



## HEADLINES

### JAPAN

On March 11, 2011, the Tohoku-Taiheiyou-Oki Earthquake occurred near the east coast of Honshu, Japan. The magnitude 9.0 earthquake, which far surpassed previous post-1900 events and the subsequent tsunami, caused significant loss of life and damage. The members of WiN express their deepest condolences to the victims who have lost loved ones, homes, and businesses.

The multiple units of the Fukushima Dai-Ichi Nuclear Power Plant experienced severe damage during the catastrophe. WiN-Japan members, along with their colleagues are working tirelessly at the site and in their respective regions in Japan to fulfill their duties and address concerns from members of the public.

WiNners around the world are supporting our WiN-Japan colleagues in fulfilling the WiN mission to provide factual information on events to the public and media. The WiN Facebook page has been operating 24 hours 7 days a week to provide factual information and direction to respected sources of information on the events including:

The World Nuclear Association, WNA  
World Nuclear News, WNN  
International Atomic Energy Agency, IAEA

WiN-Japan recommends the following additional websites:

Tokyo Electric Homepage Tokyo Electric Homepage: <http://www.tepco.co.jp/en/index-e.html>

Tohoku Electric HoTohoku Electric Homepage: <http://www.tohoku-epco.co.jp/index-e.htm>

Japan Nuclear and Industrial Safety Agency: <http://www.nisa.meti.go.jp/english/index.html>

Atomic Energy Society of JapAtomic Energy Society of Japan: <http://www.aesj.or.jp/index-e.html>

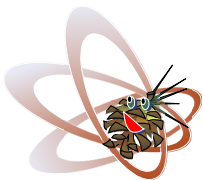


## INSIDE THIS ISSUE

- Read about WiN Russia's involvement in the Atomgrad contest, aimed at giving support to gifted children and to developing the young generation's positive attitude to nuclear energy. (see "What's New" on this page)
- Marija Miletic from the Czech Republic describes the VIND Serbia Clean up project at the Vinca Research Reactor in Serbia (turn to page 4).
- The Ghana Atomic Energy commission in collaboration with the University of Ghana and support from the International Atomic Energy Agency has established the Graduate School of Nuclear and Allied Sciences to train personnel for Ghana's nuclear practice power program and other related disciplines as well as train nuclear professionals for the African Region. The students from this school are trained on practical approaches to solving nuclear related problems. This kind of approach coupled with the support from both the Government and the IAEA can go a long way to prepare human resources needed to carry on with the operation of the present facility as well as the future nuclear power program of the country. There is also the Ghana nuclear society that has been inaugurated to sensitise the Government and the general public about the peaceful use of nuclear technology and its applications. This is done through symposiums, publication of journals and educational programs for basic and tertiary institutions. (read full details on page 6)
- WiN Korea really celebrated their 10th anniversary in style and produced an attractive 3D pop-up book to demystify nuclear for the young and not so young generations (read all about it on pages 9-11)
- How WiN Hungary successfully attracts young students – through sport. (Read more on page 11).
- WiN Canada participated in the Canadian Nuclear Association conference and celebrated the International Women's Day by contributing to a fund raising Dinner in support of women's rights to education, safety and health. (read more on page 12).
- WiN US creates a committee to support the soldiers serving in the US military. (For more information about their actions, turn to page 12).
- WiN Taiwan invites WiN Korea president and WiN Global Executive Byung-Joo Min to participate in activities promoting female scientists and engineers. (Turn to page 13 for further details).
- WiN Japan reached out to female university students to help them define which kind of information would be the most effective when communicating about the geological disposal of radioactive waste. (Read more on page 14).
- The round table and press conference organised to launch WiN Europe at this year's PIME event in Brussels was a great success. (Read more on page 15).



## WHAT'S NEW?



**We are the children of Atomgrad"**

**JSC "Concern Posenergoatom" and Leningrad Nuclear Power Plant announce the IX International Contest of Children's Creative Works "We are the children of Atomgrad" which will take place in the town of Sosnovy Bor Leningrad Region.**

In 2011 the Project "We are the children of Atomgrad" celebrates its 16<sup>th</sup> anniversary. Since its creation more than 7.5 thousand children from

Bulgaria, the UK, Germany, Lithuania, Russia, Ukraine, Finland and France have taken part in the Contest.

The objectives of the Contest:

- To give support to gifted children;
- To develop the young generation's positive attitude to Nuclear Energy and stimulate interest in Nuclear Industry professions.

The works presented to the Contest may include **painting and drawings** in any genre, **prose and poems, multimedia projects** as well as **pieces of applied art.**



***My father is an operator of Leningrad NPP  
(by Katya Golubeva)***



***Visit to Leningrad NPP  
(by Nastya Efremov)***

#### **Topics of the Contest in 2011:**

- “Galaxy of Peaceful Atom”. In 2011 we celebrate the 50th anniversary of the first manned space mission. It was Yuri Gagarin who overrode the Earth gravity on April 12, 1961 and became the first cosmonaut in the history of mankind. Everyone knows that the Atom and the Solar system are similar in structure, i.e. a nucleus in the centre (the Sun) and electrons moving around (planets). The Atomic and the Space branches are developing in synergy. What is the present and the future of these branches – how do you imagine them?. What is your view of the benefits that space exploration and the peaceful atom may yield to the mankind.
- “Native land, beloved forever”. People of various nationalities, we all live, study and work elbow to elbow in mutual respect, esteeming customs and traditions of each other. Folk holidays, games, ceremonies, arts enrich our life, our intellect and soul. They reflect traits and habits of nationalities, their sense of values, inherent concepts of courage and faithfulness. They represent observations of wildlife and weather lore inherited from generation to generation.

**Children and students who live in the towns near NPP are kindly invited to participate in the Contest.** The works are to be submitted from **March through April 15, 2011** and addressed as follows:

RUSSIA Leningrad Region 188540 Sosnovy Bor  
Leningradskaya st., 56a Modern Arts Museum of  
Sosnovy Bor

Contest “We are the children of Atomgrad”

The evaluation and selection will take place in April, 2011. The rewarding ceremony is scheduled for July, 2011 in the town of Sosnovy Bor, and will include the opening of the exhibition “We are the children of Atomgrad”. The winners will be awarded prizes and gifts, and will be invited to participate in social events.

