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NED Newsletter

Nuclear Engineering Division Newsletter
Joe Miller – Editor 703-356-4149

Special Interest Articles:

Highlights of NED:

Message from Incoming NED Chairman

Robert W. Tsai, PhD
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I hope the Newsletter finds you well and you all have time to enjoy the summer. On behalf of the ASME Nuclear Engineering Division (NED) Executive Committee, I would like to extend our greetings to you for another exiting nuclear year.

2007/2008 was a truly remarkable year for ASME/NED. Under the leadership of our past Chair, Professor Jay F. Kunze of the Idaho State University and the Technical Program Chair, Professor Igor Pioro of the University of Ontario Institute of Technology, we have organized one of the most successful ICONEs (International Conference on Nuclear Engineering). The ICONE-16 was held on May 11-15, 2008, at the Disney's Contemporary Resort in Orlando, Florida. Over 620 presentations were made and 733 worldwide nuclear professionals attended the Conference. You made this possible. Thank you very much.

Currently, the US and worldwide nuclear units are experiencing superior safe, reliable and economic performance. There are over 30 new nuclear plants being planned in the US; therefore the ***Nuclear Renaissance*** is indeed here and we are very pleased and excited to be part of this significant historical moment!

I would like to take this opportunity to reiterate our vision and mission:

> **"We will be the premiere technical society to provide the comprehensive forums for interactions between nuclear professionals. We will promote technology advances to support performance improvement of the of current plants as well as development for future generation reactors."**

We are driven to propel the Nuclear Renaissance and we actively promote the international collaboration of

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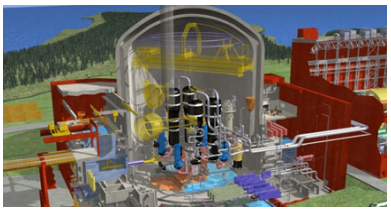
Editor's Message

The purpose of this newsletter is to keep the NED membership informed on new developments and important activities in the nuclear industry. This newsletter places an emphasis on the worldwide nuclear expansion. Table 1 shows the current list of reactor designs. By reviewing Table 2 on page 10, you can see that significant growth for nuclear power is planned throughout the world. As noted in Table 2, the number of operational reactors in the world is currently at 439 plants, but the signs of significant expansion are also noted. From Table 2, the number of reactors under construction is 36, the number of reactors planned is 93 and the number of reactors proposed is 218. This reminds me of the euphoric days of the 1970's with so many reactors being proposed. So let's not forget about our operating fleet. Any mishap will obviously impact the new revival.

Continued on Page 11

The 1,600 megawatt nuclear power plant is under construction at a place called Olkiluoto, Finland.



3D mock up of the EPR reactor building similar to Olkiluoto reactors

Inspecting Nuclear Fuel

World's most powerful nuclear power plant under construction at Olkiluoto

By Eljas Repo from Virtual Finland

The biggest nuclear reactor in the world is being built on a beautiful promontory jutting out into the sea in western Finland. The 1,600 megawatt nuclear power plant is under construction at a place called Olkiluoto in the municipality of Eurajoki.

Construction work commenced in 2005, but the project has not gone entirely to plan and work is expected to be delayed by two years at least. The client for the power plant is the Finnish power company TVO (Teollisuuden Voima Oy), and it is being built by a consortium consisting of the French company Areva and the German company Siemens. The project is generally known in Finland as Olkiluoto 3 but is referred to in the trade as OL3.

At the start of the new millennium, the Finnish government began promoting nuclear power. This was a bold move, since elsewhere in the western world nuclear power did not and does not enjoy political favour. The arguments used to persuade Finnish MPs

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Nuclear Power Today

Excerpts from http://www.world-nuclear.org/

Nuclear generation began 50 years ago and now generates as much global electricity as was produced then by all sources. Some two-thirds of world population lives in nations where nuclear power plants are an integral part of electricity production and industrial infrastructures. Half the world's people live in countries where new nuclear power reactors are in planning or under construction. Thus, a rapid expansion of global nuclear power would require no fundamental change - simply an acceleration of existing strategies. The New Reactor design in the US are shown in Table 1 on page 9. Uranium requirements and number of plants throughout the world are presented on Table 2 on page10.

