems (ReDICS) from its current analog systems. The technical evaluation was carried out in line with IAEA safety requirements and AELB safety standard LEM/TEK/53, taking into accounts the best practices and recommendations of KINS.

The AELB's technical evaluation and its findings were documented in a preliminary Safety Evaluation Report (SER) which was also discussed during the workshop. The final SER was used as a basis for AELB'S regulatory decision-making process before construction approval of nuclear facilities can be issued.

There was also an exchange ceremony of the Record of Discussion (ROD) for the AELB-KINS Safety Review Project of ReDICS. The ROD was exchanged between Mr Sang-Yun Kim, Director of Research and Policy Division, KINS, and Mr. Mohd Pauzi Mohd Sobari, Director of AELB's Nuclear Installation Division.

The ROD, which was prepared during the AELB-KINS Preparation Meeting of ReDICS Project at AELB on 14 and 15 August 2012, encompassed all activities that were agreed upon to be implemented with the assistance of KINS experts to ensure the successful, comprehensive regulatory review towards the implementation of the ReDICS upgrading project.

Workshop on Developing National Capacity in Afghanistan Response to a Nuclear or Radiological Emergency

AELB hosted a workshop *On Developing National Capacity in the Islamic Republic Of Afghanistan's Response to a Nuclear or Radiological Emergency.*

The workshop which was held in cooperation with IAEA on March 18 – 22 was aimed at developing the capabilities and expertise of relevant bodies in Afghanistan in response to a nuclear and radiological emergency. Ten delegates from Afghanistan attended the workshop.

Local participants from relevant agencies, including representatives from the Malaysia Nuclear Agency, Fire and Rescue Department, Armed Forces, Ministry of Health and AELB personnel, were also invited by IAEA to participate.

AELB-KINS Quality Assurance Audits on ReDICS Upgrading Project

Representatives from AELB, Malaysia Nuclear Agency, Korea Nuclear Technology (KNT) and experts from Korea Atomic Energy Research Institute (KAERI) and Korea Institute of Nuclear Safety (KINS) participated at the quality assurance audits on Reactor Digital Instrumentation and Control System (ReDICS) in Daejeon, Korea , on April 1 - 5.

The objective of the audits was to ensure that components and systems supplied are in compliance with Act 304 requirements and its subsidiary regulations.

The audit was performed based on the quality assurance manual and specified procedures which have been implemented. Also looked into were the fabrication and designing stage of structures, systems and components of ReDICS projects, which are important elements to be examined in order to ensure that the quality of modifications are in accordance with technical specifications.

Several recommendations were proposed during the following wrap-up meeting.

The five-day event included visits to KNT, KAERI and RTP companies to look at quality assurance audits.

Regional Workshop on Demonstration of Safety of Radioactive Waste Disposal Facilities

AELB was selected by IAEA and the Asian Nuclear Safety Network to organize the regional workshop on demonstration of safety of radioactive waste disposal facilities.

Twelve participants from South Korea, Bangladesh, Thailand, Philippines, Vietnam, Indonesia and Malaysia attended the workshop held at the AELB headquarters on June 17 - 21. Other related agencies such as Malaysia Nuclear Agency, Ministry of Health and Malaysia Nuclear Power Corporation attended as observers.

The purpose of the workshop was to build and strengthen capacities in the development and demonstration of safe radioactive waste disposal facilities as well as focusing on safety assessment development by the operator and its review by the regulator.

Workshop participants and observers were given exercises which aimed at enhancing understanding of the lectures. The participants also made presentations on their national situations regarding and their experience and approach in demonstrating the safety of disposal facilities in their countries.

2nd Technical Review Meeting on the Compass-M Project: Applying PSA to Existing Facilities to Develop Transferable Skill in the Use of PSA to Evaluate NPP Safety

The meeting was jointly organized by AELB-IAEA at the AELB headquarters on June 3 - 7. Besides AELB officers, the meeting was attended by members of the project committee from Malaysian Nuclear Agency, Malaysia National University and IAEA experts.

The meeting reviewed and discussed the PSA scope to be covered within the project as well as the progress of the COMPASS-M Project in terms of tasks, deliverables, terms, meetings, responsibilities and other related issues.

The project requires collaboration of experts from the regulatory body, nuclear research organizations and universities to establish state-of-the-art competence of Malaysian specialists for Probabilistic Safety Assessment (PSA) of nuclear power plants. The main focus of the project is to master PSA technology for safety assessment of nuclear power plants through practical application on the basis of the relevant IAEA Safety Standard in order to develop a PSA model for the research reactor in Malaysia.

The PSA model is meant to perform a detailed analysis of the identified dominant accident sequences and generate a report accordingly.

Regional Workshop on Essential Knowledge of Site Evaluation Report for Nuclear Power Plants

AELB, under the auspices of the Asian Nuclear Safety Network and IAEA, organized the Regional Workshop on Essential Knowledge of Site Evaluation Report on August 26 -30 in Kuala Lumpur. Besides Malaysia, about thirty participants from five countries - Bangladesh, Thailand, Vietnam, Philippines and Indonesia – and five IAEA experts attended.

The workshop introduced participants to IAEA safety requirements in the preparation of a site evaluation report which is one of the key supporting documents required when applying for a site license. Case studies from other countries were also presented by experts from Austria, India and Turkey.

Participants discussed various issues related to site evaluation for the installation of nuclear facilities, seismological and hydrological hazards, applications of management systems for site evaluation, meteorology, radiological dispersion and feasibility of emergency plans.

Participants also presented the development status of their respective country's nuclear power plant projects related to site evaluation activities as well as the specific issues to be addressed to obtain a site approval permit.

The workshop served as a platform for future national nuclear power plant operators and the AELB to identify the technical capabilities and skills to undertake site evaluation activities. It also enables AELB to evaluate the Site Evaluation Report and other supporting documents during the licensing process.

IAEA's representative Mr. H. Mahmood expressed his appreciation to Malaysia for being a close partner in promoting the use of the global and harmonized IAEA standards and the acceptance of international practice to ensure the safe operation of nuclear installations, particularly at the site evaluation stage.

International Training Course on Preventive and Protection Measures against Insider Threats at Nuclear Facilities

AELB hosted over thirty delegates from countries with existing nuclear installation (including research reactors) and embarking countries for the International Training Course on Preventive

and Protective Measures Against Insider Threat at Nuclear Facilities from September 30 to 4 October in Kuala Lumpur.

The five-day workshop familiarized participants on nuclear security measures related to insider threats such as theft of nuclear materials and sabotage as well as cyber security at nuclear facilities.

IAEA experts touched upon the basic concepts of nuclear security principles and objectives and IAEA requirements of Nuclear Security Series No. 8 with emphasis on identifying and categorizing insider threat. Various case studies related to theft and sabotage incidents were presented.

Arising from, the presentations, a concept was introduced that underlines the evaluation of preventive and protective measures and explain how these measures should be applied to enhance security against insider threats.

Workshop for Pre-Operational Inspection on ReDICS Project

Subsequent to the series of regulatory activities implemented under the AELB-KINS cooperation on Reactor Digital Instrumentation and Control (ReDICS) project, a *Workshop for Pre-Operational Inspection on REDICS Project* was held on September 23 - 27 at AELB headquarters. The objective of the workshop was to enhance understanding of the basic concept of commissioning activities of the systems, structures and components with focus on digital instrumentation and control systems.

Participants visited the Malaysia Nuclear Agency where they were guided by KINS experts in performing pre-operational inspection of the ReDICS system.

At the workshop, the IAEA Safety Requirements NS-R-4 Safety of Research Reactor and KINS practices were used as the basis for the preparation and execution of the commissioning stage pre-operational inspection. This is a crucial process to ensure that implementation of the upgrading project is in accordance with national legislation, IAEA safety requirements and other internationally accepted practices.

National Workshop on IAEA Self-Assessment for the Integrated Review of Infrastructure for Safety (IRIS) based on the Specific Safety Guide No. 16 (Establishing the Safety Infrastructure for a Nuclear Power Programme)

AELB jointly with the Malaysia Nuclear Power Corporation (MNPC) held a national workshop on Integrated Review of Infrastructure for Safety (IRIS) on December 16 - 18 in Malacca.

Two IAEA experts, Ms. Maren-Scarlett Ihlau and Mr. Nasir Mughal, and about thirty local participants from various local agencies attended. The workshop aimed to familiarize participants with the IAEA recommendation in IAEA SSG-16 (Establishing Safety Infrastructure for a Nuclear Power Programme) which underlines essential elements that should to be considered in developing a safety infrastructure to effectively supervise the future of Malaysia's nuclear power program.

Participants performed a self-assessment exercise and the use of SARIS tools was introduced.