Project Coordinator Ms. Nina Mishina

For further information please contact us at :

tel. + 7 813 69 5 57 26;

fax + 7 813 69 5 33 78, 2 31 48;

by e-mail: [ciso-mnv@laes.ru](mailto:ciso-mnv@laes.ru); [nimishina@yandex.ru](mailto:nimishina@yandex.ru)



## FEATURES

### VIND PROJECT (OR “CLEANING” UP SERBIA) Packing the spent nuclear fuel into SKODA VPVR/M containers at the RA reactor



Figure 1 RA research reactor

The Russian-designed heavy water-moderated research reactor at Vinča, jointly built by the Soviet Union and Yugoslavia, went critical in December 1959. The 6.5 MW heavy water moderated and cooled RA research reactor (Figure 1) located at the Vinča Institute of Nuclear Sciences near Belgrade in Serbia was in operation from 1959 until 1984. It initially operated on 2% low enriched uranium (LEU) fuel, but switched to high enriched uranium (HEU) (up to 80% in U-235 of uranium dioxide dispersed in the aluminium matrix) fuel in 1976 with the fuel supplied by the Soviet Union. In 1984, the RA reactor was temporarily shut down for reconstruction, but the project never materialized and the reactor consequently lost the operation license. In 2002, the Serbian government decided to decommission the RA reactor (hopefully this will not mean the end of “nuclear” in Serbia!) by setting up the Vinča Institute Nuclear Decommissioning (VIND) programme.

The 25 years of operation of the RA research reactor generated about 2.5 tonnes of irradiated (spent) nuclear fuel. Part of the fuel elements contained HEU leading to large proliferation concerns and consequently alarmed other countries to start solving this issue. In addition, about 30% of the spent nuclear fuel stored inside the spent fuel pool is leaking. (This can, among other issues, be the consequence of the limited Independent Serbian Regulatory body and the way they monitored, controlled and supervised reactor operation for decades). In all, 8 030 spent fuel assemblies (6 656 LEU and 894 HEU) are stored today in the spent nuclear fuel storage facility. Also, 480 fuel assemblies (FA) with fresh HEU stayed in

the reactor's dry core. Nevertheless these fuel elements were successfully transported to the Russian Federation in the year 2009. The design of the fuel elements is presented in Figure 2. The length of the FA is only 11.30 cm, diameter 4.04 cm with an aluminium cladding 1.3 mm thick.

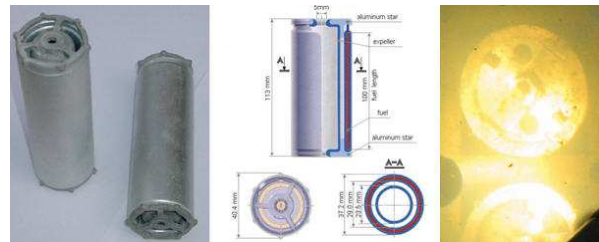


Figure 2 Fuel assemblies used inside the RA reactor and nowadays packed inside the barrels in the spent fuel storage pool (on the left)

The effort to clean up the Vinča site constitutes the IAEA's largest technical cooperation programme in terms of required funding, for which the Nuclear Threat Initiative (NTI) provided \$5 millions and the U.S. government another \$3 millions. In April, the European Commission (EC) agreed to provide \$8.6 millions for the implementation of the Vinča Institute Nuclear Decommissioning Program, which the Serbian government and IAEA are carrying out with support from the United States, Russia, EC, NTI and other partners. In September 2006, Vinča and the IAEA contracted a Russian consortium of the Sosny Research and Development Company, Tekhsnabeksport, and Mayak Production Association to repackage the fuel and prepare it for transport to Russian Federation.

Due to the poor condition of the fuel elements (leak, corrosion) they had to be repacked into specially designed penals (aluminium barrels and canisters) before final transport. Repacking of the fuel assemblies into canisters and barrels was a very serious and dangerous job with difficult manipulations (plasma cutting, decontamination of the metal components, transport) therefore special personnel training was mandatory. Before the repackaging started other technical issues also had to be solved at the reactor hall: improvement of structural stability of the reactor hall floor, the radiation monitoring system had to be improved together with the ventilation and gas monitoring systems, materials handling tools (cranes, forklifts etc.) were upgraded for planned manipulations. Consequently, during May and June 2010 all fuel assemblies were repacked in 30 stainless steel barrels and 250 stainless steel containers (different in length) and were waiting for the final loading in sixteen SKODA VPVR/M (Vyhořelé Palivo Výzkumných Reaktorů) and sixteen TUK-19 casks (Figure 3).

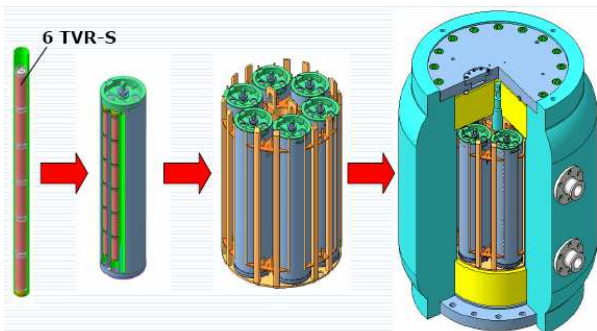


Figure 3 Procedure of repacking the fuel assemblies in AL-barrels and loading into SKODA casks

The removal of the spent nuclear fuel is currently ongoing and comprises a number of actions starting from the removal of spent fuel from the spent fuel storage facility, the packaging into proper shielding and transport containers, drying the containers and the final transport to Russian Federation. In order to transport the pencils from Serbia to Russian Federation, SKODA VPVR/M and TUK-19 containers (casks) are to be used. Half of the pencils that are present on the site were packed during August 2010 into twelve SKODA VPVR/M casks. Another four SKODA VPVR/M casks are to be loaded with fuel during October 2010 (since right are currently occupied in Belorussia). During September and beginning of October, 2010 sixteen TUK-19 containers are to be loaded with stainless steel canisters. After the loading of the TUK-19 and SKODA VPVR/M containers is finished, all containers will be sent together to Russia to the reprocessing facility of Mayak (scheduled to December 2010).

In order to load the SKODA VPVR/M containers with the RA reactor's untypical fuel assemblies, new baskets were designed and manufactured in Russia (presented in Figure 4). Each basket can support 6 aluminium barrels filled with fuel assemblies. Procedure of loading the container is relatively simple (in theory):

- The container is moved on the platform just above the water surface of the spent fuel pool
- The bottom part of the container is then pulled down into the pool together with the basket (Figure 4)
- The basket is loaded under the water with the six aluminium barrels (which contain spent fuel elements)
- The Basket is pulled up to the SKODA VPVR/M container and left for 12 hours to drain
- The SKODA VPVR/M container is then moved to the reactor hall where a special instrumentation for deep drying is connected. This procedure lasts longer than usually (for 14-20 hours) due to the untypical design and geometry of the fuel elements
- The SKODA VPVR/M container is then moved to the rotation frame where upper and bottom covers are put back in place and the container

can be tested for leaks (to be sure that radioactivity is not coming out from the container)

- Finally, the container is filled with the mix of Helium (50%) and Carbon Dioxide (50%)
- Each container is sealed with the unique IAEA seal and is then ready for transport

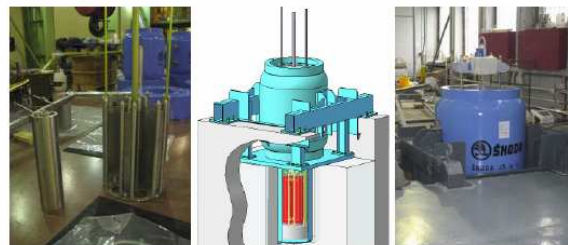


Figure 4 Loading of the barrels into the basket (right) and SKODA VPVR/M cask on the platform above the spent fuel storage

During the fuel loading all personnel showed very good manipulation skills (Figure 5) and awareness of the serious radiation situation and potential risks that can occur if the precise procedure concerning SKODA VPVR/M containers is not followed. Even though their skills satisfied all the NRI Rez criteria when manipulation with SKODA VPVR/M casks is concerned, it is not really advisable to leave personnel without supervision since in few occasions they needed to consult some experts about certain steps during loading, drying and manipulations in general.