Today nearly 440 nuclear reactors produce electricity around the world. More than 15 countries rely on nuclear power for 25% or more of their electricity. In Europe and Japan, the nuclear share of electricity is over 30%. In the U.S., nuclear power creates 20% of electricity.

Around the world, scientists in more than 50 countries use nearly 300 research reactors to investigate nuclear technologies and to produce radioisotopes for medical diagnosis and cancer therapy. Meanwhile, on the world's oceans, nuclear reactors have powered over 400 ships without harm to crews or the environment. In the Cold War's aftermath, a key activity is the removal of nuclear material from weapons and its conversion to fuel for civil nuclear power.

Many countries have a strong commitment to nuclear power. Among these are China, India, the United States, Russia and Japan, which together represent half of world population. Other nations - such as Argentina, Brazil, Canada, Finland, South Korea, South Africa, Ukraine and several other countries in Central and Eastern Europe - are acting to increase the role of nuclear power in their economies. Key developing nations without nuclear power - such as Indonesia, Egypt and Vietnam - are considering this option.

Nuclear power provides energy independence and security of supply. France, with 60 million people, obtains over 75% of its electricity from nuclear power and is the world's largest net exporter of electricity. Italy's 60 million people have no nuclear power and are the world's largest importers of electricity.

Russia Building First Floating Plant

by Marsha Freeman

This article appeared in the April 27, 2007 issue of ***Executive Intelligence Review.***

At a ceremony on April 15, attended by the head of Russia's Federal Atomic Energy Agency, First Deputy Prime Minister Sergei Ivanov, and the President of Kurchatov Institute, Yevgeny Velikhov, Russia inaugurated a program to construct the first series of floating nuclear power plants. Such stand-alone nuclear facilities, which can bring electric power and process heat to remote regions and underdeveloped nations, have been planned for decades. Now the world's first floating nuclear plant is finally under construction.

The first pair of ship-mounted 35-megawatt electric nuclear reactors, modeled on the units in operation for decades in Russia's submarines and nuclear-powered ice breakers, will be completed in 2010. They will supply power to the Sevmash shipyard, which builds nuclear-powered submarines, and where the ship for the floating plants is under construction. Some of the electricity from the nuclear plants will also be supplied to a nearby municipality.

As a commentator for *RIA Novosti* noted on April 14, floating nuclear power plants "are the dream of power-hungry regions and large industrial enterprises that require an uninterrupted power supply, when no centralized source is available." The first seven floating nuclear plant units are being designated for remote sites in Russia that are chronically short of power. These are scheduled to be on line by 2015. Reportedly, the natural gas giant Gazprom is considering units for its Arctic oil extraction operations.

But the real promise of this "new Russian technological wonder," is the introduction of nuclear power to developing nations. At the ceremony, where a commemorative plaque was dedicated, Russian nuclear officials reported that a dozen nations in Asia and Africa have expressed interest in obtaining floating nuclear power plants. In fact, Russia has offered to provide such technology to many countries, including Indonesia, China, Malaysia, Algeria, Argentina, and also Namibia, with which it is negotiating agreements to secure uranium for fuel.

The first ship-borne plants, named for Russian scientist Mikhail Lomonosov (1711-1765), are being built at the shipyard in Severodvinsk and will serve as a working model to be visited and examined by other nations, which are potential importers of the plants.

Nuclear Power for All

Responding to criticism about safety, nuclear agency head Sergei Kiriyenko stated that the safety guarantee "is the tremendous expertise built up by the Russian nuclear ice-breaking fleet, with its 7,000 reactor-years" of safe operations. The $200-300 million Lomonosov will drop anchor in the White Sea, with an expected service life of 38 years.

When operating in other countries, the reactor units would be returned to Russia for defueling and maintenance. Russia will own and be responsible for the facilities, selling the plant's output to the customer. The plant is capable of supplying the power needs for a city of 200,000, and when used for desalination, can produce 240,000 cubic meters of fresh water daily.