Based on the recommendations of SSG-16, the country should perform its self-assessment, where the main output of such assessment is to identify the gaps and good practices with respect to the requirements and recommendations of the IAEA Safety Standards and to develop an enhanced action plan for each gap identified.

THE WAY FORWARD

STRATEGIC ACTION PLANS 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*

- *To develop and establish related procedures/ guidance documents for Emergency Response and Preparedness (ERP)*
- *To procure and upgrade emergency infrastructures, facilities, equipment and systems*

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*

PETUNJUK PRESTASI UTAMA (KPI) 2013

KEY PERFORMANCE INDICATOR (KPIs) 2013

KEMAJUAN PERGERAKAN OPERASI

Kemajuan 2013 telah dikawal menurut keberhasilan bidang utama dan program-program yang dilaksanakan adalah bertepatan dengan objektif MOSTI.

Di antara pelbagai Pelan Tindakan Strategik untuk bahagian AELB adalah untuk:

- Memastikan kehijauan, kebersihan dan keselamatan penggunaan teknologi nuklear di Malaysia, untuk meningkatkan keselamatan
- Menghasilkan kekayaan untuk ekonomi nasional menerusi pembangunan alam sekitar yang kondusif dari sebarang radiasi dan aktiviti nuklear.
- Memperkenalkan industri moden serta pemerolehan tahap pencapaian teknologi sensitif.
- Menggalakkan keyakinan antarabangsa menerusi kebolehan dan keupayaan rangka kawal selia nasional yang komprehensif bagi setiap aktiviti.

Carta-carta di bawah memaparkan program yang telah dijalankan dalam tahun 2013 secara terperinci dan kemajuan yang telah dicapai setakat 2013.

OPERATIONAL PROGRESS

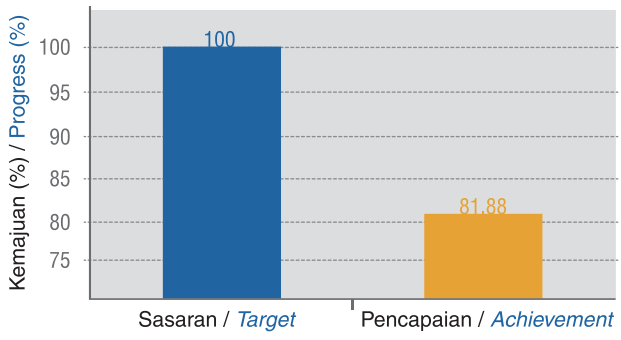
Progress in 2013 was monitored according to established Key Result Areas and the many programmes implemented were in line with MOSTI objectives.

Among these were various Strategic Action Plans for AELB's divisions to:

- *Ensure that green, clean and safe application of nuclear technology in Malaysia, to enhance safeguards,*
- *Generate wealth for the national economy through the development of a conducive environment for radiation and nuclear-related activities,*
- *Introduce modern industries and acquisition of sensitive state-of-the-art technologies and*
- *Foster international confidence through a credible and competent national regulatory framework for such activities.*

The following charts provide details on the programmes implemented in 2013 and progress achieved as at the end of 2013.

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



Keseluruhan / *Overall*	Kemajuan / *Progress* (%)
Sasaran / *Target*	100%
Pencapaian / *Achievement*	81.88%

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 Sokongan Teknikal *Progress of Technical Support Division (%)*	Kemajuan Bahagian Khidmat Pengurusan *Progress of Administration Service Division (%)*	Kemajuan Seksyen 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*	N/A	N/A	N/A	55%	N/A	N/A	N/A
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*	N/A	N/A	N/A	100%	85%	N/A	N/A
Teras Strategik 3: / *Strategic Thrust 3:* Peningkatan mekanisme 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.*	N/A	N/A	70%	78.57%	85%	N/A	N/A

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 Sokongan Teknikal** *Progress of Technical Support Division (%)*	**Kemajuan Bahagian Khidmat Pengurusan** *Progress of Administration Service Division (%)*	**Kemajuan Seksyen Komunikasi dan Multimedia** *Progress of Communication and Multimedia Division (%)*
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*	N/A	N/A	96%	N/A	90%	N/A	N/A
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*	N/A	N/A	98%	50%	N/A	N/A	N/A
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*	N/A	N/A	N/A	75%	100%	N/A	N/A

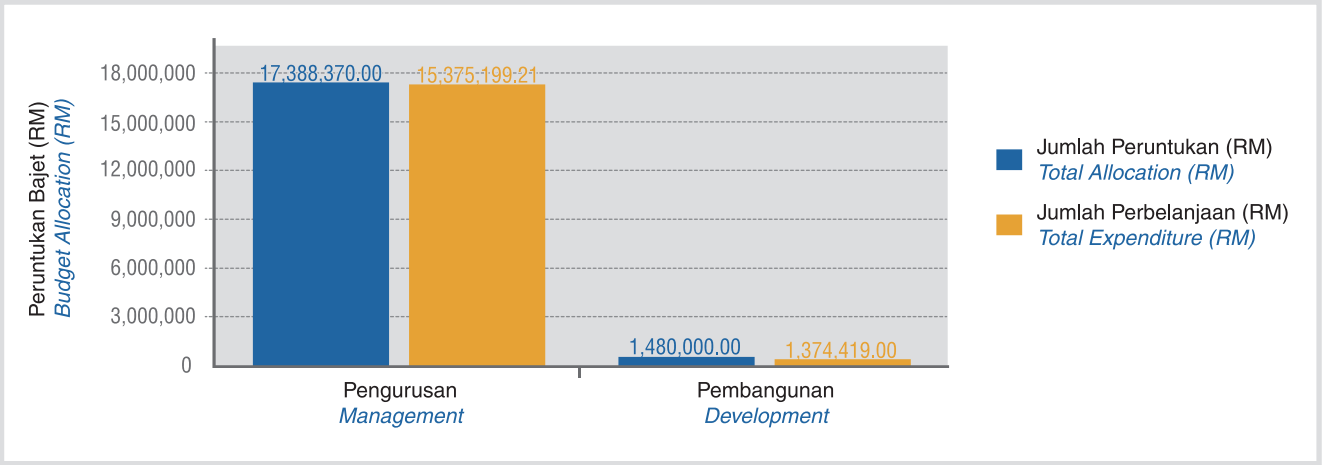
Rajah 3: Petunjuk Prestasi Utama (KPI) 2013
Figure 3: Key Performance Indicators (KPI) 2013

OBJEKTIF MOSTI *MOSTI'S OBJECTIVES*	PROGRAM *PROGRAMMES*	KPI 2013 *KPI 2013*	PENCAPAIAN *ACHIEVEMENTS*
Objektif 1 ***Objective 1*** Penghasilan Kekayaan *Wealtah Creation*	Lesen, pengiktirafan (PPS, penyelia & pengendali industri radiografi) & Import/Eksport *Licence, certification (RPOs, supervisors & radiography industry workers) and Import/Export*	RM1100,000.00	RM 1,338,544.28
Objektif 2 ***Objective 2*** Penjanaan Ilmu Pengetahuan *Knowledge Generation*	Peperiksaan Persijilan PPS *Examination to certify RPOs*	**540 calon** *540 candidates*	**540 calon** *540 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*	**11 program latihan** *11 training programmes*	**9 program latihan** *9 training programmes*
	Mewujudkan kesedaran awam dalam bidang sains, teknologi dan inovasi *To create public awareness in the fields of science, technology and innovation*	**15 program kesedaran awam** *15 public awareness programmes*	**28 program kesedaran awam** *28 public awareness programmes*
Objektif 3 ***Objective 3*** Kesejahteraan Rakyat *Well-being of the People*	Pemeriksaan / *Inspection*	**733**	**680 (92.76%)**
	Insiden/Kemalangan Radiologi *Incidents/Radiological Accidents*	**15**	**15**
	Tindakan Perundangan *Legal Action*	**-**	**155**
	Purata Dedahan Dos Pekerja Sinaran (mSv/orang) *Average Exposure Dose of Radiation Workers (mSv/person)*	**< 20 mSv**	**0.6 mSv**
	Pembangunan Dokumen *Development of Documents*	**39 dokumen** *39 documents*	**20 dokumen** *20 documents*

Pencapaian dalam memenuhi tiga objektif utama MOSTI bagi tahun 2013 ditunjukkan dalam jadual di atas.

Achievements in meeting the three key objectives of MOSTI for 2012 are shown in the table above.

