

Managing Nuclear Knowledge

IAEA Activities and International Coordination

The World Nuclear University: New Partnership in Nuclear Education

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New Partnership in Nuclear Education***



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FOREWORD

The important role which the IAEA plays in assisting Member States in the preservation and enhancement of nuclear knowledge and in facilitating international collaboration in this area has been recognized by the General Conference of the International Atomic Energy Agency in resolutions GC(46)/RES/11B, GC(47)/RES/10B, GC(48)/RES/13 and GC(50)/RES/13. A continued focus of IAEA activities in managing nuclear knowledge is to support Member States to secure and sustain human resources for the nuclear sector, comprising both the replacement of retiring staff and building of new capacity. The IAEA assists Member States, particularly developing ones, in their efforts to sustain nuclear education and training in all areas of nuclear technology for peaceful purposes, which is a necessary prerequisite for succession planning, in particular through the networking of nuclear education and training, including activities of the World Nuclear University (WNU) and the Asian Network for Education in Nuclear Technology (ANENT).

The report on the attached CD-ROM, *The World Nuclear University: New Partnership in Nuclear Education*, gives an overview of the history of the development of the World Nuclear University and related IAEA activities and contains an analysis and recommendations from the first WNU Summer Institute, held in 2005 in the USA.

The IAEA officers responsible for this publication were A. Kosilov, Y. Yanev and P.J. Gowin of the Department of Nuclear Energy.

EDITORIAL NOTE

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The World Nuclear University

The World Nuclear University is a global partnership committed to enhancing international education and leadership in the peaceful applications of nuclear science and technology. The central elements of the WNU partnership are:

- The global organizations of the nuclear industry: WNA and WANO;¹
- The inter-governmental nuclear agencies: IAEA and OECD/NEA;²
- Leading institutions of nuclear learning in some thirty countries.

The WNU was inaugurated in 2003 at a London ceremony commemorating the 50th anniversary of President Eisenhower's historic Atoms for Peace initiative, the visionary proposal that gave birth to the IAEA. That UN agency is one of the four world organizations known as the WNU's Founding Supporters. Within the UN system, the WNU is recognized as a Partnership for Sustainable Development by the UN Commission on Sustainable Development (CSD).

A non-profit corporation, the WNU pursues its educational and leadership building mission through programmes run by the WNU Coordinating Centre (WNUCC) in London. These cooperative activities are designed to harness the strengths of partnership members in pursuit of shared purposes.

Operationally, the WNU is a public-private partnership. On the public side, the WNUCC's multinational secretariat is composed mainly of nuclear professionals supplied by governments; the IAEA further assists with financial support for certain WNU activities. On the private side, the nuclear industry provides administrative, logistical and financial support via the WNA.

The Global Context: A Nuclear Partnership for a Nuclear Century

As today's global economy expands in pace with the explosion of the world's population and technological advances, the international community faces no greater challenge than to meet the imperative of sustainable development. Central to this challenge is the need to identify and deploy a mix of energy technologies that can propel global economic growth — and meet urgent human needs — without grievous and potentially catastrophic damage to the planetary environment.

With fossil fuel resources under pressure from scarcity and rising prices, and with scientific concern mounting over the dangerous health and atmospheric effects of carbon and other polluting emissions, major governments on every continent are reassessing the role of nuclear energy.

¹ World Nuclear Association and World Association of Nuclear Operators.

² International Atomic Energy Agency and Nuclear Energy Agency of the Organization for Economic Cooperation and Development.

Their analysis foresees a widening worldwide use of nuclear power in multiple clean energy roles: emissions-free generation of electricity, desalination of seawater to meet the global water crisis, and production of hydrogen and battery power for tomorrow's vehicles.

As a consequence, the preponderance of global population — in developed and developing countries alike, and including major nations not yet using nuclear energy — is now represented by governments that are affirming the central importance of nuclear power in their strategies for energy and environmental security for the 21st century.

This policy recognition — based on nuclear technology's demonstrated maturity as a safe, reliable and increasingly affordable source of primary energy — has spawned a global nuclear renaissance.

