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WANO BGM

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Recipients of the first WANO Nuclear Excellence Awards presented at the 2003 WANO BGM

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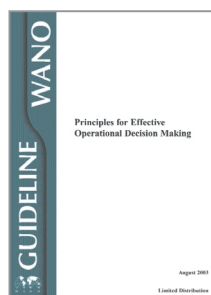
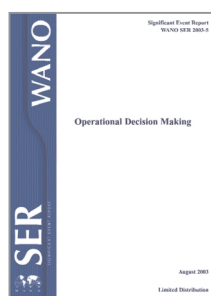
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Mike Harrison
 Technical and Safety Support Manager
 – Sizewell B

Lessons learned from recent events

Can good performance hurt?



Have you noticed that the more significant events that have occurred in the past several years generally occurred at plants that had good performance over a long period of time? If you have 10 or more years of good performance, chances are you are now at risk.

Is it just bad luck that these events occurred, or could it be that the management teams started to believe in their own success so much that they lost concentration or started to take success for granted? Analysis of recent events shows that good past performance often leads to overconfidence in one's own technical ability. This overconfidence can lead to trouble. WANO SOER 2003-2, SER 2003-5, and SER 2003-6, clearly show that a combination of past success coupled with other factors such as production pressures can create an environment that leads to flawed operational decisions. Several of the events discussed in these documents resulted in good performing plants being shut down for a year or longer with significant recovery costs along with a loss of regulator and public confidence. In the follow up investigations it is usually found that indicators were available, but missed or overlooked by the senior level managers at the plant.

Since these events are severely impacting performance, as well as the public and regulatory confidence of our industry, the WANO governing board has established a major initiative for 2003 and 2004 to help improve the operational decision making process within our industry. This initiative will include tools such as guidance documents that offer techniques to improve the decision making process and training materials for use at industry

workshops or on-site. It will also include peer review teams looking more closely for indications of over-confidence during their visits.

But the tools will not by themselves make any improvements if the management team at the plant does not believe that a risk exists. The most important element before improvement can start is to recognise complacency when it exists. For this reason, the ability to critically assess one's own processes is crucial. Years of good performance can lead to superficial self-assessments and creates a strong probability that event precursors will remain uncorrected until a significant event occurs. The WANO regional centres are available through Technical Support Missions to help stations organise or conduct self-assessments. It is far better to let a technical support mission identify weaknesses rather than have event investigations done after the fact.

References:

- WANO SOER 2003-2, "Reactor Pressure Vessel Head Degradation at Davis-Besse Nuclear Power Station"
- WANO SER 2003-5, "Operational Decision Making"
- WANO SER 2003-6, "Severe Damage to Fuel External to the Reactor Due to a Loss of Decay-Heat Removal"
- WANO Guideline 2002-01, "Principles for Effective Operational Decision Making"
- WANO Guideline 2001-07, "Principles for Effective Self-Assessment and Corrective Action Programmes"

If you don't think you can learn from these lessons, then you may be the next event...

Mike Harrison
 Technical and Safety Support
 Manager – Sizewell B



*Boris Bilik,
Director General of
South Ukraine NPP*

200th WANO

Peer Review

Milestone at South Ukraine NPP



“The framework of WANO has a beneficial effect on all our plant specialists and carries out the important mission to disseminate operating experience and arm all nuclear power plants worldwide with best industry practices.”

*Boris Bilik,
Director General of
South Ukraine NPP*

Following its first WANO peer review in 1995, South Ukraine NPP made considerable improvements to industrial safety, maintenance work practice, plant material conditions and documentation before hosting the 200th WANO peer review in June - July 2003.

Before the latest peer review, Alexander Brovko, Deputy Chief Engineer at Unit 3, took part in the Balakovo peer review in May. He says, “I explained to my colleagues what would be expected by the peer review team, so the staff worked hard to prepare for the visit.”

The international team of experts that comprised the peer review were from Russia, Ukraine, Bulgaria, France, Pakistan, Finland and the United States. During the peer review, open, professional relations were established between the team and the plant, showing where there is room for further improvement and refocused efforts. Boris Bilik, director general of South Ukraine NPP says, “The long-standing collaboration of South Ukraine within the framework of WANO has a beneficial effect on all our plant specialists and carries out the important mission to disseminate operating experience and arm all nuclear power plants worldwide with best industry practices.”

Valeri Grishin, Outage Planning Manager says, “The peer review highlighted several important issues that had been considered as being well under control, such as foreign material exclusion and industrial safety. It also noted good practices in mechanical and electrical workshops. We had the opportunity to discuss our newly started condition-based maintenance programme.”

In turn, Viacheslav Kuznetsov, deputy of director general said, “Before the peer review, we were quite sure of the

The WANO peer review programme started in 1992. It has grown to become one of WANO’s most valuable activities, demonstrating strong commitment from WANO members to compare their performance against best industry standards. WANO is moving towards completing peer reviews at every nuclear power plant worldwide by 2005, then at every plant at least every six years. More than twenty plants internationally have already hosted two or more peer reviews.

robustness of our fire protection, but WANO experts discovered significant room for further improvement that is extremely helpful for us.”

Dmitri Sokolov, Deputy Chief Engineer on Safety appreciated the opportunity to compare international standards in radiological protection. “We will revisit current radiological work practices when dealing with low level waste,” he says. “We have been convinced by our colleagues from WANO that much can be done to minimise individual and collective dose rates at our plant.”