When the ship arrives at its destination, towed by a tug boat, a minimum of infrastructure is needed beforehand. Transformer units for the power, pumps, and other auxiliary equipment will all be on the barge. It is estimated that one floating nuclear power plant will replace up to 200,000 tons of coal, or 100,000 tons of petroleum, per year.

The concept of placing nuclear reactors on barges, that can be situated in the ocean, on shore, and in estuaries, is not a new one. In 1972, Public Service Electric and Gas Company of New Jersey, signed a contract with Offshore Power Systems, owned by Westinghouse, to purchase two floating nuclear plants. A few months later, the utility exercised an option to buy two additional units. Two years after that, an application was submitted to the regulatory agency to build the Atlantic Generating Station, 2.8 miles off the New Jersey coast, about 11 miles northeast of Atlantic City. The first plant was to come on line in mid-1988.

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Final Numbers on ICONE16

In total: 733 participants (USA – 43%; Japan 19%; EU – 18% (Germany – 4%; France - ~4%; Sweden – 2%; and other EU countries – 8%); China – 7%; Canada – 6%; and other countries – 7%); 620 presentations (479 technical papers; 87 oral technical presentations; and 54 panel presentations).

In addition – 64 participants in Early Career Seminar; 35 – in CFD Seminar; 14 – in Engineering Reliability and Life Cycle Management Seminar; and 14 – in CD-Adapco CFD Seminar.

ASME News

This month's issue of ASME News Online is now available for you to read, exclusively at http://www.asmenews.org. The issue includes news stories on such topics as:

Engineering Headlines
July 20, 2008 - Sunday

1. Hydrogen Vehicles Making Impressive Progress Toward Commercialization
   Mechanical Engineering Jul 18, 10:24 AM EST
2. Gore Calls for Move to Carbon-Free Power in the Next 10 Years
   Virginian - Pilot Jul 18, 07:11 AM EST
3. RoboCup: Humanoid Soccer Robots Could Challenge for World Cup by 2050
   The Roanoke Times Jul 18, 10:21 AM EST
4. Obama Shifts Environmental Stance
   USA TODAY Jul 18, 05:00 AM EST
5. British Students Win U.S.-UK Rocket Contest at Farnborough
   U.S. Newswire Jul 18, 12:51 PM EST
6. 'Nanosculpture' Could Enable New Types Of Heat Pumps And Energy Converters
   Mechanical Engineering Jul 18, 10:25 AM EST
7. Missouri Hydrogen Car Team Members Hope to Retool
   Columbia Daily Tribune Jul 17, 04:13 PM EST

ASME PeerLink: Your Virtual Collaboration Tool

ASME's PeerLink is an online interaction tool designed with engineers' needs in mind with links to helpful resources, solutions and ideas from peers. It's much more than discussion boards, because there are many tools integrated into this site to help ASME PeerLink members connect with each other.

Access to the ASME PeerLink site is open to both members and non-members of ASME. To access ASME PeerLink, go to http://peerlink.asme.org. The comprehensive user guide is available at http://peerlink.asme.org/COP/Shared/Home/UsersGuide.pdf. For more information you can contact Mel Torre, Director of Communications at torrem@asme.org.

Important Links

For information on ICONE17 go to http://www.asmeconferences.org/icone17/
Go to NED Web Site - http://www.divisions.asme.org/ned/
To pick up the latest ASME News - http://www.asmenews.org/latebrk/latebrk.html
New Nuclear Plants - http://www.nrc.gov/reactors/new-reactor-licensing.html
Other Important Links at http://divisions.asme.org/ned/links/index.html

Nuclear Power and the Hydrogen Economy

Taken from http://www.usnews.com/usnews/tech/nextnews/archive/next041209.htm

The hydrogen economy may be on its way, but where are we going to get the hydrogen from? Since hydrogen gas is not found in great quantities on Earth, it must be separated from other substances such as water or fossil fuels. To do this requires energy from some source. So, in effect, hydrogen serves as a storehouse or carrier of energy.