The prospect of a steady worldwide growth in the use of nuclear technology — for power generation and in a diversity of sophisticated applications in medicine, agriculture, and industry — points to the need for a greatly expanded global cadre of nuclear professionals in the 21st century. The role of the World Nuclear University partnership is to support this growth by:

- Strengthening education in nuclear science, engineering and law
- Promoting public understanding of nuclear technology
- Developing and inspiring a new generation of leaders for the nuclear profession.

Structure and Resources

WNU programmes are run from the WNU Coordinating Centre in London under the leadership of a Board-appointed President. The WNU President is John Ritch, WNA Director General, whose WNU work is a pro bono industry contribution to the WNU partnership.

Fundamental to the WNU partnership is the staffing of the WNUCC through the assignment by governments and leading companies of internationally experienced nuclear professionals. These experts fulfil a multiple purpose, by:

- Expressing a strong national commitment to the WNU's mission;
- Empowering the WNUCC with high quality cost-free staff resources;
- Facilitating WNU interaction with major national nuclear establishments.

As of the spring of 2007, the following nations had made secondment commitments to the WNUCC: Canada, France, India, Republic of Korea, Russian Federation, United Kingdom, and the United States of America (2). Discussions on this topic are under way with governments and leading nuclear enterprises in China

and Japan. An attractive concept, unfulfilled, is the placement on the WNUCC secretariat of regionally-supported representatives from Latin American and Africa.

The WNU Board is chaired by Z. Pate, WANO's Chairman-Emeritus, a leader widely respected for his pioneering work at the US Institute of Nuclear Power Operations and as a co-founder of WANO, the global nuclear safety organization.

During its start-up phase, WNU operations have relied on assigned cost-free staff and are designed to be largely self-financing. A key exception is financial support for certain WNU activities from the IAEA Technical Cooperation Fund, which has ensured strong participation from developing nations.

In a second stage, it is envisaged that the WNU agenda will expand to include an even more ambitious slate of programmes, to include the management of a major scholarship endowment financed by philanthropic contributions.

A WNU Chancellor and Vice-Chancellor provide leadership in specific WNU programmes and in building public support for the WNU agenda. The WNU's Chancellor is H. Blix, the IAEA's Director General-Emeritus, who headed that UN agency for 16 years and later served as chief of the UN Monitoring, Verification and Inspection Commission. The Vice-Chancellor is R. Hawley, former Chief Executive of British Energy.

WNU Programmes

WNU activities are designed to fulfil unmet needs on the transnational level and to capitalize on the wide ranging strengths and assets of WNU partnership members. These activities fall into six programmatic categories:

1. Facilitate multinational academic cooperation.

A primary WNU function is to promote international cooperation among institutions of nuclear learning through the sharing of courses, faculty, facilities and students. A related function is to ensure that nuclear education will meet the anticipated needs of the expanding global industry. The mandate of the WNU Academic Council, composed of leading nuclear educators and with industry representation organized by WNA and WANO, is to develop strategies to achieve these objectives. The Council will oversee a comprehensive WNU website to foster cooperation among educational institutions and also the placement of graduating students.

2. Build Nuclear Leadership.

The flagship of WNU programmes is the WNU Summer Institute. This unique six week course takes place in a different country each year, offering an inspiring career opportunity for some 100 outstanding young nuclear professionals and academics from around the world. The WNU-SI programme combines an extensive series of big picture presentations from world class experts with daily team building

exercises. In the process, WNU Fellows become part of a global network of future nuclear leaders.

Currently in planning are analogous leader building programmes for senior nuclear and regulatory executives:

- WNU Executive Seminars for Nuclear & Regulatory Leaders
- WNU Regulatory Leadership Seminars
- WNU Advanced Nuclear Management Programme.

3. Foster global consensus on future nuclear technology & multinational institutions

An inherent WNU strength is that the partnership spans the realms of government, industry, and academia. This strength will be employed in Programme 3: a seminar series designed to facilitate creative exchange — and consensus-building — on the global future of nuclear power. Participants in these candid off the record sessions will include policy makers, industry leaders and experts from many countries, who will convene to discuss current proposals to strengthen both the technological and institutional foundations of the rapidly expanding global nuclear industry.