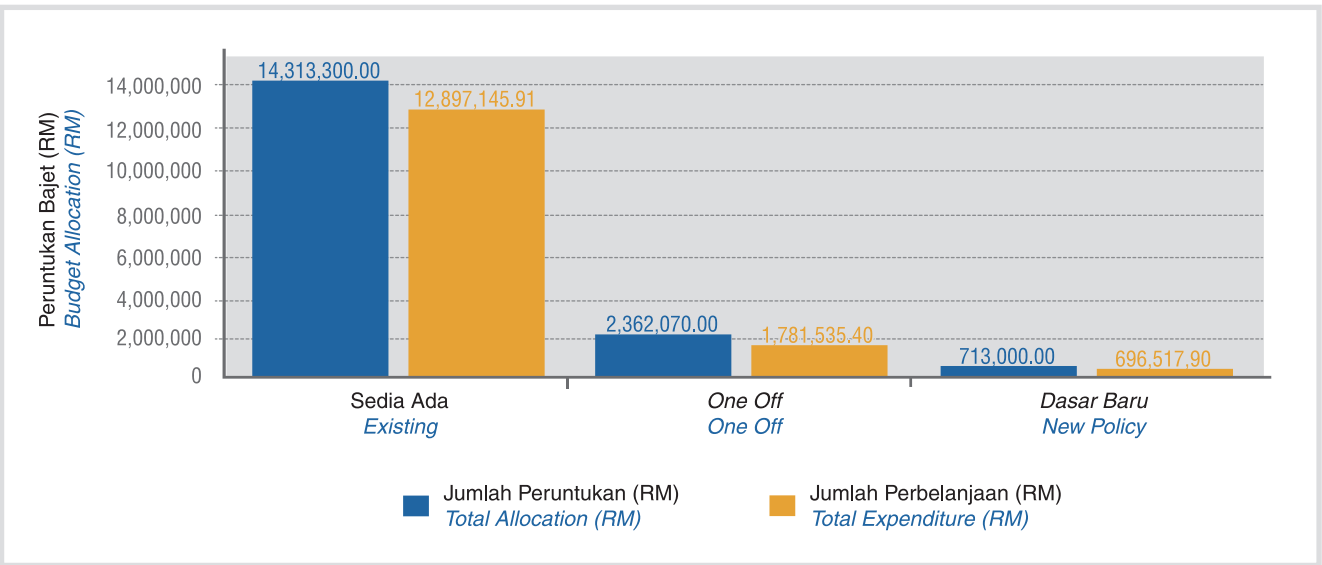
Rajah 4 : Prestasi Kewangan 2013
Figure 4 : Financial Performance 2013



Prestasi Kewangan 2013 mencatatkan jumlah peruntukan untuk perbelanjaan operasi adalah sebanyak RM 18,868,370.00, di mana sebanyak 88.79% atau RM 16,749,618.21 telah dibelanjakan.

Financial performance in 2013 recorded a total provision for operating expenses amounted to RM 18,868,370.00, where as much as 88.79% or RM 16,749,618.21 was spent.

Rajah 5 : Bajet Mengurus 2013
Figure 5 : Operation Budget 2013



Jumlah peruntukan untuk perbelanjaan mengurus pada 2013 adalah sebanyak RM 17,388,370.00 di mana sebanyak 88.24% atau RM 15,375,199.21 telah dibelanjakan.

Total allocation for operation expenses in 2013 was RM 17,388,370.00, of which 88.42% or RM 15,375,199.21 was spent.

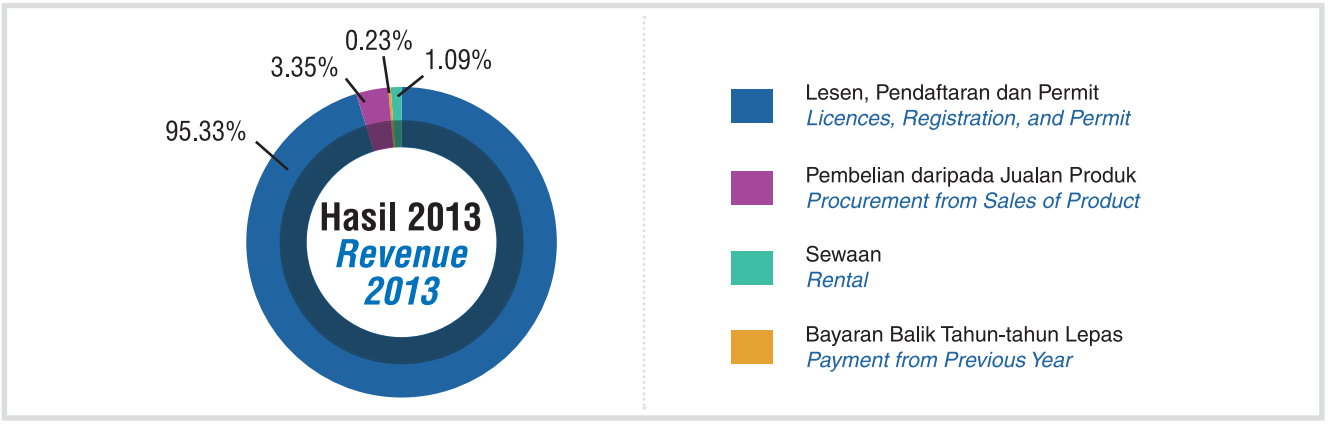
Rajah 6: Bajet Pembangunan 2013
Figure 6 : Development Budget 2013

Projek / *Project*	Peruntukan 2013 *Allocation 2013 (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*	1,480,000.00	1,374,419.00	92.87
Perolehan Peralatan Sekuriti Bahan Nuklear dan Radioaktif Kebangsaan *Acquisition of Equipment for Nuclear and Radioactive Materials Security National*	-	-	-
Jumlah / Total	**1,480,000.00**	**1,374,419.00**	**92.87%**

Pada 2013, AELB menerima peruntukan sebanyak RM 1,480,000.00 untuk membiayai projek di bawah RMK10. Dari jumlah tersebut, 92.87% telah dibelanjakan.

In 2013, AELB receive an allocation of RM 1,480,000.00 to finance projects under RMK10. Of which, 92.87% was spent.

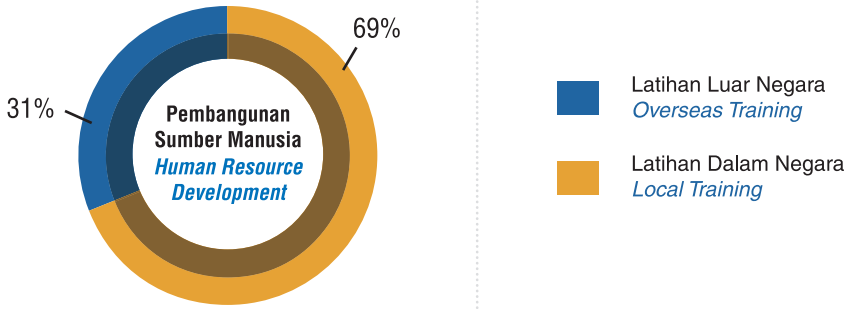
Rajah 7 : Hasil 2013
Figure 7 : Revenue 2013



Pada 2013, sebanyak RM 1,338,544.28 jumlah hasil terkumpul, di mana RM 1,275,990.00 atau 95.33% diperolehi daripada Yuran Lesen, Pendaftaran dan Permit, dan lain-lain sumber.

In 2013, total revenues collected by RM 1,338,544.28, where RM 1,275,990.00 or 95.33% derived from license fees, registration and permits, and other sources.

Rajah 8 : Pembangunan Sumber Manusia 2013
Figure 8 : Human Resource Development 2013



Pada 2013, carta pai mencatatkan seramai 212 kakitangan telah menghadiri pelbagai program latihan di mana 69% daripada program latihan tersebut dijalankan di dalam negara dan baki sebanyak 31% dijalankan di luar negara.

In 2013, a total of 212 registered pie chart staff have attended various training programs in which 69% of the training program is carried out in the country and the remaining 31% carried out abroad.

Rajah 9 : Perjawatan 2013
Figure 9 : Staffing 2013

Kategori *Category*	Kakitangan *Staff*	Diisi *Filled*	Kosong *Vacant*
P & P (Jusa C)* / *M & P (Jusa C)**	1	1	-
P & P (Kump. A)* / *M & P (Group A)**	56	51	5
Kumpulan sokongan / *Support Group*	109	105	4
Jumlah / Total	166	157	9

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

Sejumlah 166 jawatan telah ditawarkan di AELB, di mana sebanyak 157 jawatan telah diisi manakala 9 lagi masih kosong bagi tahun 2013.

A total of 166 positions were offered in AELB, in which a total of 157 posts have been filled and 9 are still vacant for the year 2013.