Environmentalists are big fans of hydrogen, since the only byproduct created by burning it is water. Ideally, greens would favor producing the hydrogen via solar power, which is clear, renewable and does not produce carbon dioxide. Unfortunately, solar is an immature technology. Nuclear energy—a technology already in use, of course—doesn't produce CO2 either, but it does produce radioactive waste. Thus, most environmentalists in America are down on nuclear. But more and more, it looks like nuclear may play a big role in the hydrogen economy. Indeed, researchers at the Department of Energy's Idaho National Engineering and Environmental Laboratory recently showed that it's possible to more efficiently separate hydrogen from water using an advanced nuclear reactor system.

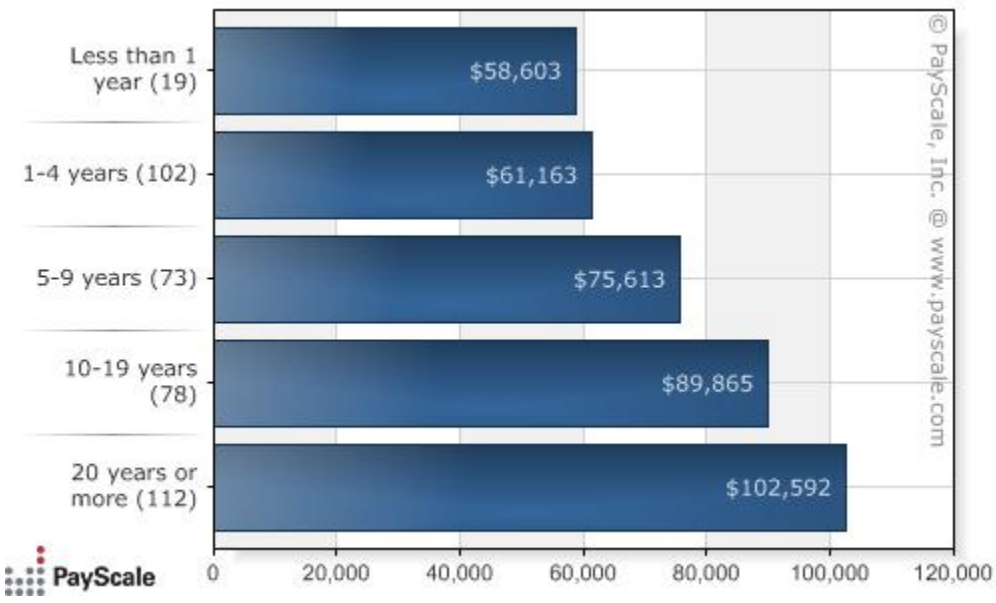
As this press release states:

"Such a high-temperature system has the potential to achieve overall conversion efficiencies in the 45 percent to 50 percent range, compared to approximately 30 percent for conventional electrolysis. Added benefits include the avoidance of both greenhouse gas emissions and fossil fuel consumption."

This research seems to make the nuclear option more compelling—as well as creating a more vexing choice for antinuclear environmentalists concerned about climate change.

Nuclear Engineering Salary Survey

Median Salary by Years Experience - Job: Nuclear Engineer (United States)
Source: Updated 7/15/2008
http://www.payscale.com/research/US/Job=Nuclear_Engineer/Salary



International Conference on Nuclear Engineering ICONE 17

The **International Conference on Nuclear Engineering (ICONE)** is the premier global conference for addressing the needs of the nuclear industry. The conference will take place July 12-16, 2008 and will be held at the Sheraton Brussels Hotel. Go to http://www.asmeconferences.org/ICONE17/ for more information.