South Ukraine NPP has a solid basis for training with two full-scope simulators and two functional computer-based facilities. “We are looking forward to improving our capabilities as the peer review will enhance management involvement and commitment to training activities,” says Marat Kabdulov, Deputy Head of Training Department.

Summarising the main results of the two-week review, Jussi Helske, WANO Exit Representative, says: “Operating alone, we become blind to our weaknesses. To prevent this, every nuclear power plant must invite independent expertise time and again.”

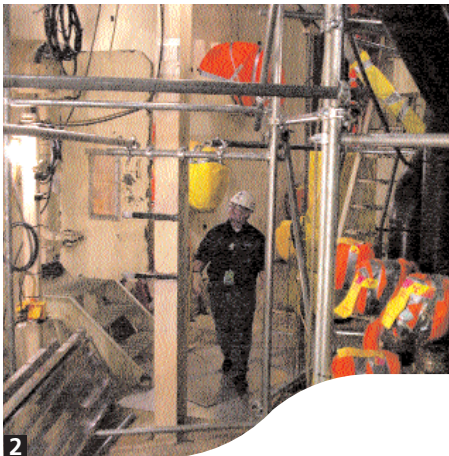
Browns Ferry

Nuclear power plant

New lease of life for Unit 1



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2

1. Browns Ferry NPP is on schedule to return to three unit operations in 2007
2. Jerry Schlessel inspects scaffolding in the Browns Ferry Unit 1 drywell

Since 1985, Browns Ferry Nuclear Plant Unit 1 has been idle, preserved for the day it might again produce electricity. Now it is being refurbished and rejuvenated to go back into service by 2007.

Browns Ferry is a three-unit nuclear station operated by the Tennessee Valley Authority (TVA) and located in the southeastern United States. Unit 1, which began operation in 1973, was one of five TVA nuclear units shut down in 1985 because of management and operations concerns. TVA has since restarted the other units, including Browns Ferry Unit 2 in 1991 and Unit 3 in 1995.

Says John Scalice, TVA chief nuclear officer, "We looked at the projected power needs and at alternatives for supplying those needs, which include purchasing power; finishing or restarting one of our nuclear units; or looking at other forms of generation."

Projections are that TVA's customers will need an additional 1,750 to 2,250 megawatts by 2010. Scalice says that with the infrastructure already in place, restarting Unit 1 is very competitive economically. "With licence renewal and extended power uprate, recovering this asset is a good business decision for TVA to provide low-cost, reliable power."

TVA plans to apply to the U.S. Nuclear Regulatory Commission for a 20-year extension of the operating licences for all three Browns Ferry units, which expire between 2013 and 2016. TVA plans to extend power uprates to 1,280 megawatts – a 20 percent total increase – for all three units. Units 2 and 3 have already had 5 percent uprates.

Three units, one design

One goal for Browns Ferry is 'unit fidelity' – ensuring that all three units are

technically and operationally alike. All the modifications made during the restarts of units 2 and 3 will be made on Unit 1, using the same processes, procedures and design criteria. Also included are modifications made since restart and ones planned through 2005. "When Unit 1 comes on line in 2007, it will be essentially the same as units 2 and 3," Unit 1 Restart Vice President Jon Rupert says.

Components replaced on the other units will be replaced on Unit 1. The remaining components, which have been maintained under a layup programme, will be refurbished or rebuilt. "If we find that something can't be rebuilt, we'll buy a new one," Rupert says. "If it's obsolete, we'll find an alternative. In that case, we'll be creating a potential difference between the units, so we'll make that change on units 2 and 3 in later outages."

R.G. Jones, Unit 1 restart plant manager, worked on the restart of the two other units and says the work on Unit 1 uses lessons learned from those restarts. "The first restart, Unit 2, was the toughest one," Jones says. "We took the lessons we learned and applied them to the Unit 3 restart, and it went a lot more smoothly. We're applying those lessons to Unit 1. For example, one thing we had to deal with was a cable separation issue. It took so much effort to trace all the cables and to move the ones that didn't meet the current standards for Unit 1, that we're going to pull brand-new cables from the control panels."

There have also been piping issues – flow-accelerated corrosion, for example – with the two operating plants, where piping has been replaced over time. TVA elected to replace that piping as part of the restart work, rather than risk having to replace it later.

Work began in the drywell in January



“With licence renewal and extended power uprate, recovering this asset is a good business decision for TVA to provide low-cost, reliable power”

*John Scalice,
TVA chief nuclear officer*

2003. Based on previous experience, the work started with a chemical decontamination of the systems and removal of thousands of feet of cable and conduit, reducing the radiation levels so that the workers no longer need protective clothing.

Ensuring quality

Extensive planning, contractor training and use of the plant’s existing corrective action programme are all part of ensuring the quality of Unit 1 construction. Scalice says that ensuring restart activities do not affect the two operating units was a major consideration in deciding how to do the work. “We have a separate organisation from the operating staff and are using contractors.

While it’s a separate organisation, overall control is with the site vice president and his operating staff.”

Companies involved in the work include Bechtel, Stone and Webster, NUMANCO, General Electric, and Sargent & Lundy. TVA managers with extensive experience with the startup of the other Browns Ferry units are overseeing the project.

At its peak, the job is projected to use up to 2,400 contract workers. One challenge is making sure that all of the outside workers adhere to TVA’s quality standards. TVA personnel have worked with the contracting companies to develop additional training in the Browns Ferry’s corrective action process and in human performance training, such as how to recognise error-likely situations.