Figure 5 Personnel on the platform above the spent fuel storage

When I left the RA reactor, I could see twelve SKODA VPVR/M containers loaded and sealed and arranged in a special order around the reactor hall waiting for four SKODA VPVR/M sisters and sixteen TUK-16 friends from Russia to arrive and to be loaded with the second half of the spent nuclear fuel (Figure 6).

At the end, more than 8 000 highly radioactive nuclear fuel elements arrived safely on 22 December to the Russian facility. Spent fuel transport included trains, trucks and ships in order to safely arrive to the Russian reprocessing plant of Mayak and as of today this project represents for IAEA one of the biggest shipments of spent nuclear fuel in the world.



Figure 6 IAEA seal on the SKODA VPVR/M container and loaded casks in the RA reactor hall

By Marija Miletic  
 Research Centre Rez Ltd.  
 Research Reactors Division  
 Czech Republic  
[mil@cvrez.cz](mailto:mil@cvrez.cz)

## NUCLEAR KNOWLEDGE MANAGEMENT IN GHANA

In the 1950s attention turned to the peaceful purposes of nuclear fission, notably for power generation. Today, the world produces as much electricity from nuclear energy as it did from all sources combined in 1960. Civil nuclear power can now boast of over 13,000 reactor years of experience and supplies almost 16% of global electricity needs, in 30 countries.

Many countries have also built research reactors to provide a source of neutron beams for scientific research and the production of medical and industrial isotopes.

Unfortunately, misconception about nuclear reactor safety has led several nuclear power projects to be abandoned [1].

Knowledge management focuses on people and organizational culture to stimulate and nurture the sharing and use of knowledge; on processes or methods to find, create, capture and share knowledge; and on technology to store and assimilate knowledge and to make it readily accessible in a manner which will allow people to work together even if they are not located together. People are the most important component in a KM system and the creation of new knowledge is one of its most valuable byproducts. For a KM system to function properly, the people involved must be willing to share and re-use existing knowledge and to cooperatively generate new knowledge to the advantage of the organization [2].

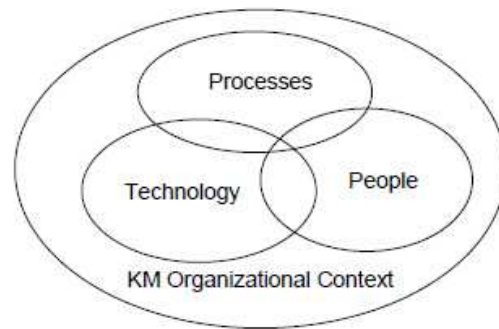


Fig1. The Organizational Context of Knowledge management

Knowledge management is quite a recent concept, having come to prominence during the 1990s. However, due to the nature of nuclear power plant operating organizations (high hazard but low risk), a number of plant activities and programmes have been in place throughout the industry to manage and control the knowledge and information related to nuclear power plant design, construction, operation and maintenance. Examples of such existing KM activities employed by NPPs (and, in most other NTFs - Nuclear Technology Facilities) include the following functions:

- Plant policies and procedures;
- Communication techniques;
- Configuration management;
- Document control;
- Work control systems;
- Quality assurance and quality management;
- Operating experience programmes;
- Corrective action systems;
- Safety analysis;
- Training and development;
- Human resource management;
- Company intranet and other web-based strategies.

The implementation of a KM system is not intended to replace any of these systems, but rather should increase the benefits to be derived from these systems in conjunction with the deployment of an integrated management system. If properly implemented, KM should not have to 'take over' existing NTF programmes or activities; to the contrary, KM should be a catalyst to increase the benefits to the organization of these activities. The lessons learned in the nuclear industry in the past 20 years in moving from inspecting quality through large quality assurance organizations to building quality into all facility processes have considerable relevance for KM implementation. The success of KM programs in NTF organizations should not be measured by whether or not there is a Chief Knowledge Management Officer or a large KM organizational unit. Rather, KM-related success should be determined based on whether KM ideas are a part of the daily life, practices and culture of NTF organizations; and, whether KM methods are

being used throughout the organization to enable NTF personnel to achieve safe, reliable, and cost-effective results. Therefore, the strategies of an organization must be considered as well as its objectives. Indeed, KM is itself an organizational strategy [2].

### THE GHANAIAN APPROACH

Ghana Research Reactor-1 (GHARR-1) is a Miniature Neutron Source Reactor (MNSR). GHARR-1 is a commercial MNSR reactor similar to the Canadian SLOWPOKE in design [1]. It is a 30 kW tank-in-pool reactor, producing a peak or maximum thermal neutron flux in the core and its inner irradiation channels of  $1 \times 10^{12} \text{ ncm}^{-2} \text{ s}^{-1}$ . The reactor is designed to be compact and safe and it is used mainly for Research and Development in reactor and nuclear engineering, neutron activation analysis, production of short-lived radioisotopes, human resource development for Ghana's nuclear power programme and for education and training. It is cooled by natural convection and moderated with light water. Ghana has operated her miniature neutron source reactor without any reportable incident in the past fifteen years. This is due to several safety precautions that are adopted at the centre.

Ghana therefore has to consider the nuclear option in her energy mix for its economic competitiveness and environmental friendliness. It does not produce greenhouse gases and other pollutants. There is therefore the need to include nuclear power in Ghana's energy mix for sustainable, reliable, affordable and continuous power supply. In order to Move Ghana's economy forward and to achieve a middle-level income status by the year 2020, it will require improvement in living standards of her people, industry and other economic activities. This will definitely require a high increase in electricity generation increased in generation of electricity from all hydro sources is limited to 1,200 MW.

### HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING

In Ghana, the School of Nuclear and Allied Sciences (SNAS) jointly established by the University of Ghana (UG) through the agency of the Faculty of Science and the Ghana Atomic Energy Commission (GAEC) and in co-operation with the International Atomic Energy Agency (IAEA), Vienna, offers accredited Master of Philosophy (M.Phil.) and Doctor of Philosophy (Ph.D.) programmes in the following areas of specialisation:

1. Applied Nuclear Physics
2. Radiation Protection
3. Environmental Protection
4. Nuclear and Radiochemistry
5. Nuclear Engineering
6. Nuclear Agriculture
7. Radiation Processing

**The main objectives of the school, among others, are:**

- i. To undertake postgraduate programmes in nuclear Sciences and Technology leading to the award of M.Phil. and PhD degrees of the University of Ghana.
- ii. To popularize nuclear Science and Technology programmes to attract high undergraduates.
- iii. To engage in the hosting of AFRA and IAEA regional and inter-regional training courses/workshops, other international conferences/Seminars, and the conduct of research in the peaceful uses of nuclear and biotechnology techniques in Ghana and Africa as a whole.
- iv. The research areas to be covered include: Health and Nutrition, Agriculture, Industrial and Environmental sectors as well as Waste Management.
- v. To create international links with other Institutions with a tradition in nuclear education and research (such as the Institute for Advanced Studies of the University of Pavia, Italy, Nuclear Training Centre of South Korea, and the World Nuclear University, UK) for exchange of programmes and sharing of experiences.

The following can be considered at this point:

- To make the nuclear profession attractive and competitive (incentives, reducing risk)
- Vibrant regulatory and legal framework that will ensure worker confidence and eliminate fear of workers.
- Organising training workshops for professionals to upgrade and share knowledge.
- Developing and Manufacturing inherently safe reactors.

### NATIONAL COMMITMENT

**What is being done, and what should be done, to further the public confidence and governmental support which will facilitate investment?**

Dr Duffuor, the finance minister of Ghana in his 2009 budget presented to parliament on the 10<sup>th</sup> march 2009 indicated that Ghana will increase her power generation capacity to 5,000 MW in the medium term. Frost and Sullivan also stated in July 13, 2009 that by 2014 the country will require an additional electricity generation capacity of 2,000 MW. The director-General of the Kofi Annan Centre of Excellence in ICT, Dr Dorothy Gordon, said the IAEA recognised the need to further master the potential of nuclear analytical techniques. According to her, it was in view of this that IAEA, in

---

collaboration with some African consultants, had developed an educational tool in nuclear analytical techniques in the form of e-learning ICT materials. Dr Gordon explained that the objective of the course was to train experienced professionals of the participating African countries in effective use of ICT based teaching materials for nuclear analytical techniques. She said during the training course the participants would learn how to use the developed ICT materials in nuclear analytical techniques and integrate them into their national nuclear programmes. The Director-General of the Ghana Atomic Energy Commission, Prof. E.H.K Akaho, said the course was to ensure that nuclear science was promoted in Africa. There is the need for more scientists to get involved in politics in order to push for the enactment of the regulatory law for the operation of nuclear power plant to come to being in Ghana. The Strategic National Energy Plan has stated that Nuclear Electricity Generation is one of the options for the long-term needs of Ghana. Present Government has requested Energy Commission to be responsible for the implementation of the Nuclear Power programme. GAEC as the National Nuclear Research Institute is also to advise Government of Ghana on all matters of nuclear energy. [5]

#### **PRESIDENTIAL COMMISSION ON NUCLEAR POWER DEVELOPMENT (PCNPD)**

PCNPD shall consist of representatives of the following Institutions:

- Energy Commission
- Ghana Atomic Energy Commission
- Ministry of Energy
- Attorney General and Ministry of Justice

#### **Ministry of Finance**

The PCNPD is to be charged with the following responsibilities: Drafting of Nuclear Power Policy, Identifying all the infrastructural and other elements and Planning the implementation of the Policy, in line with the three phases of IAEA milestone document, phase 1: Preparation to launch a nuclear power programme, Phase 2: Preparatory work for the construction of a Nuclear Power Plant after a policy decision has been taken. Phase 3: Activities to implement a first Nuclear Power Plant

#### **ADHERENCE TO OTHER INTERNATIONAL INSTRUMENTS**

Memoranda have been prepared on the following Conventions and Treaties for consideration of Cabinet and Ratification or accession by Parliament:

- Amendment to the Convention on the Physical Protection of Nuclear Material (CPPNM)
- The Convention on Nuclear Safety
- The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

#### **OTHER RELEVANT INTERNATIONAL LEGAL INSTRUMENTS**

Draft Memos on Convention on Early Notification of a Nuclear Accident, Convention on Assistance in the case of Nuclear Accident or Radiological Emergency, Vienna Convention on Civil Liability for Nuclear Damage and Protocol to amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage and Convention on Supplementary Compensation for Nuclear Damage have all been prepared.

**The Ghana Nuclear Society (GNS)** is a non-profit organization that advocates the introduction of nuclear energy in Ghana. The GNS is head quartered at the Ghana Atomic Energy Commission (GAEC). With the establishment of the Ghana Nuclear Society, Ghana has joined the league of countries with national nuclear society. The current national president is Prof. John Justice Fletcher. The society is not for science inclined persons alone

The Ghana Nuclear Society received its certificate of incorporation on 13 May, 2008. The society, which operates under the motto "Nuclear for Sustainable Energy Development," has an eight-member Advisory Panel that consults with the Board of Directors, which is made up of 13 persons and four members from the National and Student Chapter Executives.

The society has created public information programs on nuclear matters, and it has produced seminars, educational outreach programs and interactive media presentations on local radio and television stations. It also publishes a newsletter that outlines issues relating to nuclear energy.

#### **Upcoming Events**

2010 Conference "Energy Security for Accelerated Development of the African Region

To enhance public acceptance and awareness of the Nuclear Power Option, the society is organizing a three-day conference under the theme: "Energy Security for Accelerated Development of the African Region". This conference hopes to promote the acceptance of the Nuclear Power Option on the continent by bringing together Nuclear Power Vendors, Reactor Manufacturers, Scientists and Experts in the nuclear field to come and share their vast knowledge and experience with the participants from the African Region.

GNS has been organising educational programs at the SAMBEL Academy, GAEC and at primary schools located near the Graduate School of Nuclear and Allied Science at Atomic, Kwabenya.

#### **BUILDING BILATERAL/INTERNATIONAL NETWORKS AND PARTNERSHIPS**

Ghana is likely not to be involved in fuel enrichment and reprocessing of spent fuel. The country could seek reliable fuel supply arrangements through bilateral or international agreement and enhance existing mechanisms for coordination and information exchange with IAEA Member States

and other international organizations for safe and secure operation of Nuclear Power Plants

Peer reviews

- Networks or Partnership with Institutions such as:
- Global Nuclear Energy Partnership (GNEP)
- World Association of Nuclear Operators (WANO)
- International Atomic Energy Agency (IAEA)

### INTERNATIONAL NETWORKING

To strengthen the education and training of students of SNAS, the International Atomic Energy Agency is providing equipment for development of institutional capacity and facilitating networking with renowned nuclear institutions such as the European School of Advanced Studies on Nuclear and Ionizing Radiations Technology, TNRI of the University of Pavia, Italy, the International Centre of Theoretical Physics, ICTP, Trieste, Italy and the World Nuclear University, WNU, UK.