We invite you to join us at ICONE17. Topics will include:

- Plant Operations, Maintenance, Installations And Life Cycle
- Component Reliability And Materials Issues
- Structural Integrity
- Next Generation Systems
- Safety And Security
- Codes, Standards, Licensing And Regulatory Issues
- Instrumentation & Controls (I&C)
- Advanced Applications Of Nuclear Technology
- Fuel Cycle And High Level Waste Management
- Low Level Waste Management And Decommissioning
- Thermal Hydraulics
- Computational Fluid Dynamics (CFD), Neutronics Methods And Coupled Codes
- Near Term Deployment - Plant Designs, Construction, Workforce And Public Acceptance

Links to ASME Codes and Standards

Links for Students

- An Introduction to Codes & Standards for Students
  http://files.asme.org/ASMEORG/Codes/About/Links/1028.pdf
- ASME C&S - Examples of Use for Mechanical Engineering Students
  http://files.asme.org/ASMEORG/Codes/About/Links/3116.pdf

ANSI Links

- ANSI Standards Action
  http://www.ansi.org/news_publications/periodicals/standards_action/standards_action.aspx?menuid=7
- The National Standard Systems Network (NSSN) http://www.nssn.org/

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Message from Incoming NED Chairman (cont.)

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of technology as Dr. Dale Klein, the NRC Chairman, often stated, “an accident anywhere is an accident everywhere”.

As many of you know, ICONE-17 will be held on July 12-16, 2009, in Brussels, Belgium (www.asmeconferences.org/icone17). The Steering Committee, Organizing Committee, and the ASME staff are already hard at work in planning the conference. Your input and participation have been and will be the key for our success. I am looking forward to hearing from you.

Robert W. Tsai, Chairman, ASME/NED
Exelon Generation Company

World’s most powerful nuclear power plant under construction at Olkiluoto (cont.)

Continued from Page 2

were that nuclear power would increase independence from imported Russian energy, be environmentally cleaner than other options and an economical energy source. On the basis of these arguments, the Finnish Parliament approved the nuclear power decision by a vote of 107 to 92, although it is doubtful whether a majority of Finns would have approved the project.

Public opinion has now become more favourable towards nuclear power, and the next power plant projects are likely to have an easier ride. There are several such projects in the pipeline.

There are only four countries in Europe where nuclear reactors are currently being built. Besides Finland and France, there are projects under way in Romania and Slovakia, but the reactors in those two countries are considerably smaller.

According to the World Nuclear Association, the greatest number of nuclear reactors under construction can be found in Russia (7), followed by India (6) and China (4). All of these reactors are smaller than the one at Finland's Olkiluoto plant.

EU Energy Commissioner Andris Piebalgs visited Finland in the summer to take a look at the construction work in Olkiluoto. He chose to praise OL3 to the Finnish News Agency (STT)saying: *"The reactor under construction at Olkiluoto is the world's first third-generation nuclear power plant. Olkiluoto is also a pioneer insofar as the world's first facility for final disposal of high-level nuclear waste is being built there."*

The Government and Parliament are expected to deal with the new nuclear power plant project during the present Government's term of office, i.e. before the new Olkiluoto plant receives start-up clearance. The energy companies intend to bring Finland's sixth and possibly seventh nuclear power plants on stream around 2016-2018.

Finland's nuclear power plants:

Plant	Building permit	Operating licence
Loviisa 1	30 June 1971	18 November 1976
Loviisa 2	27 September 1972	15 May 1980
Olkiluoto 1	31 January 1974	06 July 1978
Olkiluoto 2	04 August 1975	01 September 1979
Olkiluoto 3	17 February 2005	(Under construction)

Comments from Past Chair – Jay Kunze Postscript on the Successful ICONE 16 Meeting - from the Past Chairman of NED

It was a pleasure to meet so many of our colleagues from throughout the world at the recent ICONE 16 meeting at Disney World in Orlando, Florida. This had the largest attendance of any of the ICONE meetings. (See statistics elsewhere in this newsletter). We set the goal of having high quality of the papers presented at the meeting, and published in the Proceedings on CD available to all registrants. With each paper receiving at least two reviews, the reviewer's goals were to help the authors improve their papers, not only in the technical content but also in the readability. The purpose of the review was primarily to make the paper more useful and understandable to colleagues. This policy will continue for ICONE 17.