“Since contractors are coming from many different locations, we’re working to create a very self-critical culture on this project,” Rupert says. “We openly encourage issues to be brought forth through our corrective action programme. We’re also scheduling self-assessments that will include peers from outside TVA.”

Construction vs. operation

A number of barriers are in place to ensure

that work on Unit 1 does not affect the safe operation of units 2 and 3. Units 1 and 2 at Browns Ferry have some common equipment, such as the raw service water system, fire protection, ventilation, diesel generators and emergency core cooling water. A loop of Unit 1’s residual heat removal system acts as a backup for Unit 2. These common systems were put back in service when Unit 2 was restarted.

“To make sure we don’t affect the running units, the Unit 1 work control system uses the same procedures as the running units do,” Jones says. Any work that could affect units 2 or 3 becomes part of the affected unit’s work order process.”

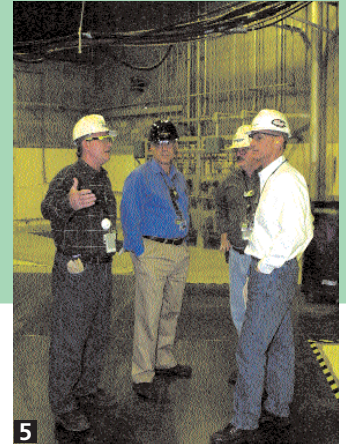
Workers in the operating units wear white-and-black hard hats, while the Unit 1 workers have bright-green ones. Says Rupert, “The hard hats are distinctive and can be seen easily.” There are barriers and monitored entrances between the units, and each Unit 1 worker wears a lanyard using the same technology as retail store tags that sound a warning if someone tries to leave before the tag has been removed. When Unit 1 workers walk up to a Unit 2 entrance, a light flashes and an electronic voice tells them they’re entering Unit 2 space. Additional controls include routing workers through a separate entrance to the reactor building in a new modular building.

Solving problems

Some solutions developed for the Unit 1 restart will also help in future outages. “The recirculation pump motors have to be inspected and rewound periodically, and there’s not a lot of room to move heavy equipment into and out of the drywell,” Unit 1 Maintenance and Modifications Manager Rick Drake says. “They were originally moved with a cart arrangement, but some of the ancillary equipment has been modified, so we don’t have the same access we had before.” TVA engineers worked with a contractor to design an electric cart that is guided by an operator using a cable remote control. It can be used on



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3. (From left) Rick Drake points out work in the Unit 1 drywell to Bill Baxter while John Scalice and Jon Rupert look on
4. Jerry Schlessel walks past the equipment entrance to the Browns Ferry Unit 1 drywell
5. (From left) Rick Drake, John Scalice and Jon Rupert review the restart effort with Bill Baxter



4

any of the three units to remove and replace the 25,000-pound motors.

The refurbished Unit 1 recirculation pump motors will be placed in Unit 3 in its 2004 outage. The rewound Unit 3 motors go into Unit 2 in 2005, and the Unit 2 motors will be ready in time for Unit 1 restart. New permanent transformers fed from on-site power will be used for the restart work and later will eliminate the need for temporary power during outages.

Looking to 2007

Work is planned location by location, starting with the drywell. TVA has planned the recovery effort so that designs will be complete before the start of modifications. Initial engineering focused on design changes required in the drywell and a portion of the reactor building, and on regulatory programmes. The engineering and design work for the drywell has been completed and modifications have begun.

Engineering for design changes in the reactor building and the control building are

under way and should be complete in about a year. Engineering for design changes in the turbine building are expected to begin near the end of 2003 and be complete in spring 2004. TVA expects modifications to be complete in late 2006, ready for a projected startup date in May 2007.

Says Scalice, "We still have a lot of work to do. Once the work is complete, we'll have a very detailed startup programme to make sure everything is operating properly."

For R.G. Jones, the Unit 1 restart will be a personal milestone. Jones joined TVA in 1973 and plans to retire after the Unit 1 restart. "I was the shift manager when all three units were running," Jones says. "I want all three running when I leave."

For further information, contact: Craig Beasley, Telephone: +1 (256) 729-7698, e-mail: cwbeasley@tva.gov

Restarting Browns Ferry's Unit 1 is projected to take 4.5 million work hours of engineering and 11.8 million work hours to replace the following:

- 142 miles of electrical cable
- 16 miles of conduit
- 1.1 miles of cable trays
- 3 miles of small bore pipes
- 2.5 miles of tubing
- 2 miles of large bore pipes
- 13,650 supports for conduits
- 6,863 supports for pipes
- 71,432 electrical terminations
- 188.5 tons of structural steel

WANO's 8th BGM

Theme of openness and transparency

“In order for us to raise our level of achievement, it is absolutely necessary to maintain openness between WANO and the member utilities through the frequent and appropriate exchange of information”

*Hajimu Maeda,
WANO Chairman*

The World Association of Nuclear Operators' eighth Biennial General Meeting (BGM) was held in Berlin, Germany on 12-14 October 2003. The meeting was hosted by the German nuclear utilities companies and the WANO Paris Centre with the theme of 'openness and transparency'.

Three hundred and eighty chief executive officers and senior executives representing nuclear plant operators in thirty four countries around the world were joined by suppliers, public figures and representatives from the International Atomic Energy Agency and the World Nuclear Association.