### CONCLUSIONS

A continuous learning environment has been created by the establishment of the school of nuclear and allied science to manage nuclear knowledge and to educate the public on the activities of the nuclear industry through the Ghana Nuclear Society. With support from the government and other international collaborators, nuclear knowledge management is going to be much easier and well establish in Ghana and the rest of Africa.

### ACKNOWLEDGEMENT

We thank the Almighty God for giving us life and the will power to finish the work, the second thanks goes to the director general of GAEC, Prof. E.H.K Akaho for his support, not forgetting Emmanuel Ampomah Amoako, Rex Abrefah and all the staff of the National Nuclear Research Institute.

### REFERENCES

- [1]. AKAHO, E. H. K., ANIM-SAMPONG, S., DODOO-AMOO, D. N. A., MAAKU, B. T., EMI-REYNOLDS, G., OSAE, E. K., BOADU, H. O., BAMFORD, S. A., Safety Analysis Report for Ghana Research Reactor – 1, GAEC-NNRI-RT-26, March 1995.
- [2]. <http://www.world-nuclear.org/info/inf01.html>
- [3]. [http://en.wikipedia.org/wiki/knowledge\\_management](http://en.wikipedia.org/wiki/knowledge_management)
- [4]. Ghana Newspaper, Daily Graphic, Tues, 03 June 2008.
- [5]. ANSTO, 1994, The Safety of Nuclear Power Reactors, Nuclear Services Section Background Paper

By:

\*E. Mensimah, \*\*R.B.M Sogbadji, , B.J.B Nyarko  
*National Nuclear Research Institute, P. O. Box LG80, Legon, Ghana.*

E-mail: [\\*lauraadinyira@yahoo.com](mailto:lauraadinyira@yahoo.com),  
[\\*\\*robertmawuko@yahoo.com](mailto:robertmawuko@yahoo.com),



**THE WORLD OF WIN**

**WiN KOREA**

### 2010 Board Meeting of WiN-Korea

The 2010 Board Meeting of WiN-Korea was held at Ariban in Seoul, on October 26th, 2010.



The meeting was attended by 13 Board members, including Hong Seong Woon (Chairman of the Board) and Park Se-moon (President of WiN-Korea). The agenda included reports of the results of decisions taken during previous regular and extraordinary board meetings, items for decision and a task report. The 2010 financial accounts and 2011 budget were voted. All bills regarding the president, chairman of board, the committee of inspection, the board of directors, the project for scholarship, and the revision of the articles of association for the next term, were passed as proposed. The president and the chairman have been reappointed and new members were elected as board members.

### Press Conference to present an educational 3D Pop-up Book



The Educational 3D book for children, "Green Energy for Green Earth" published by WiN-Korea was presented to the press (8 newspapers, including 'Energy Economy' (1 Oct.), 'E2 News' (1 Oct.), 'Energy Daily' (4 Oct.), 'Energy Times' (4 Oct.), etc.) The press was eager to discover the

book because it is the first visual 3D book in the nuclear energy field. They say that, given the current lack of books for children about nuclear energy, it will be a good educational support for both adults and children due to easy and familiar contents rather than difficult concepts in nuclear energy.

### WiN-Korea Holds 2010 General Assembly and an Event to Commemorate its 10TH Anniversary



The combined 10th general assembly and the 10th anniversary event was successfully held to celebrate the 10th anniversary of WiN-Korea's establishment with the presence of over 80 WiN-Korea executives and members under the support of Korea Atomic Energy Research Institute (KAERI). It took place on 11th Nov. 2010 at the Riviera Hotel in Daejeon, Korea. President, Se Moon Park, emphasized "if the first 10 years were the time of growth, we will make the upcoming 10 years the term of maturity". In her greeting, she said "I pay my respects to WiN-Korea members for leading the myriad projects necessary for nuclear-power development while they were fulfilling their duties in the workplace and the family at the same time".

Subsequently, Myung-Seung Yang, the president of KAERI, and Sang-Ku Chang, the president of Korea Institute of Nuclear Non-proliferation and Control (KINAC), asked WiN-Korea to lead the efforts to bring women nuclear experts to the forefront while congratulating WiN Korea on its 10th anniversary. Letters of thanks were presented to the attending presidents of institutes as a token of gratitude for their continued support in the creation and development of WiN-Korea.

A special lecture was given with the title of 'Successful Leadership through Humor' (lecturer: Eun-Ok Park) maintaining that staying mentally active and a sense of humour can make for a successful life.

In this general meeting, there was full approval for the following: reappointments of Se-Moon Park as the next president and Seong-Woon Hong as the next board chair, appointments of auditors and board members, 2009 closing accounts, 2010 provisional accounts, a revision of the articles of association, and a plan of encouragement for students with scholarships. After the meeting, WiN-

Korea members performed voluntary community service at the National Cemetery in Daejeon by cleaning stone monuments, removing wilted flowers, and picking up litters. The event was reported by five media agencies including 'Today Energy'.

### 2010 Symposium on Nuclear with Women held in great success



The "2010 symposium on Nuclear with Women", organized by WiN-Korea, was held in great success at the

National Assembly Hall on 19th August to celebrate the tenth anniversary of the founding of WiN Korea. The symposium was programmed in two sessions; firstly a series of lectures led by experts and secondly the awards ceremony for the "Nuclear, the green energy UCC" contest organized by WiN-Korea.

The symposium was jointly hosted by the Digital Forum of the National Assembly and it was attended by many distinguished guests and speakers including the chairman of the Digital Forum of the National Assembly, congressmen, the chairperson of Korea Nuclear Energy Promotion Agency (KONEPA), and president of Korea Institute of Nuclear Nonproliferation and Control (KINAC). The symposium had a great turnout of about 230 attendees including WiN-Korea members, Daegu Health college students, Ewha Womens' university students, their parents, members of Women associations who understand nuclear energy, members of the Consumers Union of Korea, representatives from nuclear-related industries, and the press.

The symposium started with an opening remark by Dr. Se-Moon Park, the president of WiN-Korea and continued with welcome speech given by Dr. Sangkee Suh, the chairman of the Digital Forum of the National Assembly. The first session was introduced by Dr. Rena Lee and there were three presentations. The first lecture was presented by Dr. Joonho Oh from KAIST on 'Robot Technology and Future', followed by the second lecture on 'Nuclear Energy and Robot' given by Dr. Seungho Kim, the senior research scientist of Korea Atomic Energy Research Institutes (KAERI), and lastly the lecture on 'Understanding and Appreciation of X-ray Art' given by Dr. Taesup Jeong, the professor of Yonsei Univ. college of medicine.

