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NUCLEAR AUSTRALIA

**NEWSLETTER OF THE
AUSTRALIAN NUCLEAR ASSOCIATION**

EDITORIAL

Sad News from ANA Queensland Inc

The formation of the Australian Nuclear Association Queensland Inc was announced in the last issue of Nuclear Australia. This initiative was led by Mr David Burden who enthusiastically set up the Association with a group of colleagues. The ANA Committee was notified last week by Ms Kate Holmes, Hon. Secretary of the Association, that Mr Burden had died suddenly on 2 August at the age of 51 after contracting a superbug. His funeral was held in Brisbane on 6 August. The members of the ANA wish to express their great sympathy at this tragic loss to his wife Marian and his daughter Angelique. The formal launch of the Association will continue to be held at the Conrad Treasury Hotel in Brisbane, on Thursday, 21 August at 5.30pm, when the guest speaker will be Dr Ziggy Switkowski, Chairman, ANSTO. All ANA members in or outside Queensland are welcome to attend the launch and further details can be obtained from Ms Kate Holmes by email at: holmeskate@hotmail.com

Progress Report from ANSTO

The OPAL Research Reactor at the Australian Nuclear Science and Technology Organisation's Lucas Heights Research Laboratories began low power testing in May after a shutdown in July 2007 due to changes which had to be made in the fuel design.. The reactor was then taken up to its full power of 20MW.

Senator Kim Carr, Minister for Innovation, Industry & Research, recently announced the appointment of Professor John Hearn and Professor David Copolov as new members of the ANSTO Board. Professor Hearn is Deputy Vice-Chancellor and Professor of Physiology at the University of Sydney and was given the Australian Centenary Medal in 2001 for his outstanding services to science and the Australian government as a scientific adviser. Professor Copolov was appointed in 2004 as Senior Adviser to the Vice-Chancellor of Monash University after 10 years as the Director of the Mental Health Research Institute of Victoria.

Australia's key engineering body – Engineers Australia – has officially recognised ANSTO's first research reactor (HIFAR) as a national engineering landmark. HIFAR was officially shutdown in January 2007 after operating safely for 47 years. It provided training for several generations of nuclear scientists and engineers as well as providing radioisotopes and radiopharmaceuticals for Australia's many hospitals, doctors and industrial applications. It also provided neutron beams for research by many scientists in Australian universities. HIFAR is now undergoing a decommissioning process which will take 10 years to complete.

Visit the website at www.ansto.gov.au for further information.

Progress Report on the Pacific Nuclear Council and 16PBNC

There are currently 14 members of the PNC including nuclear societies and non-profit trade organisations in nine countries in the Pacific Basin plus one commercial member from the USA. These represent over 60,000 professionals in nuclear science and technology and 57% of the world's nuclear power reactors. The members have recently approved an application from the Vietnam Nuclear Society to become a member.

Dr Clarence Hardy, Hon. Secretary of the ANA, will complete his two-year term as President at the PNC meeting in Aomori, Japan, on 13 October 2008, which will be held in conjunction with the 16th Pacific Basin Nuclear Conference in Aomori from 13-17 October. Dr Kang of the Korean Nuclear Society, who is currently the Vice President, will take over as President on 17 October.

Members have voted to elect Professor Juan Francois of the Mexican Nuclear Society as the next Vice President/President-Elect who will take up his position as Vice President for two years at 16PBNC.

The 16th Pacific Basin Nuclear Conference will be hosted by the Atomic Energy Society of Japan and the Japan Atomic Industrial Forum and held at

Aomori in northern Japan from 13-17 October 2008. There is a large nuclear centre at Aomori including a reprocessing plant, an enrichment plant and waste management facilities and tours will be arranged to the centre.

The topics include all aspects of nuclear power, the nuclear fuel cycle, applications of isotopes and radiation, research reactors, nuclear education, etc. Abstracts of 390 proposed papers have been accepted.