In his address, the WANO Chairman Hajimu Maeda outlined the theme of the meeting as Nuclear Safety: Our Global Challenge. He said, "Above and before everything else, we must resolve issues concerning the promotion of nuclear safety, which is the essence of WANO's existence. In order to accomplish this, we must devise a framework for continually addressing safety-related issues." He said that the industry is at a turning point. Performance numbers remain impressive and opportunities still exist for operational improvement, greater openness and transparency, and efforts to avoid complacency.

When WANO began in 1989, the emphasis was on establishing programmes to improve safety and reliability. WANO is now developing its programmes to help members improve performance.

Maeda said, "In order for us to raise our level of achievement, it is absolutely necessary to maintain openness between WANO and the member utilities through the frequent and appropriate exchange of information." This is being demonstrated by the steady increase of event reporting.

The theme continued with nuclear executives explaining how events at their plants resulted in financial and political repercussions. Current issues facing the industry include the loss of motivation to learn from others, which could

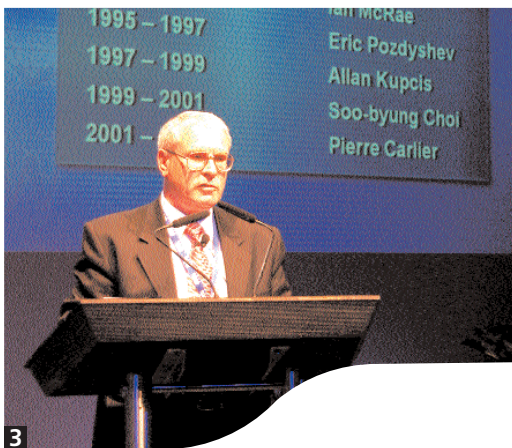
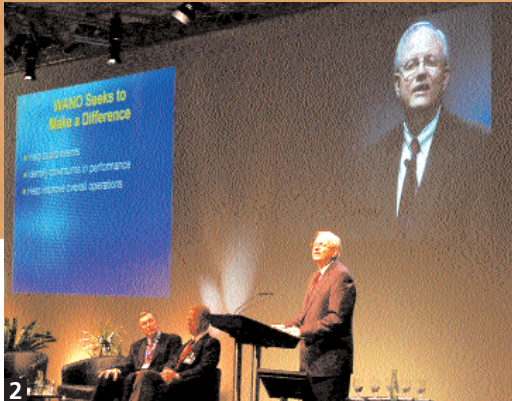


arise from over confidence, especially at those plants which have operated for a long time without significant problems. Another cause is negligence in cultivating a safety culture due to severe pressure to reduce costs following the deregulation of the power market.

For the first time at a BGM, a session addressed cooperation between nuclear suppliers and electric utilities with suppliers showing that by working with the operators, they too can help improve safety.

Sig Berg, WANO Managing Director said, "It should be clear that we are an inter-connected international community that depends on each other. We should be concerned if we are not actively learning from each other, or if a member is not participating in WANO or we see a downturn in a member's performance. WANO desires to make a difference at every nuclear site in the world. We seek to help you avoid significant events, and also identify downturns in performance, and help improve overall operations."

WANO's major programmes have matured and are being widely used as a resource by its members. The 200th Peer Review, representing a landmark in WANO's history, was conducted at South Ukraine nuclear power plant in July. The number of Peer Reviews is steadily increasing towards the challenge that was presented at the 1999 BGM in Victoria for



1. Hajimu Maeda, WANO Chairman
2. Sigval Berg, WANO Managing Director
3. Oleg Saraev, newly elected WANO President

every nuclear power plant in the world to host a Peer Review by 2005, then at least every six years. A number of nuclear power stations have already hosted their second peer review and some stations have had three peer reviews.

Maeda said, "It is essential to capitalise on the superiority of nuclear energy if we are to create a brighter future for mankind. In order to do so, we must sweep away any uneasiness about nuclear energy which is rooted deeply in the mind of the public. We must also ensure that nuclear energy is competitive so that it can survive in a deregulated electricity market. In this regard, nuclear energy has come to a crossroads which will determine our future. That is why I believe the present situation demands that WANO respond to these tremendous challenges."

At the meeting, Oleg Saraev, Director General of Concern "Rosenergoatom", Minatom of Russia, Moscow, was elected president of WANO. He will serve until the next WANO Biennial General Meeting in October 2005 and succeeds Mr Pierre Carlier, former executive vice president of industry, Electricité de France.

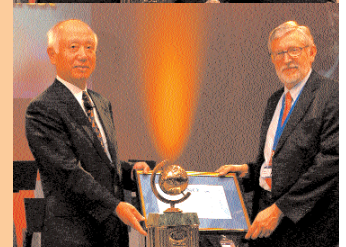
WANO Nuclear Excellence Award

During the meeting, WANO awarded its first set of Nuclear Excellence Awards.

The awards recognise individuals who have made extraordinary contributions to excellence in the operation of nuclear power plants, or the infrastructure that supports the nuclear power enterprise, or through WANO.

Six nuclear professionals who are widely recognised by their peers and colleagues for exceptional performance within the scope of their authority or position in their respective organisations received awards:

- Rebba Bhiksham of Nuclear Power Corporation of India Limited
- Won-yong Chung of Korea Hydro and Nuclear Power Company
- Pedro Jose Diniz de Figueiredo of Eletrobras Termonuclear S.A, - Eletronuclear, Brazil
- Bernard Fourest of Electricité de France
- Oliver D. Kingsley, Jr. of Exelon Corporation, U.S.
- Paul Spekkens of Ontario Power Generation, Canada.