During the second session, an awards ceremony for the contest winners was hosted by Mr. Sungjoo Kim, who is the honorary ambassador for WiN-Korea and a very well known TV program master.

This symposium received intensive media attention because it provided an opportunity to share the latest information on nuclear energy and radiations. Moreover, it was broadcast through the television of the National Assembly:

[http://www.assembly.go.kr/renew09/brd/com/pop\\_vod.jsp?infold=3048&programId=5&proInfold=8452](http://www.assembly.go.kr/renew09/brd/com/pop_vod.jsp?infold=3048&programId=5&proInfold=8452)

The symposium contributed greatly to enhance the familiarity of the attendees with nuclear energy.

**Award Ceremony for the “UCC contest with WiNK for Green Energy Nuclear”**



The award ceremony for the ‘UCC contest with WiNK for Green Energy, Nuclear’ was hosted by a spokesperson of WiN-Korea, Mr. Sungjoo Kim.

Dr. Yoonsil Lee, the vice president of WiN-Korea introduced the review process briefly and praised the creativity of the participants.

Through the three screening processes, nine teams were shortlisted for awards winners among more than 30 teams. A total of 4 million Korean won was awarded as a cash prize. Two foreign students jointly won the grand prize in the contest and took a cash prize of 1 million Korean won. Miss Ryoe Kim from China and Mr. Richard Moore from the USA received the grand prize with the title ‘Talk about atomic power’. They were students from China and America. Their work of using graphics to demonstrate the difference between nuclear energy and nuclear weapons and caught the audience’s full attention.

**WiN-Korea’s special publication with “10-year History of WiN-Korea”**



WiN-Korea has published a book called “10-year history of WiN-Korea” as a part of celebration its 10th anniversary. The main part of the book contains 10 years of footprints by showing pictures, and various activities including

the participation in the WiN-Global Annual Conference.

In the appendices, there are articles for press releases, E-news and WiN-Korea’s constitution.



WiN-Korea would like to thank those who expressed their

congratulations for the book; Dr. Sang-Kee Suh, a member of National Assembly, Dr. Ju-Ho Lee, minister of Ministry of Education, Science and Technology, Mr. Jong-Shin Kim, President & CEO of the Korea Hydro and Nuclear Power Co., Ltd, Dr. KunMo Chung, former minister of Ministry of Science and Technology, Dr. Gil-ja Jeon, President of the Korea Federation of Women’s Science and Technology Associations, Ms. Cheryl L. Boggess, President of WiN-Global and Dr. Irene Aegerter, the first president of WiN-Global. Besides, WiN-Korea also extends its gratitude to the WiN representatives of each country including Dr. Gabriele Voigt for their congratulatory messages.



There is no doubt that the book will serve as a guidebook for the future, and will help the members or future members to have a better understanding of WiN’s activity and vision.

**WiN Hungary**

**Sports events – a way to engage students to the WiN cause**

A tournament of street ball for students was conducted on 04th of December 2010 in the Sports Hall of Hristo Botev Secondary School. More than 80 enthusiastic young people from different schools in the town of Kozloduy took part.

The sponsors of the tournament were the association of The Women in Nuclear Industry - Bulgaria (WiN-Bulgaria) and the Basketball section of the Physical Culture, Sport and Tourism club at the Kozloduy Nuclear Power Plant.

The young sportsmen and sportswomen were divided into three groups according to their age: 5th -7th grade, 8th -10th grade and 11th -12th grade, and each team included three competitors.

The tournament was very exciting and all the participants were willing to win.



WiN-Bulgaria and Kozloduy NPP Plc provided the awards for the winners– sports articles.

The sponsors, organizers and all the participants stated their intention to turn this Street ball tournament into a tradition.

## WiN CANADA

### WiNners staff WiN-Canada booth and attend Canadian Nuclear Association conference in Ottawa, Ontario

WiNners from across the Canadian nuclear industry attended the Canadian Nuclear Association (CNA) conference in Ottawa on Feb. 23-25, 2011. Prior to the opening reception of the conference WiNners gathered together to talk about WiN-Canada's many accomplishments over the past year and to look ahead at the events and activities for 2011. WiNners left the meeting armed with the information needed to get the word out about WiN while networking with conference delegates.

WiN-Canada also staffed a booth at the conference to speak with current members, recruit new members and chat with industry leaders about the great work WiN is doing. Approximately 800 members of the Canadian nuclear industry attended the conference.



### WiN-Canada members celebrate 100<sup>th</sup> anniversary of International Women's Day

Members of WiN-Canada celebrated the 100th anniversary of International Women's Day, with more than 500 other participants on March 3, 2011. The dinner event hosted by Women of Halton Action Movement and Zonta of Oakville, raised funds for Sexual Assault and Violence Intervention Services of Halton and to Canadians in Support of Afghan Women.

The keynote speaker was Dr. Samantha Nutt, War Child Founder and Executive Director, a humanitarian activist and leader. Dr. Nutt, also on staff at Women's College Hospital in Toronto, spoke about her experiences and revelations working with women and children in Africa and Asia. The audience was inspired by Dr. Nutt's talk which reinforced the women's right to education, safety and health.



## WiN US

### Supporting Troops and Patriotism Committee

In 2010, President Vivian Wagon, propositioned the STPNOC WIN Executive Board to start a new committee whose purpose would be to honor family members of our employees who are actively serving in the United States Military. After gaining their approval, committee volunteers were sought among the WIN membership.

The committee chose the name, Supporting Troops and Patriotism. Two fundraisers were held during the year. Both involved selling patriot ribbons/buttons to employees for \$5/each where the employee would then be allowed to wear blue jeans to work for a week. The first jean week was July 4th week and the second was Veterans Day week.



Scouts and Leaders of Bay City Boy Scout Troop 45 worked to place 700 flags along the STP Access Road. Pictured from front left: Scout William Billings, Assistant Scout Master Mike Whitley; back row: Assistant Scout Master Mike McGehearty, Assistant Scout Master Ed Payne. Not Pictured: Scout Master Tim Graud, Assistant Scout Master Dewayne Billings, Scout Zech Payne, Scout Ian Whitley, Scout Brian Whitley.