Rajah 10 : Ringkasan Prestasi 2013
Figure 10 : Performance Summary 2013

Bil. *No.*	Petunjuk Prestasi *Performance Indicators*	Pencapaian *Achievements 2012*	Pencapaian *Achievements 2013*	Perbezaan *Difference %*
1	Bilangan Permohonan Lesen: / *Number of Licence Applications:*			
	Bilangan Permohonan Diterima / *Number Received*	1,640	978	-40.36%
	Bilangan Diproses / *Number Processed*	1,640	889	-45.79%
2	Bilangan Pemeriksaan yang Dijalankan *Number of Inspections Conducted*	733	680	-7.23%
3	Bilangan Kertas Kerja dan Kertas Maklumat untuk Mesyuarat Lembaga *Number of Working Papers and Information Papers Presented at Board Meetings*	21	22	4.76%
4	Bilangan Maklumat Teknikal yang Dikeluarkan *Number of Technical Information Circulars Issued*	5	17	240%
5	Bilangan calon yang Diiktiraf sebagai PPS *Number of Candidates Accredited as RPOs*	537	567	5.5%
6	Bilangan Calon yang Diiktiraf sebagai Penyelia *Number of Candidates Accredited as Supervisors*	286	275	3.8%
7	Bilangan Calon yang Menduduki Peperiksaan Perlindungan Sinaran *Number of Candidates Sitting for Radiation Protection Examination*	591	540	8.6%
8	Tindakan Penguatkuasaan: / *Enforcement Actions:*			
	Fail Penyiasatan Dibuka / *Investigations Files Opened*	52	39	-25%
	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	0	0
	Penggantungan Lesen / *Licence Suspended*	1	0	0
	Amaran Bertulis Dikeluarkan / *Written Warnings Issued*	15	11	-26.67%
	Dalam Siasatan / *Under Investigations*	14	7	-50%
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	1794	-13.3%
	Eksport / *Export*	1,250	1760	40.8%
	Pergerakan / *Removals*	380	438	15.2%
10	Penguatkuasaan: / *Enforcements:*			
	Kecekapan Pegawai Penguatkuasaan *Efficiency of Enforcement Officers*	25.3	23.45	-7.31%
	Keberkesanan Pemeriksaan / *Effectiveness of Inspections*	26.9	22.79	-15.28%

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 bertanggungjawab ke atas penguatkuasaan, pemeriksaan dan pemprosesan lesen.

The above table summarises the performance of AELB according to the various indicators ranging from the number of licence applications received and processed to the efficiency of officers in charge of enforcement, inspection and licence 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/40 Sem.1	Pelantikan dan Tugas Pengendali Perunding *Appointments and Tasks Controlling Consultant*
2.	LEM/TEK/67	Pengiktirafan dan Tugas Penasihat Perlindungan Sinaran (RPA) *Recognition and Duties of Radiation Protection Advisor (RPA)*
3.	KOD/EMT/121	Pengkategorian Kawalan Di Bawah Akta 304 *Categorizing Control Under 304*
4.	KOD/EMT/122	Keperluan Program Perlindungan Sinaran, Pelan Sekuriti Punca Radioaktif Dan Pengujian Pelan Kecemasan Radiologikal Dan Nuklear Diterimapakai Sebelum Permohonan Lesen *Radiation Protection Program requirements, the Radioactive Source Security Plan And Testing Radiological and Nuclear Emergency Plan adopted Prior License Application*
5.	KOD/EMT/99 Sem.1	Kriteria Penilaian Kursus Kesedaran Keselamatan Sinaran *Evaluation Criteria Radiation Safety Awareness Course*
6.	KOD/EMT/21 Sem. 1	Prosedur Memproses Permohonan Lesen oleh AELB *License Application Process Procedure by AELB*
7.	KOD/EMT/39 Pind. 1	Kriteria Kebenaran Kepada Syarikat Penjual Yang Berlesen Untuk Mengadakan Demonstrasi Dan Pameran Peralatan Sinaran *Criteria truth to Companies Licensed Vendor To Hold Demonstration And Radiation Equipment Exhibition*
8.	KOD/EMT/81 Pind. 1	Perlaksanaan bagi a) Perintah Perlesenan Tenaga Atom (Pengecualian) (Mikroskop Elektron Pengimbas) 1998 [P.U. [A] 432/98] dan b) Perintah Perlesenan Tenaga Atom (Pengecualian) (Bahan Radioaktif Keaktifan Rendah) 2002 [P.U. (A) 182]" *Implementation of a) the Atomic Energy Licensing (Exemption) (Scanning Electron Microscope) 1998 [P.U. [A] 432/98] and b) the Atomic Energy Licensing (Exemption) (Low Activity Radioactive Substances) Regulations 2002 [P.U. (A) 182] "*
9.	KOD/EMT/12 Sem.3	Syarat Perlantikan Orang Bertanggungjawab Terhadap Lesen (OBTL) dan Penyelia *Terms of Appointment of Persons Responsible for License (OBTL) and Supervisor*
10.	KOD/EMT/79 Sem.2	Piagam Pelanggan AELB *Charter of AELB*
11.	KOD/EMT/123	Mekanisme Kawalan Aktiviti Tenaga Atom Di bawah Akta Perlesenan Tenaga Atom 1984 (Akta 304) *Atomic Energy Control Mechanism Activities Under the Atomic Energy Licensing Act 1984 (Act 304)*
12.	NP 01/2013	Standard Silibus Kursus Kesedaran Keselamatan Sinaran *Standard Radiation Safety Awareness Course Syllabus*
13.	NP 02/2013	Keperluan Memastikan Program Perlindungan Sinaran, Pelan Sekuriti Punca Radioaktif dan Pengujian Pelan Kecemasan Radiologikal dan Nuklear Diterimapakai Sebelum Permohonan Lesen *Ensure the needs of the Radiation Protection Program, Radioactive Source Security Plan and Testing Radiological and Nuclear Emergency Plan adopted Prior License Application*
14.	NP 03/2013	Sijil Kemahiran Malaysia (SKM) Bagi Ujian Tanpa Musnah (Non-Destructive Testing, NDT) Bidang Radiografi Industri Tahap 1, 2 Dan 3 Secara Normal Atau Direct Access Untuk Pengiktirafan Pekerja Sinaran Bidang Radiografi Industri *Malaysian Skills Certificate (SKM) For Non-Destructive Testing (Non-Destructive Testing, NDT) Field of Industrial Radiography Level 1, 2 And 3 In Normal Or Direct Access To Employee Recognition of Industrial Radiography Radiation Field*
15.	LEM/SPP/21	Prosedur Permohonan Penyediaan Dokumen Teknikal *Application Procedure Preparation of Technical Document*
16.	LEM/SPP/22	Garis Panduan Mengenai Pemilihan Dan Penerimaan Permohonan Penempatan Di Bawah Program Latihan Pelatih *Guidelines on the Selection and Placement of Applications Received Under Coach Training Program*

Bil. *No.*	Bil. Siri Dokumen *Document Series No.*	Tajuk Dokumen Perundangan *Title of Legal Documents*
17.	LEM/SPP/9 Sem.1	Prosedur Permohonan Mengikuti Latihan, Sambung Belajar dan Penyediaan Laporan Latihan *Application Procedures Following Training, Learning and Preparation Connect Training Report*

Bagi mempertingkatkan kecekapan AELB dalam mengawalselia aktiviti tenaga atom di Malaysia, dokumen perundangan dan bukan perundangan telah dibangunkan dan digunapakai oleh AELB dan juga pemegang lesen yang menjalankan aktiviti tersebut. Beberapa dokumen yang disediakan sepanjang tahun 2013 ditunjukkan dalam jadual di atas.

In order to enhance the efficiency in regulating AELB atomic energy activities in Malaysia, legislative and non-legislative documents have been developed and adopted by the AELB and also a licensee who carry out such activities. Some of the documents prepared during the year 2012 are shown in the schedule above.

Rajah 12 : Penguatkuasaan 2013
Figure 12 : Enforcement 2013

Bil. *No.*	Tindakan / *Actions*	Bilangan / *Total*
1	Fail penyiasatan dibuka / *Investigation files opened*	39
2	Kes dibawa ke mahkamah / *Cases brought to court*	0
3	Pembatalan lesen / *Licences cancelled*	0
4	Penggantungan lesen / *Licences suspended*	0
5	Amaran bertulis dikeluarkan / *Written warnings issued*	11
6	Dalam siasatan / *Under investigation*	7
Jumlah / *Total*		**57**

Pada 2013, sejumlah 57 tindakan penguatkuasaan telah diambil oleh AELB, mengikut undang-undang di bawah Akta 304.

In 2013, a total of 57 enforcement actions were taken by the AELB, in accordance to the enforcement law under Act 304.