Dr Hardy will be the co-chairman of the Opening Ceremony and will present a paper in the Second Plenary Session on "Australia's Uranium Resources and Production". He will also present the Final Report of the PNC Task Group on "Public Information and Education in Nuclear Science & Technology in Pacific Basin Countries" in a later technical session.

The registration fee is Y80,000 (about A\$800). Early registration at one of the conference hotels is advised as over 600 persons are expected to attend and Aomori is only a small city. Information on the conference can be obtained from the website: www.pbnc2008 or email: info@pbnc2008.org

Latest Australian and International News

New Synroc Deal in the USA

A US\$1.4 M deal has been signed between ANSTO Inc (ANSTO's US arm) and Battelle Energy Alliance (the management company for the US Idaho National Laboratory) to demonstrate the benefits of Synroc technology for the treatment of waste on the Idaho site. The waste of particular interest is about 4,400m³ of radioactive calcine material from the reprocessing of naval reactor fuel. Two methods will be demonstrated – hot isostatic pressing (HIP) of the calcine and HIP of a synroc-calcine mix. The material can thereby be reduced in size by about a half to minimize the space needed for final storage in sealed containers

Source: www.ansto.org.au

IAEA approves India safeguards

The Board of the IAEA has approved the India-specific safeguards agreement which had earlier threatened to bring down the Indian government. It will be implemented next year. The next step in bringing India into world trade in nuclear energy materials and equipment will be consideration by the 45-member Nuclear Suppliers Group (including Australia) of exempting India from its rule of prohibiting trade with non-members of the Non-Proliferation Treaty. Following this, US Congress must approve a law to the same effect. India has six nuclear reactors under IAEA safeguards now, the new agreement will take in 14 reactors initially.

Source: World Nuclear News 1/8/08.

ANA NEWS

TECHNICAL PROGRAM FOR 2008

The next meeting for 2008 in the combined program of the ANA and Engineers Australia's Nuclear Panel will be the ANA's Annual General Meeting and a technical talk by Dr Clarence Hardy held on **Thursday, 28 August 2008** (see box for details).

ANA Annual General Meeting

in the AINSE Theatre at Lucas Heights at 12.30 pm, followed by talk at 1.00 pm. on

"Progress on Small and Medium Reactors"

By Dr Clarence Hardy, ANA

The IAEA has recommended that "small" reactors should be defined as those with an electrical output of less than 300MW and "medium" reactors 300-700MW.

The IAEA has produced a number of technical reports on these reactors in recent years and Dr Hardy's talk will be based on these reports plus his visits to many of the promising new designs in recent years and descriptions of them in international conferences

Historically, the percentages of commercial power reactors in these ranges were quite high over the last 50 years: 100% in 1951-1969; 55% in 1961-1970; 16% in 1971-1980; 25% in 1981-1990; and 21% in 1991-2000. In addition, a large number of nuclear powered ships (mainly naval) have been built with reactors less than 300MW.

Dr Hardy will review recent developments and then select a few of the most promising designs being developed at present. These will include the Pebble Bed Modular Reactor (165MW +) being developed in South Africa and China, High Temperature Fixed Bed Reactors being developed in France and Japan, barge-mounted small reactors (Russia) and a few others.

Dr Hardy believes that one or more of these types could be suitable for introduction into Australia where some states could have difficulties in adding a large nuclear plant such as the 1600MW French APR, or 1400MW Korean, Japanese or US Advanced Reactors. Time will tell as politics currently prevent them here!

The technical meetings for the rest of 2008 are:

24 Sept. Host: Nuclear Panel, Engineers Australia Theatre at 8 Thomas St, Chatswood, at 5.30 pm refreshments for 6 pm start.

"The Australian Synchrotron"

By Dr Steve Gower

Australian Synchrotron Project, Melbourne

23 October Host: ANA at the AINSE Theatre at Lucas Heights at 1 pm.

"Mini-Cyclotrons and PET in Australia" (PET is Positron Emission Tomography)

By Mr Ian Turner, General Manager, ARI, ANSTO

24 October Host: ANA with venue and timing to be confirmed.

ANA 25th Anniversary Lunch and Award Presentation

26 Nov. Host: Nuclear Panel, Engineers Australia Theatre at 8 Thomas St, Chatswood, at 5.30 pm refreshments for 6pm start.