*Flags along the STP Access Road Placed Bay City Boy Scout Troop 45*

The committee wanted to honor our employees' military family members by creating a Patriot Wall in each of our cafeterias, one which is located inside the Protected Area (PA) and one outside the PA. A 5x7 photo of that soldier was hung with a plaque designating his/her name, branch and STP employee family member. The Bay City VFW donated 2 3x5 United States flags to hang on the walls. The Patriot Wall outside the PA was unveiled on Veterans Day, November 11th. Our WIN President (Vivian Wagnon), a VFW member (Willie Greer), and a member of our Senior Management Team (Tim Powell, VP Tech Support an Oversight) spoke at the ceremony. Following the opening speeches, cake and punch were served to those employees in attendance.



*Patriots Wall in the NSC at STP*

Also as part of the Veterans Day celebration, the committee bought flags to line the plant entrance for each ribbon/button sold. The committee solicited the Bay City Boy Scouts who graciously volunteered their Saturday to stake about 700 flags along the entrance road to the plant. The flags were displayed during the Veterans Day work week and honored not only those actively serving our county but the many veterans employed at STP today.

The committee decided to send two care packages to the soldiers per year, the first being a Christmas package and the second would be a birthday package. We asked the WIN membership to donate specific items for the Christmas packages. The response was overwhelming and only a few additional items had to be purchased. Volunteers gathered at lunch to put together 36 packages. A local elementary Catholic school, Holy Cross, kindly agreed to make homemade Christmas cards to include in the boxes. The feedback received from some of the soldiers was that the kids' Christmas cards were the best part of the package. Fundraising money was used to pay for postage to mail the boxes.



*WIN members pack donations into Christmas Boxes for Soldiers. Members pictured from left are Tammy Jacobs, Wendy Hoffman, Minnie Gonzales, Patti Ragsdale and DeDe Powell.*

In 2011, STPNOC WIN will continue to recognize those honored soldiers we call family by sending birthday and Christmas packages to each of them who give so much to us each day.

## **WIN TAIWAN**

### **WIN Taiwan Invites WIN Global Executive Byung-Joo Min to Participate in Activities Promoting Female Scientists and Engineers**

Dr. Byung-Joo Min, President of the Association of Korean Woman Scientists and Engineers (KWSE), visited Taiwan during 9-12 December, 2010 and took part in a series of activities associated with promotion of women in science and technology fields. The visit of B.J. Min, who is also WIN Global Executive and former Vice President of the Korea Atomic Energy Research Institute, was initiated by WIN Taiwan and invited jointly by Prof. Chia-Li Wu, founder of the Taiwan Female Scientists and Technologists MentorNet and editor-in-chief of its E-Newsletter, as well as by Prof. Y.M. Hsu, organizer of the National Conference on Female Scientists.

Dr. Min started her trip by visiting the Institute of Nuclear Energy Research upon landing at Taoyuan, followed by an official visit at the Atomic Energy Council where she also had a networking

meeting with representatives of the local WiN chapter in Taipei.



*Byung-Joo Min was greeted by Chuen-Horng Tsai, Chairman of the Atomic Energy Council (above), and networked with representatives of WiN Taiwan (below).*



As a keynote speaker at the National Conference on Woman Scientists held in Taichung, B.J. delivered her speech entitled "New Paradigm for Korean Science and Technology Development, Role of KWSE". The conference was expected to encourage women to break gender barriers and pursue self-fulfillment. Aspiration, commitment and accomplishment are three major themes in this Conference, which attracted over 200 participants. Most of them were women and over half were high school and college students.



*Young participants lined up to get an autograph from Dr. Min after her keynote speech at the National Conference on Female Scientists.*

A seminar with roundtable discussion was held at the Center for Condensed Matter Sciences of the National Taiwan University where Dr. Min gave a presentation "Networking and Accomplishments of Women Scientists and Engineers in Korea". The discussion was focused on various details and challenges of founding and operating a female scientists and engineers organization such as

KWSE with the hope that the Taiwan Female Scientists and Technologists MentorNet may become a formally registered organization in the near future.



*Dr. Min shared her experience in leading the Association of Korean Woman Scientists and Engineers with Taiwan's female scientists.*

This was the second time WiN Taiwan invited WiN Global executives to take part in its local activities. The first time was for the Symposium on Communication of Nuclear Issues, where Drs. Irene Aegerter and Se-Moon Park were invited as guest speakers (see Issue 19 of WiNFO for details).

## WiN JAPAN

### Science Dinner in West Tokyo Eye Opening for Female University Students

On January 12th, WiN-Japan held a Science Dinner in West Tokyo. The purpose of the Science Dinner is to educate university students in the style of a "Science Café". The Science Dinner consisted of a series of lectures and a dialogue session with the students. WiN-Japan gave lectures about "Japanese condition in energy", "The mechanism of a nuclear power plant and its safety", "Radioactive waste", and "Radiation", and then held a dialogue session with university students to discuss on energy and nuclear power. Today's university students never learned about nuclear energy when they were elementary or junior high school students. WiN-Japan expects university students to have the ability to think about energy resources by themselves and the ability to decide how to solve energy issues with precise knowledge. Especially female university students will have to educate their own children to use energy wisely taking into account the limited energy resources in the coming years. WiN-Japan gives useful information to them to reflect on the issue without being misled by media reports.

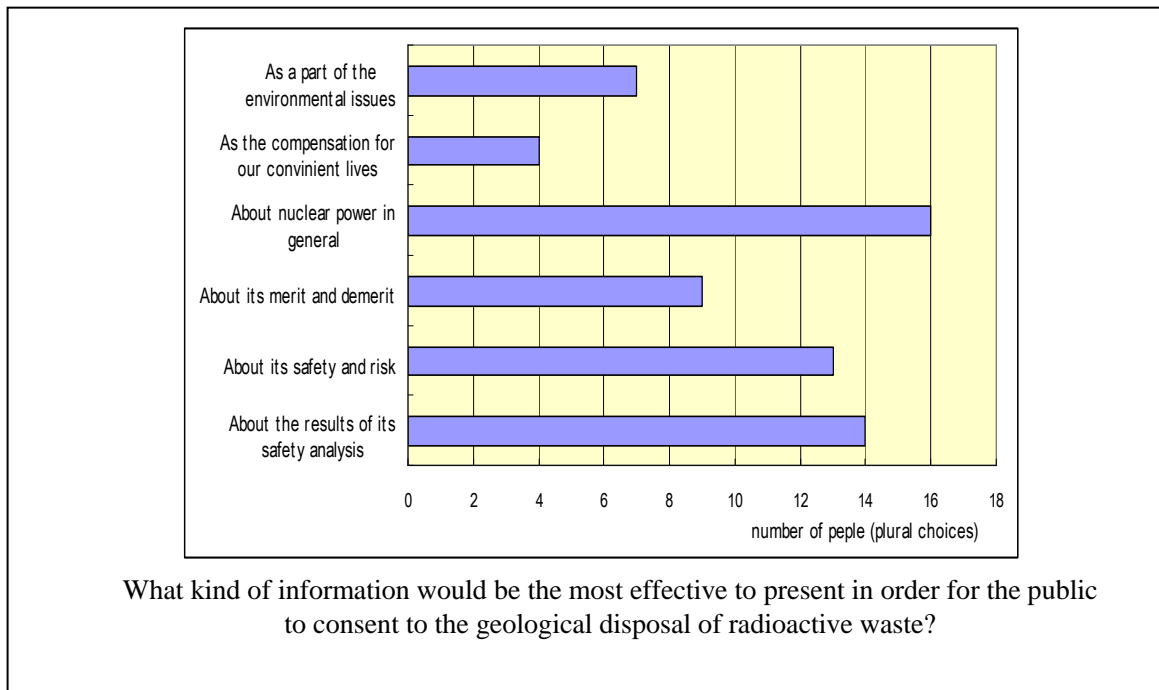
WiN-Japan has the habit to give out questionnaires after Science Dinners to obtain evaluations. The evaluation this time was that more than 70% of the attendants understood all lectures very well, 30% understood somewhat, and 0% did not understand at all.