Rajah 13 : Perlesenan, Kebenaran dan Pengiktirafan 2013
Figure 13 : Licensing, Approvals and Certification 2013

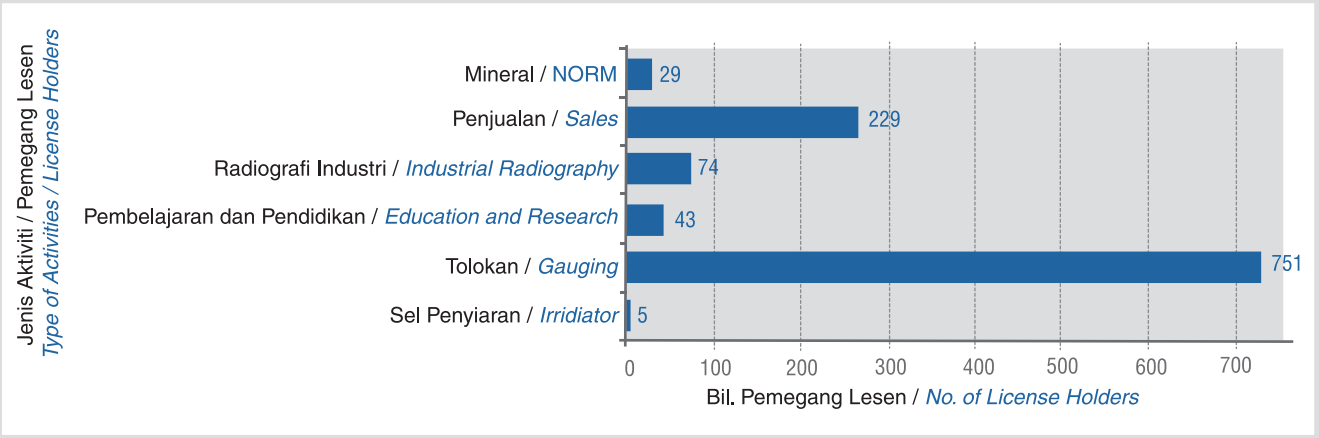
Bil. *No.*	Jenis Kelulusan / *Types of Approval*	Bilangan Kelulusan *No. of Approval*
1	Permohonan Lesen / *Licence Applications*	888
2	Kebenaran Dikeluarkan / *Approvals Issued*	3992
3	Pengiktirafan PPS / *Certification of RPOs*	567
4	Pendaftaran / *Registration*	13
Jumlah / *Total*		5460

Jumlah permohonan lesen, kebenaran dikeluarkan, pengiktirafan PPS dan pendaftaran mencapai 5,460, untuk tahun 2013. Kelulusan dikeluarkan mencatatkan jumlah tertinggi iaitu 3,992.

Number of the license application, approval, certification and registration PPS reached 5,460, for the year 2013. Approval issued the highest number of 3,992.

AKTIVITI BUKAN PERUBATAN I *NON-MEDICAL ACTIVITY*

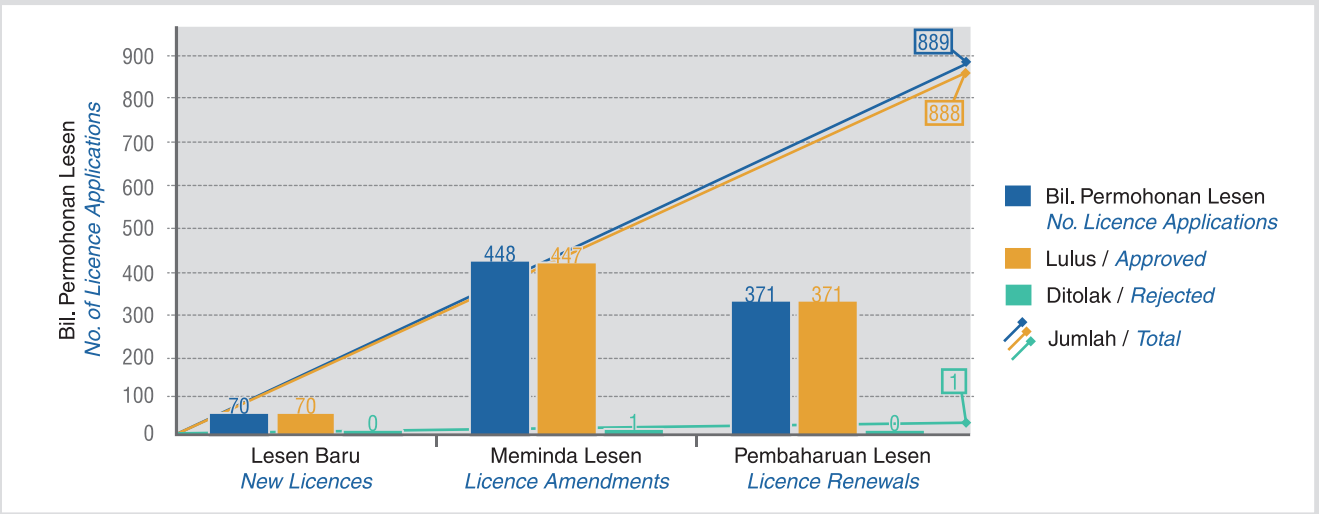
Rajah 14 : Pemegang Lesen 2013
Figure 14 : Licence Holders 2013



Tahun 2013, mencatatkan jumlah pemegang lesen mengikut jenis aktiviti berjumlah 1,201, di mana pemegang lesen Tolokan mendapat jumlah terbanyak iaitu 751, berbanding pemegang lesen Sel Penyiaran iaitu lima (5).

In 2013, noting the number of licensees by type of activity amounted to 1,201, of which the licensee Gauges got the highest number of 751, compared to cells broadcasting licensee of five (5).

Rajah 15: Permohonan Lesen 2013
Figure 15: Licence Applications 2013



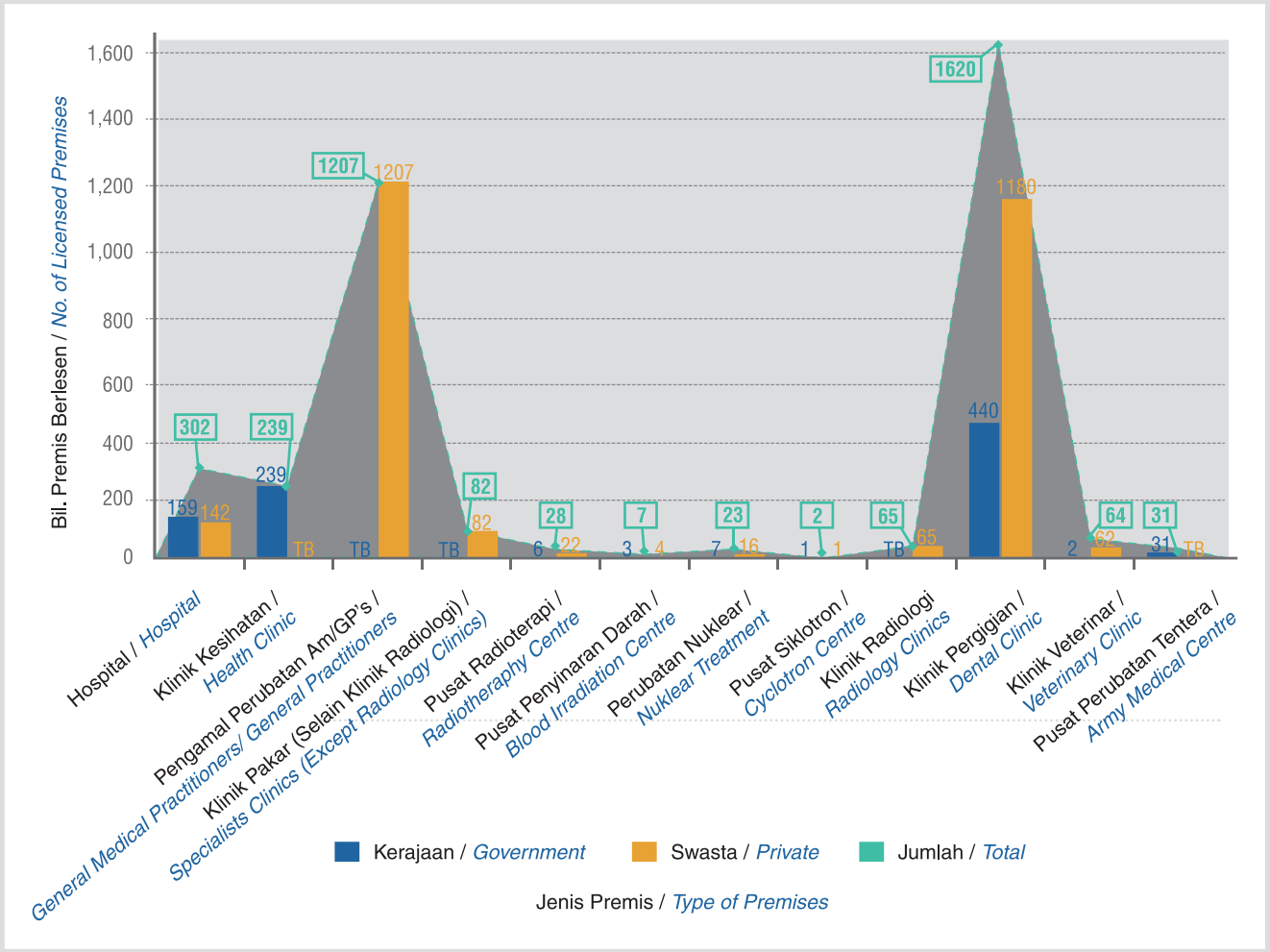
Berdasarkan rajah diatas, jumlah permohonan lesen bagi permohonan membaharui lesen, meminda lesen dan permohonan lesen baru ialah 889 di mana hanya satu (1) permohonan tidak diluluskan oleh AELB.