A successful future of nuclear power for the world is the goal of ICONE meetings, focusing more on applications and industry experience than on research. However, the future of nuclear power depends on a well educated and dedicated new generation of nuclear engineers. ICONE 16 sponsored 50 students from all over the world, providing their registration, housing and most meals at the conference, plus a modern power plant tour especially for the students. Travel costs to the meeting for these students were generally covered by their nation's ICONE organization, the ASME-NED for the US students. The student activities are so important that the NED will continue this support, perhaps even expanding the amount of financial commitment for the student programs in the future.

Finally, we were delighted with the many exhibitors and the great displays. These provided a wonderful opportunity for attendees and exhibitors to become acquainted with each other, so that the attendees would have a better understanding of the great depth and breadth of the nuclear industry. We thank all of the exhibitors, and hope that each felt they benefitted from ICONE 16.

Jay F. Kunze (kunzejay@isu.edu),
Past chair of the Nuclear Engineering Division.

Upcoming ASME Conferences

2008 Symposium on Mechanics of Slender Structures
Jul 23 2008 - Jul 25 2008

2008 Pressure Vessels and Piping Conference (PVP)
Jul 27 2008 - Jul 31 2008

International Design Engineering Technical Conference and Computers and Information in Engineering Conference (IDETC/CIE)
Aug 03 2008 - Aug 06 2008

2008 ASME Heat Transfer /Fluids /Solar /Nano Conferences (HTFESN2008)
Aug 10 2008 - Aug 14 2008, Jacksonville, Florida, United States

ASME Energy Sustainability 2008 (ES2008)
Aug 10 2008 - Aug 14 2008

Heat Transfer
Aug 10 2008 - Aug 14 2008

International Conference on Automation and Logistics (ICAL)
Sep 01 2008 - Sep 03 2008

2008 International Hydrogen Conference
Sep 07 2008 - Sep 10 2008

Russia Building First Floating Plant (cont.)

Continued from Page 3

Between 1972 and 1978, Offshore Power Systems spent $100 million for dredging, construction, and materials purchases at the Blount Island factory, near Jacksonville, Florida, to prepare for the manufacture of the world's first floating nuclear power plants. The concept was to place a conventional plant on top of a barge and float it to the desired location. Other electric utilities, on the East and West coasts, expressed interest.

These plants were never built. Even before the accident in 1979 at Three Mile Island, political sabotage by the well-funded neo-Malthusian anti-nuclear movement had led to the demise of nuclear power. Floating nuclear plants eventually went the way of the more than 100 cancelled conventional reactors, and the never-built next-generation breeder reactors and high-temperature gas-cooled nuclear power plants.

Since 1998, Russia has been trying to rebuild, modernize, and reorganize its nuclear power industry. But this effort could not begin in earnest, until President Putin more recently reasserted Russia's national sovereignty, wresting control of strategic enterprises from privatizing oligarchs. While Russia is building new conventional nuclear power plants in Iran, China, and India, it is also making the most modern nuclear technology available for export.

Table 1 New Reactor Designs

Reactor Design	Vendor	Approximate Capacity (MWe)	Reactor Type	Certification Status	Target Certification in USA
AP600	Westinghouse	650	PWR	Certified	Certified
AP1000*	Westinghouse	1117	PWR	Certified	Certified
ABWR*	GE et al	1371	BWR	Certified	Certified
System 80+	Westinghouse	1300	PWR	Certified	Certified
ESBWR*	GE	1550	BWR	Undergoing certification	2007
EPR*	AREVA NP	1600	PWR	Pre-certification	2009
PBMR	Westinghouse, Eskom	180	HTGR	Pre-certification	Not Available
IRIS	Westinghouse et al	360	PWR	Pre-certification	2010
US APWR	Mitsubishi	1600	PWR	Undergoing certification	2011
ACR Series	AECL	700-1200	Modified PHWR	Pre-certification	Not Available
GT-MHR	General Atomics	325	HTGR	Research prototype planned	Not Available
4S*	Toshiba	10-50	Sodium-cooled	Potential construction	Not Available

Note: Data are approximate targets which may change. Reactor types are defined below. Designs marked with an asterisk (*) are also supported by electricity generating firms or organizations publicly investigating possible construction in the U.S. AECL is Atomic Energy of Canada Limited. Taken from http://www.eia.doe.gov/.