Toshiyuki Furubayashi,
Director of Fugen NPS

Fugen's advanced thermal reactor

Plutonium utilisation at Fugen NPS

“Fugen was designed and constructed under the concept of utilising plutonium effectively as fuel, generated from used uranium, to make the best use of limited uranium resources in Japan. Moreover, demonstrating the plutonium recycle is another big achievement”

Toshiyuki Furubayashi,
Director of Fugen NPS

The advanced Thermal Reactor (ATR) at Fugen, Japan, is the only research reactor of this type in the world. For 25 years, Fugen operated as a research and development plant, attaining initial criticality in 1978 and full operation in 1979. With a gross electric output of 165MWe, Fugen was constructed as a Japanese government project to create reactors of domestic design.

Fugen is heavy water moderated and light water cooled. Though the core structure is different from other light water reactors, it is similar to boiling water reactors, generating electricity by driving the turbine with steam generated in the core.

With an average capacity factor of 62 percent, Fugen achieved notable records for a prototype reactor.

The Japanese government ceased development of the ATR project in September 2003. As a result Fugen terminated operation on 29 March this year.

Toshiyuki Furubayashi, director of Fugen NPS says, “The Fugen project started in the incunabula stage of Japan’s nuclear technology development. There was great significance for our country’s nuclear industry in completing the self-dependent development in this period, by designing, constructing and operating the new station by ourselves. Fugen was designed and constructed under the concept of utilising plutonium effectively as fuel, generated from used uranium, to make the best use of limited uranium resources in Japan. Moreover, demonstrating the plutonium recycle is another big achievement.”

Using plutonium fuel

Since attaining initial criticality with 22 MOX fuel assemblies, Fugen operated with UO₂ and MOX fuels. The plant used 772 MOX fuel assemblies during its lifetime -- equivalent to 1,850kg of plutonium. More than 3,000 plutonium fuel assemblies have been used in Europe, mainly in France and Germany. The



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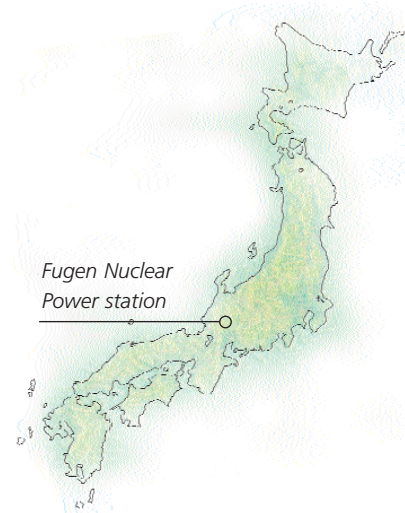
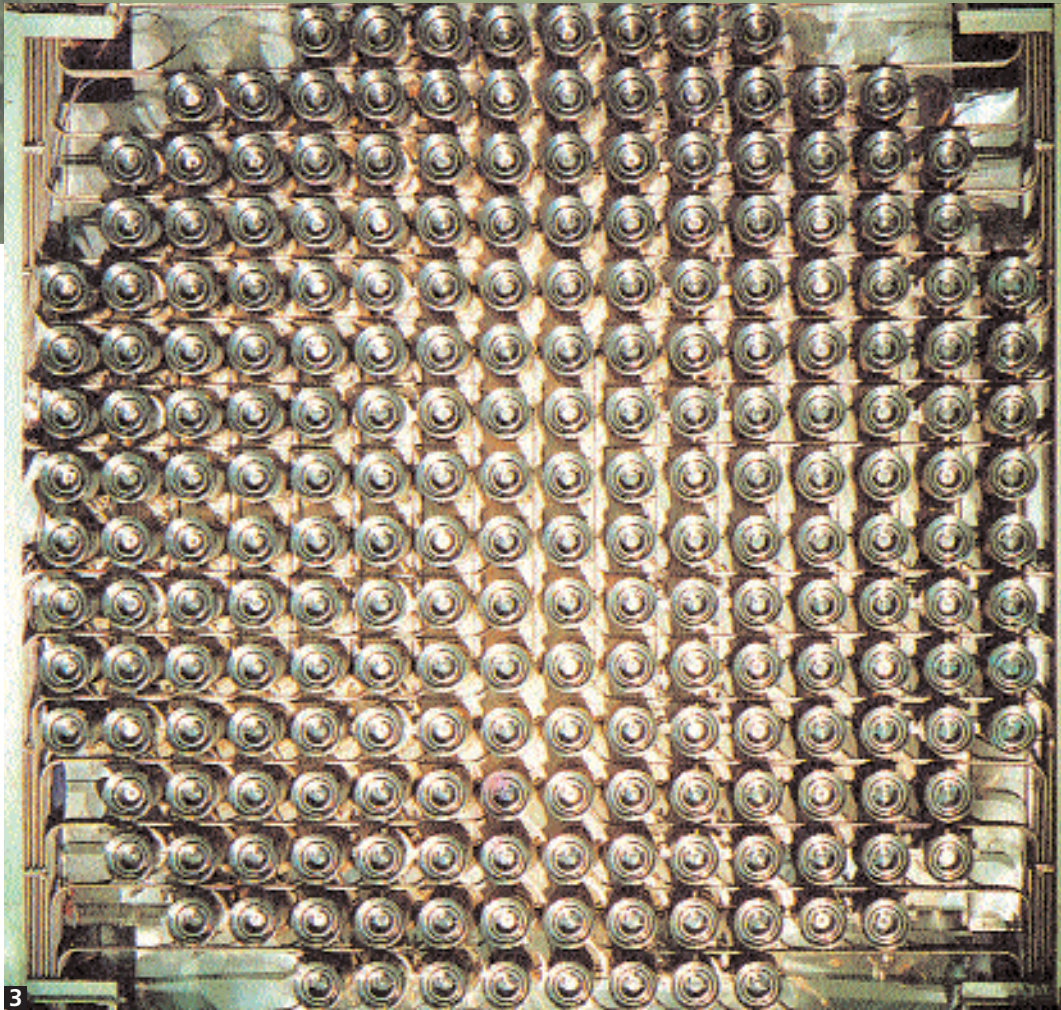