Based on the diagram above, the number of license applications for license renewal application, license amendments and new license applications was 889 of which only one (1) application is not approved by the AELB.

AKTIVITI PERUBATAN I *MEDICAL ACTIVITY*

Rajah 16 : Statistik Jumlah Premis Berlesen (Swasta) dan Premis Berdaftar (Kerajaan) sehingga 31 Disember 2013

Figure 16 : Statistics on the Number of Licensed Premises (Private) and Registered Premises (Government) as at December 31,2013



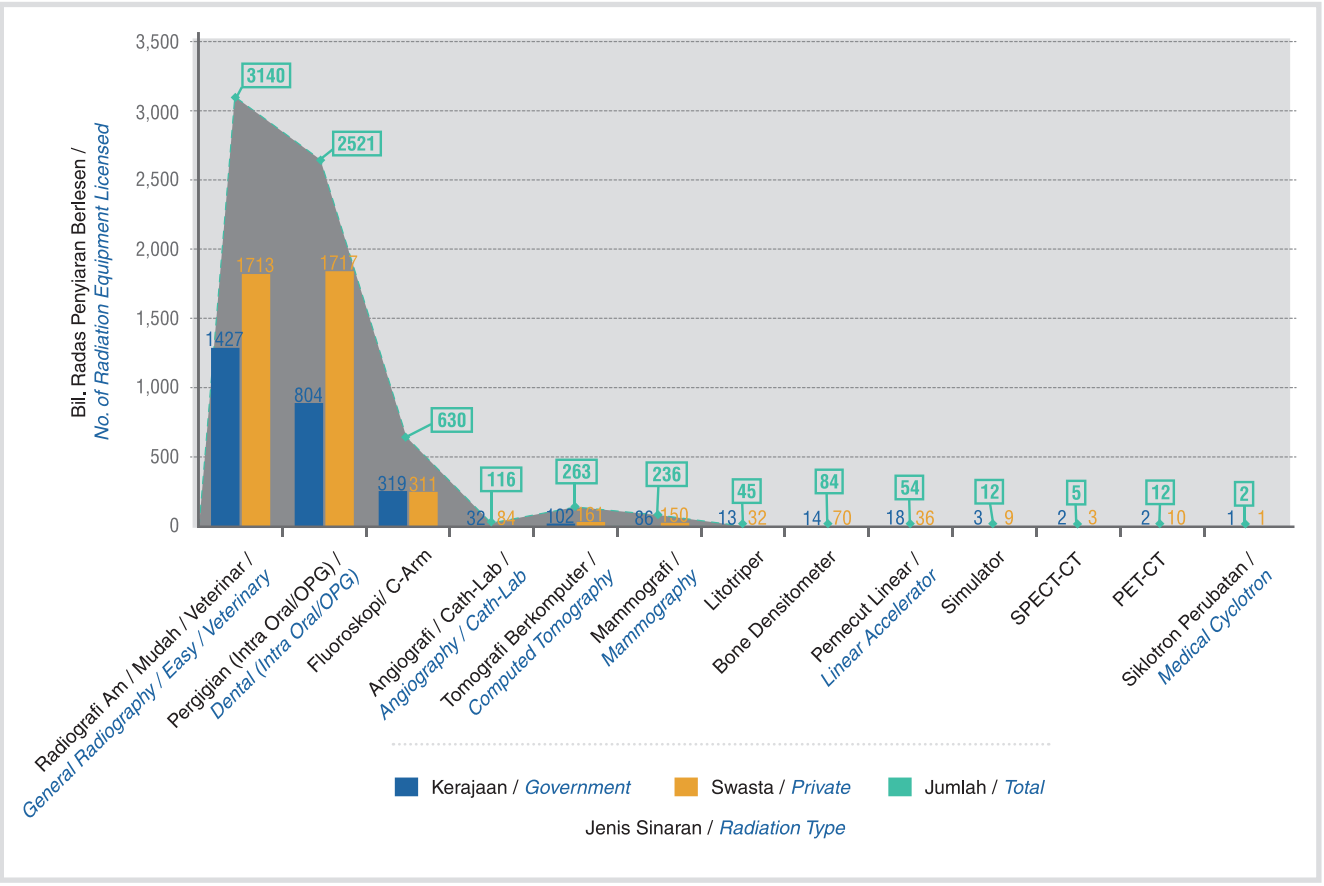
Sumber: Seksyen Keselamatan Sinaran, Kementerian Kesihatan, Malaysia
Source: Radiation Safety Section, Ministry of Health Malaysia

Pada Tahun 2013, terdapat sebanyak 889 premis kerajaan yang berdaftar berbanding 2,781 premis swasta yang berlesen menjadikan jumlah keseluruhan premis yang terlibat dalam penggunaan sinaran mengion bagi maksud perubatan adalah 3,670. Perincian bilangan premis berdaftar dan berlesen mengikut jenis premis bagi kedua-dua sektor divisualkan dalam Rajah 16.

In 2013, there were 889 government premises registered over 2,781 private licensed premises bringing the total number of premises involved in the use of ionizing radiation for medical purposes is 3,670. Average number of registered and licensed premises by type of premises for both the visualized in Figure 16.

Rajah 17 : Jumlah Radas Penyiaran Mengikut Jenis / Kategori Berlesen / Pendaftaran sehingga 31 Disember 2013

Figure 17 : Total Radiation Equipment According to Type / Licence Category / Registration as at December 31, 2013



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

Bagi statistik radas penyiaran pula, terdapat sejumlah 2,832 radas penyiaran yang berdaftar di sektor kerajaan daripada 7,120 jumlah keseluruhan radas penyinaran yang direkodkan pada tahun 2013 manakala 4,297 radas penyinaran dilesenkan di sektor swasta. Perincian bilangan radas penyinaran yang terdapat di sektor kerajaan dan juga di sektor swasta ditunjukkan mengikut adalah seperti dalam Rajah 17.

For statistical broadcasting apparatus, there are a total of 2,832 registered broadcasting apparatus in the government sector than 7,120 total irradiation apparatus that recorded in 2013, while 4,297 irradiating apparatus licensed in the private sector. Average number of irradiating apparatus contained in the government sector and in the private sector is as shown in Figure 17.