4. Enhance public understanding

The WNU's status as a centre of objective expertise on nuclear science and technology offers important opportunities to disseminate authoritative information on crucial topics where public discourse is often fraught with myth and misunderstanding. These opportunities are being pursued in Programme 4 through three initiatives:

- A travelling one-day presentation titled “Nuclear Power Today” will describe, accessibly but in detail, how the global nuclear industry works.
- WNU Executive Seminars for Opinion Leaders will feature authoritative experts on topics of public interest and concern.
- WNU Secondary School Support will, in cooperation with national nuclear societies and drawing upon best practices in many countries, develop a training program for science teachers, along with highquality, universally translatable primer materials.

5. Shape scientific & regulatory consensus on issues affecting nuclear operations

The experience and expertise reposed within the institutions of the WNU partnership offer a unique opportunity to assemble the world's leading scientific and industry experts to review, with objectivity and balance, key issues that remain both contentious and of great import due to their effect on standard setting and regulatory practice. With a view to building an authoritative 21st century foundation for standards that are both sound and also facilitative of nuclear operations, WNU Scientific Sessions are envisaged on several significant topics, including:

- Low-Dose Radiation;
- Real Consequences of Nuclear Accidents;

- Emerging Regulatory Issues;
- Physical Protection of Nuclear Facilities.

6. *Strengthen international workforce professionalism*

Where opportunity arises, the WNU partnership will support and facilitate training that serves to enhance the professionalism of the global nuclear workforce. Two such initiatives are currently being developed:

- The WNU School of Uranium Production, hosted in the Czech Republic, is offering on-site courses both to miners and regulators
- The WNU Work Experience Programme will match promising graduate students with two to three month internship opportunities in key enterprises of the global nuclear industry.

WNU's Flagship: The Summer Institute for Future Leaders

The WNU's creation in 2003 represented only the initial gathering of good faith commitments — from a variety of inter-governmental, industry, and academic partners — to participate in activities still to be defined.

These commitments constituted an essential foundation, but the main task remained: to convert the WNU concept into a successful operational reality.

From the outset, a wide range of WNU activities was envisaged, but the compelling task in the start-up phase was to achieve an early and clear-cut demonstration that the WNU partnership could yield valuable innovative contributions to the world nuclear community.

The WNU Summer Institute was conceived and developed as this pilot vehicle.

With help from the US Department of Energy, the first WNU-SI was organized by the London-based WNUCC and hosted by the Idaho National Laboratory in July–August 2005. From an impressive field of applicants — mostly young professionals in nuclear enterprises — 77 WNU Fellows were selected, representing 34 nations.

The IAEA provided crucial support to facilitate the participation of WNU Fellows from developing countries.

The six week WNU-SI programme combined presentations from a series of world class experts with a challenging regime of small group exercises. The entire programme was overseen by a full time team of senior nuclear professionals acting as Mentors. The WNU's Founding Supporters — IAEA, WNA, WANO and NEA — provided many of the expert presenters.

This formula — and its execution — proved to an unqualified success, winning virtually unanimous praise both from the WNU Fellows and from the experts and Mentors who comprised the WNU-SI faculty.

With this momentum, the second WNU-SI was held in 2006 in Stockholm, hosted by Sweden's Royal Institute of Technology and the Swedish Centre for Nuclear Technology. Midway through the SI programme, France's Commissariat à l'Énergie Atomique (CEA) provided an extensive tour of French nuclear facilities. Again, the IAEA supplied key financial aid to developing country Fellows.

The 2007 WNU-SI will be hosted by the Korea Atomic Energy Research Institute (KAERI) in Republic of Korea. For this third Summer Institute, more than 100 WNU Fellows have been selected from some 35 countries. Once again, the IAEA role has been crucial in supporting WNU Fellows from the developing world.

The fourth WNU-SI will take place in Canada in July–August 2008, hosted and supported by a consortium of nuclear industry and governmental organizations.

By the completion of the 2007 WNU-SI in the Republic of Korea, some 270 young nuclear professionals from some 50 countries will have become part of a growing family of WNU Fellowship alumni, who are permanently networked through the WNU website (world-nuclear-university.org).

Beginning in September 2007, a yearly reunion will be held for former WNU Fellows in conjunction with the Annual Symposium of the World Nuclear Association in London, a leading event on the calendar of the global nuclear industry.

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