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1. Advanced Thermal Reactor, “Fugen”
2. Control room at the shutdown operation on 29 March 2003
3. Fugen’s reactor core (Pressure tube view from the reactor bottom)

number of loaded MOX fuel assemblies at Fugen is the largest at a single power station anywhere in the world.

“Fugen had been operating safely for 25 years as the first Japanese designed and made nuclear power station,” said Furubayashi. “At the same time, it played a leading role in the domestic nuclear industry, proving and demonstrating the use of plutonium as a fuel. After termination of its operation, Fugen will take on the decommissioning project as a new



mission to develop and demonstrate new technologies for the future.”

The nuclear fuel cycle

In the early stages of its operation, plutonium used for MOX fuel at Fugen was imported from overseas. Since 1981, Fugen has used plutonium from Japanese LWR spent fuel recovered and reprocessed at Japan Nuclear Cycle Development Institute’s Tokai reprocessing plant. In June 1988, Fugen completed the nuclear fuel cycle by loading four MOX fuel assemblies with re-fabricated plutonium recovered from the spent MOX fuel of Fugen itself.

Fugen’s achievements in plutonium use, based on the notable operational performance, have played a pioneering role in establishing the basic national policy for the nuclear fuel cycle. At the same time, it has greatly contributed to the understanding of Japan’s plutonium use, both nationally and internationally.

Decommissioning project

Although Fugen has terminated its operation, Furubayashi says that does not

mean that the plant’s role in technological development is complete. “We still have a long way to go to decommission the station,” Furubayashi says. “Technologies and experiences acquired from the decommissioning project will be valuable for subsequent LWRs. We would like to make the best use of Fugen as a place to develop and demonstrate decommissioning technologies.”

Historical Facts. Did you know?

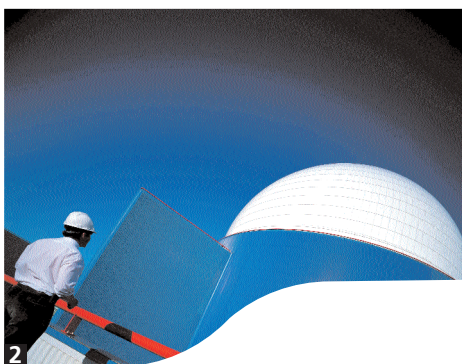
According to ancient Buddhist philosophy, Fugen Bosatsu is one of the highest ranking Buddhas after ‘Buddha’. The philosophy teaches that sympathy and compassion are important qualities in attaining wisdom, power and strength. The great Buddhist is often depicted on a white elephant with six tusks showing power and vigour. Similarly, nuclear power has connotations of energy and power which uses the latest cutting edge technology. Hence the ATR prototype was named Fugen. Fugen was developed by Japan Nuclear Cycle Development Institute, which also developed Monju, the Japanese prototype fast breeder reactor. Based on a similar idea, the name Monju Bosatsu is also derived from Buddhist philosophy.



David Gilchrist,
Managing Director of Generation,
British Energy

British Energy

WANO Corporate Review



1. Torness NPP
2. Sizewell "B" NPP

In July 2001 British Energy, the UK's biggest generator, was the first nuclear operator outside North America to undertake a WANO corporate review. The experience was repeated in June 2003 and the company is now following up on the findings.

The Institute of Nuclear Power Operations has carried out 119 corporate reviews covering many US utilities, most recently at Exelon, Entergy, Detroit Edison and First Energy. Outside the US, only Canada (OPG) and now British Energy have had corporate reviews. EDF is planning one in 2004 and there may be others in the near future.

So why would an organisation like BE subject itself to such a rigorous corporate review?

"It is not easy and the messages are very hard but the benefits are priceless," says British Energy's Managing Director of Generation David Gilchrist. "How else would we get constructive guidance from respected and experienced people who have undergone the same challenges themselves?"

The review earmarked six areas for improvement and BE has since been developing and deploying improvement plans to address them. The areas for improvement reflect issues of a cultural and strategic nature therefore a 'quick fix' based on hundreds of low level activities was out of the question.

"The obvious trap is to try and sort everything by delegation. This was not going to be appropriate for us, and as it turned out 2002/3 was an exceptionally challenging year for BE with serious market pressures and financial issues to contend with."

"With all this going on, safe, reliable generation remained our overriding objective. We remain committed to our

British Energy is the UK's biggest generator. It operates seven AGR stations and one PWR station, producing around 67TWh each year – some 20 percent of the UK's total electricity requirements. BE was formed by the merger of two organisations – Nuclear Electric and Scottish Nuclear – at the time of the privatisation of the UK electricity supply industry in the 1990s.

two challenges: Operating to world best standards of safety and reliability; and being cost competitive in the UK electricity market."

BE went on to identify the four key areas – "fundamentals" – to be tackled. These were Human Performance, Equipment Reliability, Management of Work and Operational Focus.