Table 2 World Nuclear Power Reactors 2007-08 and Uranium Requirements

9 June 2008

	NUCLEAR ELECTRICITY GENERATION 2007		REACTORS OPERABLE May 2008		REACTORS UNDER CONSTRUCTION May 2008		REACTORS PLANNED May 2008		REACTORS PROPOSED May 2008		URANIUM REQUIRED 2008
	billion kWh	% e	No.	MWe	No.	MWe	No.	MWe	No.	MWe	tonnes U
Argentina	6.7	6.2	2	935	1	692	1	740	1	740	123
Armenia	2.35	43.5	1	376	0	0	0	0	1	1000	51
Bangladesh	0	0	0	0	0	0	0	0	2	2000	0
Belarus	0	0	0	0	0	0	2	2000	0	0	0
Belgium	46	54	7	5728	0	0	0	0	0	0	1011
Brazil	11.7	2.8	2	1901	0	0	1	1245	4	4000	303
Bulgaria	13.7	32	2	1906	0	0	2	1900	0	0	261
Canada*	88.2	14.7	18	12652	2	1500	3	3300	4	4400	1665
China	59.3	1.9	11	8587	7	6700	24	26320	76	62600	1396
Czech Republic	24.6	30.3	6	3472	0	0	0	0	2	1900	619
Egypt	0	0	0	0	0	0	0	0	1	1000	0
Finland	22.5	29	4	2696	1	1600	0	0	1	1000	1051
France	420.1	77	59	63473	1	1630	0	0	1	1600	10527
Germany	133.2	26	17	20339	0	0	0	0	0	0	3332
Hungary	13.9	37	4	1826	0	0	0	0	2	2000	271
India	15.8	2.5	17	3779	6	2976	10	8560	9	4800	978
Indonesia	0	0	0	0	0	0	2	2000	2	2000	0
Iran	0	0	0	0	1	915	2	1900	1	300	143
Israel	0	0	0	0	0	0	0	0	1	1200	0
Japan	267	27.5	55	47577	2	2285	11	14945	1	1100	7569
Kazakhstan	0	0	0	0	0	0	0	0	1	300	0
Korea DPR (North)	0	0	0	0	0	0	1	950	0	0	0
Korea RO (South)	136.6	35.3	20	17533	3	3000	5	6600	0	0	3109
Lithuania	9.1	64.4	1	1185	0	0	0	0	2	3200	225
Mexico	9.95	4.6	2	1310	0	0	0	0	2	2000	246
Netherlands	4.0	4.1	1	485	0	0	0	0	0	0	98
Pakistan	2.3	2.34	2	400	1	300	2	600	2	2000	65
Romania	7.1	13	2	1310	0	0	2	1310	1	655	174
Russia	148	16	31	21743	7	4920	10	11960	25	22280	3365
Slovakia	14.2	54	5	2064	2	840	0	0	0	0	313
Slovenia	5.4	42	1	696	0	0	0	0	1	1000	141
South Africa	12.6	5.5	2	1842	0	0	1	165	24	4000	303

	NUCLEAR ELECTRICITY GENERATION 2007		REACTORS OPERABLE May 2008		REACTORS UNDER CONSTRUCTION May 2008		REACTORS PLANNED May 2008		REACTORS PROPOSED May 2008		URANIUM REQUIRED 2008
	billion kWh	% e	No.	MWe	No.	MWe	No.	MWe	No.	MWe	tonnes U
Spain	52.7	17.4	8	7442	0	0	0	0	0	0	1398
Sweden	64.3	46	10	9016	0	0	0	0	0	0	1418
Switzerland	26.5	43	5	3220	0	0	0	0	3	4000	537
Thailand	0	0	0	0	0	0	0	0	4	4000	0
Turkey	0	0	0	0	0	0	0	0	3	4500	0
Ukraine	87.2	48	15	13168	0	0	2	1900	20	27000	1974
United Kingdom	57.5	15	19	11035	0	0	0	0	0	0	2199
USA	806.6	19.4	104	99049	0	0	12	15000	20	26000	18918
Vietnam	0	0	0	0	0	0	0	0	2	2000	0
WORLD**	**2608**	**16**	**439**	**371,989**	**36**	**29,958**	**93**	**101,395**	**218**	**192,975**	**64,615**
	billion kWh	**% e**	**No.**	**MWe**	**No.**	**MWe**	**No.**	**MWe**	**No.**	**MWe**	**tonnes U**
	NUCLEAR ELECTRICITY GENERATION 2007		REACTORS OPERATING		REACTORS BUILDING		ON ORDER or PLANNED		PROPOSED		URANIUM REQUIRED