Rajah 18 : Kelulusan 2013
Figure 18 : Approvals 2013

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* Eksport / *Export* Pergerakan / *Removals*	 **1794** **1760** **438**
2	Pengkelasan Kawasan / *Area Classifications*	**184**
3	Bilangan Pinjaman yang Diluluskan: / *Number of Approvals for Loans:* Radas Penyinaran / *Radiation Equipment* Bahan Radioaktif / *Radioactive Materials*	 **5** **15**
4	Ubah Lokasi Peralatan Sinaran / Relocation of Radioactive Equipment	**112**
5	Bilangan Kebenaran Melibatkan Pekerja: *Number of Approvals Relating to Workers:* Peminjaman Pekerja Sinaran / *Loan of Radiation Workers* Pemberhentian Pekerja / *Termination of Employment*	 **56** **3115**
6	Pembinaan Kemudahan Penstoran (untuk Syarikat yang Menjalankan Ujian Tanpa Musnah sahaja) / *Construction of Storage Facilities (for Non-Destructive Testing Companies only)*	**69**
7	Transit Bahan Nuklear / *Transit of Nuclear Substance*	**3**
8	Pengurusan Bahan-bahan Buangan: PELUPUSAN *Management of Discarded Materials: DISPOSABLE* Bahan Radioaktif / *Radioactive Materials* Radas Penyinaran / *Radiation Equipment* Penangkap Kilat Radioaktif / *Radioactive Lightning Arrester*	 **1182** **154** **0**
9	Pemasangan/Uji/Senggara Radas Penyinaran *Installation/Testing/Maintenance of Radiation Equipment*	**3317**
10	Melakukan Kerja-kerja Radiografi di Kawasan Awam *Conducting Radioactive Works in Public Places*	**91**
11	Kemudahan Bilik Dedahan / *Exposure Room Facilities*	**25**
12	Pameran/Demonstrasi Peralatan Radioaktif *Exhibition/Demonstration of Radiation Equipment*	**111**
13	Pertukaran Alamat Syarikat / *Change of Addresses of Companies*	**230**
14	Pertukaran Orang Bertanggungjawab Terhadap Lesen *Change of Persons Responsible for Licensing*	**425**
15	Bilangan Pembubaran Lesen / *Number of Licences Dissolved*	**97**
16	Designasi Inspektor Kawalgunaan IAEA *Designation of IAEA Safeguards Inspectors*	**27**
17	Pembatalan Inspektor Kawalgunaan IAEA *Cancellation of IAEA Safeguards Inspectors*	**20**
Jumlah / *Total*		**13230**

AELB telah memproses sebanyak 13,230 jenis kelulusan seperti yang ditunjukkan dalam rajah di atas, untuk tahun 2013.

AELB has processed a total of 13,230 type approval as shown in the diagram above, for the year 2013.

Rajah 19 : Statistik Permohonan Kebenaran Pekerja 2013
Figure 19 : Statistic on Applications for Approvals of Workers 2013

Bil. *No.*	Keputusan Permohonan / *Application Results*	Lulus *Passed*	Gagal *Failed*
1.	Pemberhentian Pekerja Sinaran / *Termination of Radiation Workers*	2594	717
2.	Pinjaman Pekerja / *Loan of Workers*	28	26
3.	Pengiktirafan Khidmat Juruperunding / *Service Certification of Consultants*	314	60
4.	Pengiktirafan Pegawai Perlindungan Sinaran / *Certification of RPOs*	355	211
5.	Pengiktirafan Pengendali Pelatih / *Certification of Trainee Operators*	290	153
6.	Pengiktirafan Pengendali Senggaraan / *Certification of Maintenance Operators*	269	131
7.	Pengiktirafan Pengendali Sinaran / *Certification of Radiation Operators*	2258	371
8.	Pengiktirafan Penyelia / *Certification of Supervisors*	189	85
9.	Pertukaran Orang Bertanggungjawab Terhadap Lesen *Transfer of Persons Responsible for Licences*	267	123
10.	Designasi Inspektor Kawalgunaan IAEA / *Designation of IAEA Safeguards Inspectors*	27	0
11.	Pembatalan Inspektor Kawalgunaan IAEA / *Withdrawn of IAEA Safeguards Inspectors*	20	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*		**6611**	**1877**

Untuk tahun 2013, keputusan permohonan seperti pembaharuan, pemberhentian, pinjaman, pensijilan dan pemindahan telah dibahagikan kepada kategori lulus dan gagal. Jumlah yang dicatat bagi setiap kategori adalah 6611 (lulus) dan 1877 (gagal).

For the year 2013, the results of such an application for renewal, termination, loans, certification and transfer has been divided into categories of pass and fail. The amount charged for each category is 6611 (undergraduate) and 1877 (failed).

Rajah 20 : Keputusan Peperiksaan PPS Mengikut Aktiviti bagi Tahun 2005-2013
Figure 20 : Examination Results for RPOs According to Activities for the Period 2005-2013

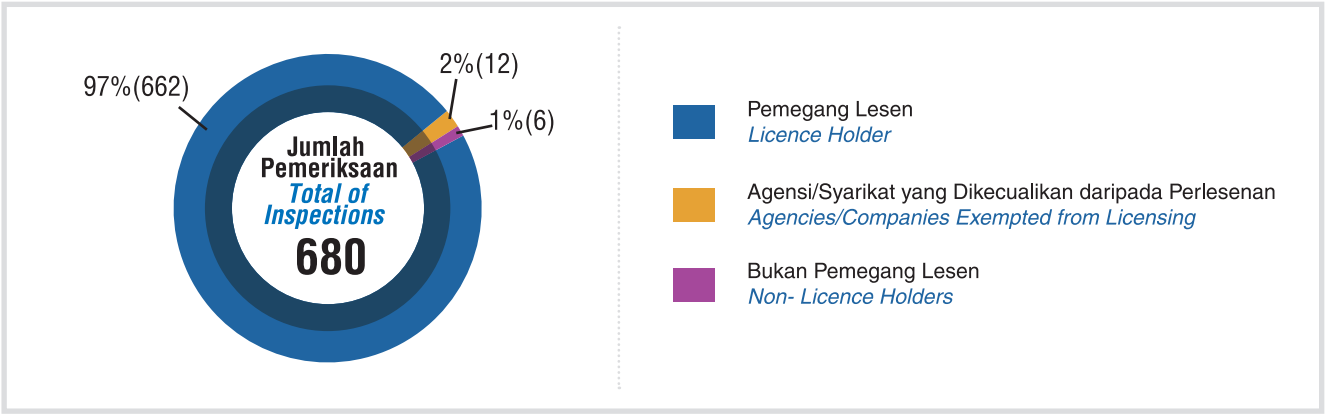
Tahun *Year*	Keputusan *Results*	Jumlah *Total*
2005	Lulus / *Passed*	**276**
	Gagal / *Failed*	**260**
2006	Lulus / *Passed*	**276**
	Gagal / *Failed*	**456**
2007	Lulus / *Passed*	**251**
	Gagal / *Failed*	**419**
2008	Lulus / *Passed*	**232**
	Gagal / *Failed*	**498**
2009	Lulus / *Passed*	**223**
	Gagal / *Failed*	**413**
2010	Lulus / Passed	**162**
	Gagal / Failed	**419**
2011	Lulus / Passed	**183**
	Gagal / Failed	**367**
2012	Lulus / Passed	**151**
	Gagal / Failed	**440**
2013	Lulus / *Passed*	**131**
	Gagal / *Failed*	**429**

Tahun 2013, mencatatkan seramai 560 PPS telah menduduki peperiksaan, di mana seramai 131 telah lulus manakala 429 telah gagal. Rajah di atas menunjukkan keputusan peperiksaan PPS mengikut kategori dari tahun 2005 hingga 2013.

In 2013, PPS has recorded a total of 560 examinations, in which a total of 131 have passed while 429 have failed. The figure above shows the results of the examination PPS by category from 2005 to 2013.

PENGUATKUASAAN I *ENFORCEMENT*

Rajah 21 : Pemeriksaan 2013
Figure 21 : Inspections 2013



Pada 2013, sejumlah 680 pemeriksaan / serbuan telah dijalankan oleh AELB, di mana peratus pemeriksaan pemegang lesen iaitu sebanyak 97%.

In 2013, a total of 680 inspections / raids were carried out by AELB, where the percentage of inspections of licensees by 97%.

Rajah 22 : Tindakan Perundangan 2013
Figure 22 : Regulatory Actions 2013

Tindakan Bersabit Peraturan *Regulatory Actions*	2005	2006	2007	2008	2009	2010	2011	2012	2013
Arahan Henti Operasi *Stop Work/Operation Order*	97	89	57	49	64	97	75	68	73
Amaran Bertulis dan Peringatan *Written Warnings & Reminders*	43	71	14	23	26	35	37	64	43
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	0
Siasatan / *Investigations*	23	47	13	31	47	46	31	52	39
Jumlah / *Total*	**163**	**231**	**111**	**121**	**176**	**221**	**143**	**197**	**155**

Pada 2013, sejumlah 155 tindakan perundangan telah diambil, di mana arahan henti operasi mencatatkan jumlah tertinggi iaitu 73. Rajah turut menunjukkan tindakan perundangan yang telah diambil dari 2005 hingga 2013.

In 2013, a total of 155 regulatory actions were taken, of which stop work/operation order recorded the highest number at 73. The figure also shows the total regulatory actions taken from 2005 to 2013.

Rajah 23 : Aduan Awam 2013
Figure 23 : Public Complaints 2013

Aktiviti / *Activities*	Bil. Aduan Diterima *No. of Complaints*	Tindakan Pemeriksaan AELB *Inspection Actions by AELB*
Orang Awam / *General Public*	17	17
Kemalangan Sinaran / *Radiation Accidents*	14	14
Dalaman / *In-house*	0	0
Jumlah / *Total*	**31**	**31**

Sebanyak 31 aduan awam telah diterima pada tahun 2013 iaitu daripada aktiviti yang dijalankan oleh orang awam dan kakitangan dalaman serta aduan mengenai kemalangan sinaran. AELB telah menyelesaikan kesemua aduan dengan mengambil tindakan pemeriksaan.