"Nuclear Education" (Title to be confirmed)

By Professor V. G. Agelidis, Univ. of Sydney

THE ANA 2008 ANNUAL AWARD

The recipient of the ANA 2008 Annual Award will be Mr John Carlson, Director-General of the Australian Safeguards and Non-Proliferation Office (ASNO) in Canberra since 1989. Mr Carlson will be presented with the Award at the ANA Annual Lunch in Sydney on 24 October.

The Award is made in recognition of his outstanding contributions to progressing safeguards and non-proliferation on behalf of Australia over many years.

Mr Carlson has been a member of the government's Senior Executive Service since 1976 and has been involved in nuclear, petroleum and energy policy issues. He was an Alternate Governor for Australia on the IAEA Board of Governors and Chair of SAGSI (IAEA's Standing Advisory Group on Safeguards Implementation) from 2001 to 2007.

REPORTS ON MEETINGS

REPORT ON THE NUCLEAR PANEL MEETING, 28 MAY 2008

Dr Clarence Hardy, ANA, spoke on the **“Rebirth of the Russian Nuclear Industry”** at a meeting hosted by the Engineers Australia Nuclear Panel at 6 pm in the Lecture Theatre at 8 Thomas St, Chatswood.

Russia has had a long and successful nuclear industry for over 50 years. It currently has 31 nuclear power stations with seven under construction and an additional eight planned. Russia also has all stages in the nuclear fuel cycle including uranium mining, conversion, enrichment, fuel fabrication, reprocessing and waste disposal facilities. It has had a long experience in operating fast reactors coupled to desalination plants.

Last year, under President Putin’s direction, the Russian nuclear industry underwent a major reorganization to enable it to compete even more effectively on the world stage. Russia has the largest enrichment capacity in the world and already supplies over half of the USA’s enrichment requirements. Russia has exported nuclear power stations to China and Iran in recent years based on 40 years’ experience in building in Eastern Europe and Finland and it is now building reactors in India.

Russia is under discussions with the IAEA to set up an international nuclear fuel centre at its enrichment plant at Angarsk in Russia in association with Kazakhstan.

If Russia achieves its ambitious program of building a large number of new nuclear power stations in Russia and exports a number overseas, as well as expanding its nuclear fuel cycle industries, it will play a dominant role in the worldwide nuclear industry in the next two decades.

The talk prompted a large number of questions on all aspects of the Russian nuclear industry.

REPORT ON THE ANA MEETING, 26 JUNE 2008

Mr Ian Turner, General Manager, ANSTO Australian Radioisotopes spoke on **“The World of Molybdenum-99”** at 1pm in the AINSE Theatre at Lucas Heights.

Mr Turner explained how ANSTO’s old reactor HIFAR had produced Mo-99 and several other important radioisotopes for use in medicine and industry for many years. This production will now be taken over by the new reactor OPAL which has a greater capacity to supply the expanding needs for these vital isotopes and radio-pharmaceuticals.

Mo-99 is the most important radioisotope for nuclear medicine in the world because its daughter product, technetium-99m, can be coupled to a variety of compounds to diagnose a range of medical conditions. It is usually supplied to hospitals and doctors in the form of a generator which allows the Tc-99m product to be provided on a daily basis in solution ready for injection.

Mr Turner explained how over half a million doses of the Tc-99m products are supplied to patients in Australia every year for diagnosis of heart, kidney, liver, bone and other conditions. New facilities have been constructed and commissioned at Lucas Heights to produce Mo-99 from low enriched uranium targets in OPAL, so that ANSTO will lead the world in using the best practice in the future. ANSTO also hoped to export its new technology.

Mr Turner gave illustrations of the type of work carried out by hospitals and doctors using these radiopharmaceuticals. He concluded that Mo-99 was the most important medical isotope in the world and had been responsible for outstanding nuclear medical treatments in Australia and the rest of the world.