The latest review showed that while BE was targeting the correct issues, the company wasn't seeing significant improvements; 'strong on strategy, weak on deployment'. BE has decided to bring in partners to help deliver the rapid recovery required. The partners include experienced nuclear operators who are working alongside the BE line management team and deliver improvements based on their own experiences.

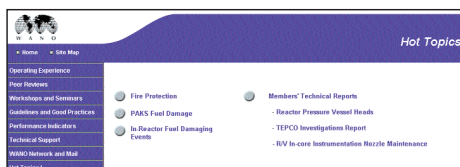
"As a UK generator we are now focused on producing an effective organisation, organised around the key goals of nuclear safety and reliability. We are applying cost pressures and seeking efficiencies across the business, particularly to overheads to generate extra resource which can be deployed on nuclear safety and operational issues. The plans are clear – the challenge is to just do it!"



Web Master
Richard Lawrence

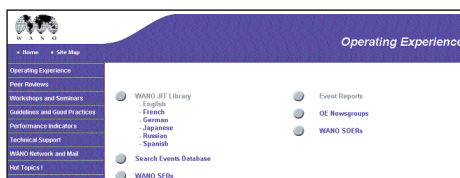
New additions

Hot Topics page



New to the Hot Topics homepage are several important subjects that will be of interest to WANO members. You may access the Hot Topics homepage from the button on the Home Page:

- Improving Operational Decision Making
- In-Reactor Fuel Damaging Events
- Paks Fuel Damage



Utility-Developed Briefing Sheets added to the Just- in-Time (JIT) Library

In response to industry feedback, utility-developed briefing sheets are being included with WANO JITs. These documents may be in a different format and continue to communicate operating experience and topical lessons learned.

Utility-submitted JITs may also be used during prejob briefings or included in station work packages to highlight industry Operating Experience with regard to a specific task. To access the JIT library, click on the button on the Operating Experience Home page.

Do you have any documents of interest to WANO Members?

Utilities interested in providing documents should submit them to OE@wanopc.org. The documents should be submitted as follows:

- Less than two pages long
- Should clearly describe a single type of activity
- Lessons learned should be included based on the analysis of the supporting operating experience
- Be submitted as a Microsoft® Word file

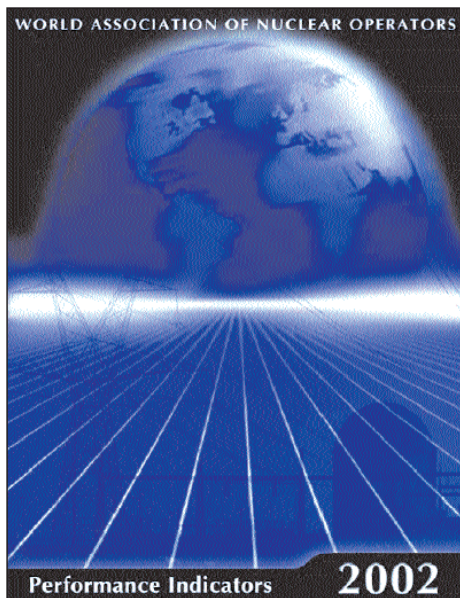
WANO will review each utility JIT, adding the appropriate disclaimer information, distribution limitations and the originating station or utility name. Utility JITs will be posted only in the language(s) in which they are submitted by the utility.

2002 Performance Indicator Tri-Fold

The 2002 PI Tri-Fold is on both the member and public Web sites and can be downloaded from both sites. Access the documents at: http://www.wano.org/PerformanceIndicators/PI_TriFold/PI_2002_TriFold.pdf for the Member site and http://www.wano.info/PerformanceIndicators/PI_TriFold/PI_2002_TriFold.pdf for the Public site.

Inside WANO on the web @ www.wano.info

Don't forget that Inside WANO is available on both the member and public Web sites. On the public site, just click on the publications button on the homepage. You can find all six language versions, including past issues. The public Web site requires no user ID, password or encryption software.



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Oleg Saraev

Message from the new WANO President



Oleg Saraev is Director General of Concern "Rosenergoatom", Minatom of Russia, Moscow. Prior to this appointment in 2000, he was Director of Beloyarsk nuclear power plant. He has served as a member and chairman of the WANO Moscow Centre governing board and a member of the WANO governing board. His career in the nuclear industry started at Beloyarsk nuclear power plant in 1966. He will serve as president until the next WANO Biennial General Meeting in October 2005.

After being in existence for half a century, the nuclear industry has experienced ups and downs in its development. It has come to an understanding of the need for steady and safe use of its potential. This is especially important now, when the world community is close to acknowledging nuclear power as an ecologically clean source of energy for the near and long-term future.

WANO's inception in 1989 was the worldwide manifestation of collective responsibility for nuclear power plant safety. Since then, our industry performance indicators have improved considerably. Nuclear power has not only become more safe and reliable, but also proved its economic effectiveness, successfully competing with other sources of electric power.

At the same time, new problems have appeared. Questions must be asked about the ageing of nuclear power plant units; the eventual loss of an experienced workforce; decommissioning; spent fuel reprocessing and radwaste treatment.

The increase in nuclear power plant capacity and life-time extension has been stimulated by economic pressure and deregulation of the energy market. The guarantee of safety and reliability at nuclear plants in these conditions remains paramount.

This is why the WANO mission remains as important now as it was in 1989 – to maximise the safety and reliability of the operation of nuclear power plants by exchanging information and encouraging communication, comparison, and emulation amongst its members.