A total of 31 complaints were received in 2013, from the activities carried out by the public and internal staff as well as complaints about radiation accidents. AELB has completed all of the complaints by taking measures of inspection.

Rajah 24 : Dos Tahunan Pekerja Sinaran 2013
Figure 24 : Radiation Workers Annual Dose 2013

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		673 (0 man-mSv)	6,430 (0 man-mSv)	7,103 (0 man-mSv)
0.1 – 5.0		412 (787.46 man-mSv)	195 (341.66 man-mSv)	607 (1129.12 man-mSv)
5.1 – 18.0		236 (2103 man-mSv)	35 (266.91 man-mSv)	271 (2369.91 man-mSv)
18.0 – 20.0		10 (190.33 man-mSv)	0	10 (190.33 man-mSv)
20.1 – 50.0		22 (614.55 man-mSv)	3 (102.42 man-mSv)	25 (1331.52 man-mSv)
>50.1		5 (385.75 man-mSv)	0	5 (385.75 man-mSv)
Jumlah PS / *Total of RW*		1,358	6,663	8,021
Jumlah Dos / *Total of Dose*		4,081.09	710.99	4,792.08
Purata Dedahan Dos (mSv/ orang) *Average of Dose Exposure (mSv/ person)*	**Tahun / *Year***			**Purata / *Average***
	2005	4.19 mSv	0.24 mSv	0.68 mSv
	2006	4.38 mSv	0.13 mSv	0.69 mSv
	2007	4.99 mSv	0.59 mSv	1.09 mSv
	2008	6.04 mSv	0.07 mSv	0.84 mSv
	2009	6.73 mSv	0.23 mSv	0.66 mSv
	2010	4.24 mSv	0.15 mSv	0.68 mSv
	2011	2.98 mSv	0.06 mSv	0.53 mSv
	2012	4.02 mSv	0.07 mSv	0.61 mSv
	2013	**3.00 mSv**	**0.12 mSv**	**0.6 mSv**

Pada 2013, pekerja sinaran seramai 8,021, di mana 1,358 adalah PS dalam radiografi industri dan 6,663 dalam aktiviti-aktiviti lain. Purata dedahan dos (mSv/orang) adalah 0.6 mSv. Radiografi industri mencatatkan sebanyak 3.00 mSv manakala aktiviti-aktiviti lain mencatatkan 0.12 mSv.

In 2013, a total of 8,021 radiation workers, where 1,358 is the PS in industrial radiography and 6,663 in activities other. The average exposure dose (mSv / person) is 0.6 mSv. Industrial radiography record of 3.00 mSv, while other activities are recorded 0.12 mSv.

KATA SINGKATAN

AELB	Lembaga Perlesenan Tenaga Atom
AMEM	ASEAN Ministers in Energy Meeting
ANSN	Asian Nuclear Safety Network
ARE	Asian Rare Earth
BAPETEN	Badan Pengawas Tenaga Nuklir
CBT	Latihan Asas Komputer
CoC	Kod dan Etika
COP	Kod dan Panduan Amalan
DoE	Department of Energy
e-BLESS	Business Licensing Electronic Support System
EBP	Program Bajet Tambahan
eKL	Sistem Perbankan Internet
ERMS	Sistem Pemantauan Radiologi Persekitaran
EUEU	End User Licensing Analysis
ERT	Pasukan Kendalian Kecemasan
IAEA	International Atomic Energy Agency
ICT	Teknologi Maklumat dan Komunikasi
ISE	Integrated Safety Evaluation
JKK	Jawatankuasa Kerja Keselamatan
JKKN	Jawatankuasa Kecil Keselamatan Nuklear
JKKPR	Jawatankuasa Kecil Keselamatan Perlesenan Reaktor Nuklear
JKN	Jawatankuasa Keselamatan Nuklear
KINS	Korea Institute of Nuclear Safety
KKM	Kementerian Kesihatan Malaysia
KPIs	Petunjuk Prestasi Utama
KRAs	Perkara Utama
MBR	Material Balance Report
MNPC	Malaysian Nuclear Power Corporation
MOSTI	Kementerian Sains, Teknologi dan Inovasi
MoU	Memorandum Persefahaman
NPT	Non-Proliferation Treaty
PICC	Pusat Konvensyen Antarabangsa Putrajaya
PIL	Penyenaraian Inventori Fizikal
PIV	Physical Inventory Verification
PKA	Penguatkuasa Pelabuhan Klang
PPS	Pegawai Perlindungan Sinaran
RAD	Radiation
RPS	Program Perlindungan Sinaran
RTC	Regional Training Course
S&T	Sains dan Teknologi
SAR	Laporan Analisis Keselamatan
SOP	Prosedur Operasi Standard
ST	Strategic Thrusts
SSAC	State System of Accounting for and Control of Nuclear Material
ST&I	Sains, Teknologi dan Inovasi
TECDOC	Technical Document
TEPCO	Tokyo Electrical Power Services Co.
TENORM	Technologically Enhanced Naturally Occurring Radioactive Materials
TGs	Technical Groups
TNA	Penilaian Keperluan Latihan
TSO	Technical Support Organisation
UKM	Universiti Kebangsaan Malaysia
VPN	Virtual Private Network

ABBREVIATIONS

AELB	Atomic Energy Licensing Board
AMEM	ASEAN Ministers in Energy Meeting
ANSN	Asian Nuclear Safety Network
ANSTO	Australia Nuclear Service & Technology Organization
ARE	Asian Rare Earth
BAPETEN	Badan Pengawas Tenaga Nuklir
CBT	Computer-based Training
CoC	Code and Conduct
DoE	Department of Energy
COP	Codes of Practice
e-BLESS	Business Licensing Electronic Support System
EBP	Extra-budgetary Programme
eKL	Internet Banking System
EUEU	End User Licensing Analysis
ERMS	Environmental Radiological Monitoring System
ERT	Emergency Response Team
G-SAN	Global Safety Assessment Network
GTRI	Global Threat Reduction Initiatives
IAEA	International Atomic Energy Agency
ICT	Information and Communication Technology
IRAPTER	International Radiological Assistance Training Programme for Emergency Responders
ISE	Integrated Safety Evaluation
JAIF	Japan Atomic Industrial Forum
JAEA	Japan Atomic Energy Agency
JKK	Jawatankuasa Kerja Keselamatan
JKKN	Jawatankuasa Kecil Keselamatan Nuklear
JKKPR	Jawatankuasa Kecil Keselamatan Perlesenan Reaktor Nuklear
JKN	Jawatankuasa Keselamatan Nuklear
JNES	Japan Nuclear Energy Safety Organizations
KINS	Korea Institute of Nuclear Safety
KPIs	Key Performance Indicators
KRAs	Key Result Areas
MBR	Material Balance Report
MNPC	Malaysian Nuclear Power Corporation
MOH	Ministry of Health
MOSTI	Ministry of Science, Technology and Innovation
MoU	Memorandum of Understanding
N/A	Not Applicable
NNSA	National Nuclear Security Administration
NPT	Non-Proliferation Treaty
PICC	Putrajaya International Convention Centre
PIL	Physical Inventory Listing
PIV	Physical Inventory Verification
PKA	Port Klang Authority
RAD	Radiation
RPA	Radiation Protection Advisor
RPO	Radiation Protection Officer
RPP	Radiation Protection Programme
RTC	Regional Training Course
S&T	Science and Technology
SAR	Safety Analysis Report
SOP	Standard Operating Procedures
ST	Strategic Thrusts
SSAC	State System of Accounting for and Control of Nuclear Material
ST&I	Science, Technology and Innovation
TECDOC	Technical Document
TEPCO	Tokyo Electrical Power Services Co.
TENORM	Technologically Enhanced Naturally Occurring Radioactive Materials
TGs	Technical Groups
TNA	Training Need Analysis
TSO	Technical Support Organisation
UKM	Universiti Kebangsaan Malaysia
US	United States
VPN	Virtual Private Network

ATOMIC ENERGY LICENSING BOARD

MOSTI

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

LEMBAGA PERLESENAN TENAGA ATOM
(Atomic Energy Licensing Board)

Kementerian Sains, Teknologi dan Inovasi,
Batu 24, Jalan Dengkil, 43800 Dengkil, Selangor,
MALAYSIA.

Tel: 603-89225888 | Fax: 603-89223685

www.aelb.gov.my

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