Also in the questionnaire, WiN-Japan asked, "What do you think creates differences between what experts define as safety and what the public interprets as safety?" The answers were: "The media", "Lack of education", "Difficult language used by experts", and "Experts design as a whole, including "the future, while citizens think in terms of their present life."

To the question, "What kind of information would be the most effective to present in order for the public to consent to the geological disposal of radioactive waste?" the answers were as below (23 participants answered the question):

The results of the questionnaire showed that the most effective kind of information would be general information about nuclear power to the public. This means students thought that not only information about the safety and risk of geological disposal is necessary, but also general information on nuclear power in order for the public to consent to geological disposal. They may think that information outlets for nuclear power are not sufficient.

WiN-Japan, therefore will continue to inform university students in the style of Science Dinners in many places in Japan. WiN-Japan plans to host three Science Dinners in the next fiscal year.



## CELEBRATING SUCCESS

### WiN Europe declares its ambitions at its successful launch event organised at PIME in Brussels, February 2011

On 13 February 2011 in Brussels, at the opening of the PIME conference – essential meeting-place for all communicators in the nuclear industry – organised by ENS, a very successful meeting marked the official launch of WiN (Women in Nuclear) Europe.

170 guests enjoyed this event led by Dominique MOUILLOT, President of WiN Europe. A short, amusingly informative video was shown, illustrating the way in which young people perceive nuclear, as well as the professions and career opportunities available in the sector. This provided the

springboard for a lively debate amongst our notable participants: members of the European Commission and Parliament, Edit Herczog, Ute Blohm-Hieber and Elena Dumitru; Claudine Hermann, vice-president of the European Platform for women in science; and Andrea Bachrata, representing the younger generation, researcher at IRSN.



WiN Europe is responding to a real need and has much to do in the fields of communication, education, training, the updating of skills and the transfer of knowledge. Its work will affect the promotion of diversity and equal opportunities in scientific and technical fields, especially in the nuclear sector. WiN Europe will play a key role in the development of solutions to meet the current and future energy challenges of Europe (updating of skills, acceptance by the general public, etc.).



Following the launch event, organisations such as the ENS, the OCDE/NEA, the ENELA the ENEN, the CEA, ANDRA and COFREND expressed their desire to collaborate with WiN Europe and cooperation agreements are currently being prepared. We have received financial support from GDF-Suez, Kaefer-Wanner, AREVA and Delta Assurances. And finally, WiN Europe has begun the process of becoming recognised as a non-governmental organisation by the IAEA and the ENEF.

WiN Europe would like to express its sincere gratitude to Cheryl Boggess, WiN Global President, for her presence at this event.

IAEA: International Atomic Energy Agency ENS: European Nuclear Society OCDE/NEA: Nuclear Energy Agency of the Organisation of Economic Cooperation and Development ENELA: European Nuclear Energy Leadership Academy ENEN: European Nuclear Education Network ENEF: European Nuclear Energy Forum)
---

Contact WiN Europe:  
Sophie Prévot, General Secretary  
Tel.: +33 4 91 29 18 03 –  
e-mail: [contact@win-europe.org](mailto:contact@win-europe.org)



## PERFORMANCE METRICS

The WiN Executives and Board have established participation measurements for the WiN Leadership of 90% for the Executives and 75% for the Board. Participation includes meetings, conference calls, votes, and requests for information or other similar items. These measures are based on the following criteria:

- Direct participation
- Participation of a previously identified alternate
- Providing inputs on agenda items prior to the meeting

The WiN President is responsible for identifying items to consider in tracking and publishing the results on a regular basis. The items selected must align with WiN strategic goals. A report on metrics will be provided in the General Session in May.



## MARK YOUR CALENDARS

**19TH ANNUAL MEETING OF WIN GLOBAL**  
WiN-Bulgaria is pleased to announce the 19th Annual meeting of WiN-Global.



**WiN-Bulgaria**

Association of Women in the nuclear industry - Bulgaria



**global  
WiN**  
Women In Nuclear



# NUCLEAR TECHNOLOGIES – TO BUILD A BETTER WORLD

*19<sup>TH</sup> WIN GLOBAL ANNUAL INTERNATIONAL  
MEETING*

*6 – 10 June, 2011*

*“Riviera” Holiday club, Varna, Bulgaria*

under the patronage of:

The Minister of Economy, Energy and Tourism of the Republic of Bulgaria

Bulatom

BNRA

Kozloduy NPP Plc.



**WiN-Bulgaria**

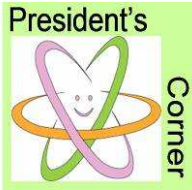
Association of Women in the nuclear industry - Bulgaria



**global  
WiN**  
Women In Nuclear

additional information and registration please visit: [www.win-bulgaria.org](http://www.win-bulgaria.org).

For



Dear WiNners,

We join in underscoring our heartfelt sympathy for the people of Japan in their struggle to emerge from this horrific natural disaster.

Because events at the Fukushima nuclear plant have caused concern and confusion, now is an important time for WiNners to use our network to communicate factually on what has occurred.

We recommend that you draw on the information assembled and regularly updated by the [World Nuclear Association](#) and [World Nuclear News](#). Teams at their London-based headquarters have worked around the clock to stay abreast of developments and make objective information available to the public and the global nuclear industry. Additional information is, of course, available from the [IAEA](#).

The WiN Communications Committee is working with WNA to develop additional information and sources. Please communicate with both of us if you have ideas as to how WiN and WNA can better serve the goal of a well-informed public.

Regards,

John B Ritch  
Director General  
World Nuclear Association

Cheryl L Boggess  
President  
Women In Nuclear

Women in Nuclear Global, c/o World Nuclear Association  
Carlton House, 22a St. James's Square  
London, SW1Y 4JH, United Kingdom  
[www.win-global.org](http://www.win-global.org)