Nuclear operators have united together voluntarily, and when doing so they consciously committed themselves to open exchange of information experience

exchange and mutual support of safe plant operations worldwide.

WANO's success radically depends on the trust which should exist in the relationship amongst members. This should be a climate of confidence and mutual respect, including respect of existing differences, particular needs and circumstances. Creating this climate in the first place depends on the WANO leadership of the WANO governing board and the regional centre governors.

As your President, in order to achieve the common goal of safe plant operation worldwide, I will strive to:

- strengthen this climate of confidence and mutual respect throughout WANO
- strengthen the awareness of the indispensable role of WANO for the present and the future and
- contribute to more active inter-regional support and cooperation with other international organisations.

The nuclear industry can and must play a key role to guarantee a reliable energy source for sustainable development of civilisation.



Ardela Daniels,
psychologist at WANO-Paris Centre



Human performance

The next step

It's been more than 10 years since the nuclear industry started focusing on improving human performance. Today, the emphasis on human performance is even stronger. Recent events reinforce the message that human performance has become a core strategy for maintaining and enhancing nuclear safety.

Where is human performance today?

There is a general agreement about the need for a systematic, practical approach to improving human performance. Most utilities use a range of human performance tools and techniques. Some are on the verge of making a step-change in their human performance programmes. The CEO of British Energy, Mike Alexander, has identified Human Performance as one of his company's key fundamentals for achieving overall performance improvement.

Why address human performance?

"The aim of human performance programmes is to minimise the frequency and severity of plant events. This is accomplished by focusing on some key behaviours for individuals, leaders and organisations. These behaviours are observable, trainable and reinforceable. Over the last decade, the industry has identified and sharpened those behaviours most likely to lead to error-free performance," says Ardelia Daniels, psychologist at WANO-Paris Centre.

What are the human performance tools?

Errors can be prevented, caught or mitigated. Examples of some of the human performance tools designed to prevent error include:

- Self checking
- Peer checking
- Three-way communication
- Procedure use and adherence
- Pre-job briefing
- Questioning attitude
- Use of operating experience
- Conservative decision making
- Supervisory monitoring

Does it work?

Evidence suggests that utilities with a consistent focus on improving human performance are reaping the benefits in terms of improved reactor safety and plant reliability. Their success has been gauged, in part, by a continuing decrease in the number of significant plant events.

What is WANO Paris Centre doing?

WANO Paris Centre has recently launched a service for plants wishing to initiate or improve their human performance systems. The service consists of the following:

- Human performance assist visit
- Formulation of an action plan
- Support service

Human performance assist visit

Ardela Daniels led the team that conducted the centre's first human performance assist visit at Dungeness B Power Station, UK in June 2003. According to Mark Gorry, the Station Director: "The WANO human performance assist visit was really excellent, leaving us with a well thought out, detailed action plan to move our human performance programme forward. The assist visit significantly exceeded my expectations, and I would recommend it to any plant wanting to accelerate its human performance programme."

The human performance assist visit is delivered by a team of six to eight human performance experts spending one week on site. The team identifies the human performance focus areas for the station. An action plan is formulated and agreed with the station leadership team. WANO provides support to the station for implementation of the plan, supplying tools and resources.

What is the next step?

Improving human performance demands change. It is not a process that can be implemented in a piecemeal fashion. WANO provides the platform for experience exchange of the industry's best practices in human performance.

Over the last decade, the industry has identified and sharpened those behaviours most likely to lead to error-free performance

Ardela Daniels,
psychologist at
WANO-Paris Centre

Michael Sharov

Michael Sharov is a full-scope simulator instructor at the Balakovo NPP Training Centre in Russia, where he has worked since obtaining his degree. He has experience from field operator to unit shift supervisor. Michael is currently involved with on-the-job training for engineers from Balakovo, Bushehr in Iran, Tianwan in China and other Russian NPPs. He has been a WANO peer reviewer five times.

Describe yourself in three ways.

I am interested in new discoveries, I am patient and level-headed in the evaluation of any given situation.

What made you choose to work in the nuclear industry?

As a student, nuclear energy seemed an advanced branch of industry in which to apply my knowledge and learn something new. I wanted to be involved in the cutting edge of industry and science.

What was your first WANO experience?

I was a member of the WANO peer review team at the Doel NPP in Belgium. I became aware of the significance of such reviews aimed at improved plant safety and performance. Additionally, I liked the unique atmosphere of cooperation among peers throughout the world.

When you were a child, what did you want to grow up to be?

I wanted to become a scientist as I enjoyed sciences. I used to take part in school contests in mathematics and physics. As an adult, I wanted to continue studying precise sciences and become a researcher.

What do you do to relax?

The best form of relaxation for me is jogging in summer and skiing in winter. Most important for me is to vary activities between mental and physical.

Who would you most like to have dinner with and why?

I most enjoy dining with my family, in the circle of dear and loved ones.

What is your favourite book?

The book I am currently reading, is "The Wheel of Time" by Robert Jordan.



Have you ever tripped or scrambled a reactor?

Yes, during planned shutdowns when it is a routine part of the outage process. The outage time comes, and the reactor is shut down, no problems here. A scram usually occurs automatically. It is rather difficult to find a person at the plant who has ever initiated a reactor trip.

If you had to write your motto in one sentence, what would it be?

Everything in life is possible!

Inside WANO is published three times a year by the World Association of Nuclear Operators for all its members.

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