Sources:
Reactor data: WNA to 30/05/08.
IAEA- for nuclear electricity production & percentage of electricity (% e) 5/08.
WNA: Global Nuclear Fuel Market (reference scenario) - for U.

Editor's Message (cont.)

Continued from Page 1

That is why it is important to stay abreast of current world wide nuclear activities and attend the largest and most revered nuclear conference in the world, which is ICONE (International Conference on Nuclear Energy). ICONE17 is being held in Brussels in 2009 to accentuate the world wide growth of nuclear power. So put July 12-16 on your calendar and join us in Brussels, Belgium for four days of papers, panels and networking. Go to http://www.asmeconferences.org/ICONE17/ for more information on ICONE17. If you have any questions or comments, email me at jsmeda@cox.net. Joe Miller

Nuclear Related Conference

ICEM

ICEM Announces that its next International Conference on …

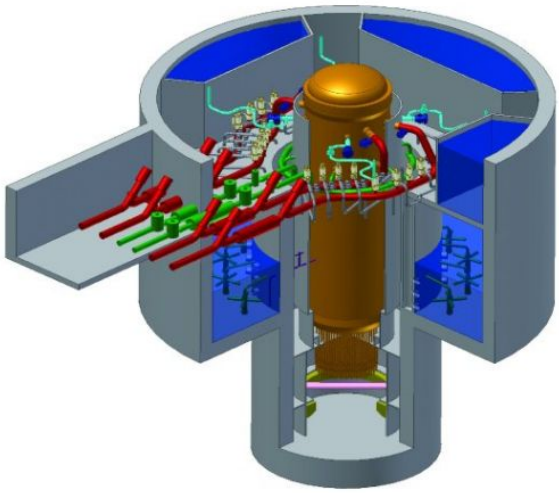
Environmental Remediation and Radioactive Waste Management

held on…

October 11-15, 2009 at the…

Liverpool Arena and Convention Centre (ACC), UK

http://www.icemconf.com/



3D Cut away of ESBWR (General Electric)

Synonyms: Sometimes called Economic Simplified Boiling Water Reactor or European Simplified Boiling Water Reactor though General Electric does not frequently use the name.

Reactor Type: Boiling Water Reactor

Approximate Capacity (electric): 1550 MWe plus
NRC Design Certification Status: Undergoing certification in USA

Supporting Generating Companies (potential site): Entergy (Grand Gulf, River Bend), Dominion Energy (North Anna)

The ESBWR is a new simplified BWR design promoted by General Electric and some allied firms. The ESBWR constitutes an evolution and merging of several earlier designs including the ABWR. The ESBWR, which includes new passive safety features, is intended to cut construction and operating costs significantly from earlier ABWR designs. GE and others have invested heavily in the ESBWR though the design and two US utilities, Dominion and Entergy have expressed an interest in possibly building the design at three sites. These utilities have stated that they might apply for a combined license (COL) to build and operate new ESBWR reactors during 2007 or 2008. The two utilities have also applied for Early Site Permits (ESPs) for the designs which the anticipate receiving during 2007. The ESBWR is presently undergoing design certification with the NRC.

About Our Organization…

The ASME Nuclear Engineering Division focuses on the design, analysis, development, testing, operation and maintenance of reactor systems and components, nuclear fusion, heat transport, nuclear fuels technology and radioactive waste.