



WESTINGHOUSE WORLD VIEW



Westinghouse

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Cover: With 58 operating plants, France obtains about 78 percent of its electricity from nuclear energy and exports 10 percent of its nuclear generation to neighboring countries. In recent years, Westinghouse has participated in the French nuclear market with fuel and services.

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France is the world's leading producer of nuclear energy. Westinghouse supplies products and services that combine the strengths of worldwide experience and resources with a knowledge of the French industry's particular requirements.

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PlasmaBond, a thin metal coating that can be applied to virtually any surface, provides superior lubrication for many nuclear and fossil fuel plant components.

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PREPARE FOR THE BEST

Marilyn Kray
President
NuStart Energy

As an indication of our safety culture, the nuclear industry spends considerable effort in planning for the worst. Now, it is time to also plan for the best.

In the United States, the best is the scenario where nuclear energy is called upon to meet the country's growing electricity needs, and the industry is positioned to meet these new demands.

U.S. Reliance on Nuclear Power

The failure to plan for this future will have a great impact on the U.S. A number of convergent factors make it evident that an increased reliance on nuclear power will be necessary. These factors include the growing demand for electricity, the need for fuel diversity and a heightened concern for the environment.

The safety and financial performance of the current fleet of plants has made nuclear power worthy of consideration by numerous stakeholders, ranging from the President to congressional policy makers, the financial community, and even environmental groups. Each is sending a signal to the nuclear industry that it is time to prepare for the next generation of plants. In some cases, this signal is a clear assertion of the role of nuclear power in the overall gen-

eration portfolio. In other cases, it may be no more than an acknowledgement of nuclear power's role in a clean air emissions strategy, and a corresponding tolerance.

Industry Response

There are challenges that could inhibit the viability of nuclear investments in the future. The industry and the government are addressing aspects of these challenges, such as spent fuel disposal. There are two challenges not being addressed by ongoing initiatives that require prompt action.

These two challenges are: 1) the uncertainty of the regulatory process for licensing new plants and 2) completing the designs for advanced reactor technologies. Given the generic and one-time nature of these challenges, it appears that the best strategy for addressing them is through a unified industry effort.

Accordingly, the NuStart consortium was formed. The consortium companies are: Constellation, Duke, EDF International North America, Entergy, Exelon, Florida Power and Light, Progress, Southern, Tennessee Valley Authority, Westinghouse and General Electric.

Specifically, the NuStart objectives are to complete the advanced

designs of the Westinghouse Advanced Passive (AP1000) reactor and the General Electric Economic Simplified Boiling Water Reactor (ESBWR).

In addition, NuStart plans to demonstrate the licensing process by preparing Combined Operating License (COL) applications for each technology and submitting them to the U.S. Nuclear Regulatory Commission for review and approval. In a 50/50 cost-sharing arrangement, NuStart is receiving funding from the U.S. Department of Energy under the Nuclear Power 2010 Program.

By completing these objectives, we will significantly reduce the time to market for a new plant. Additionally, each technology will be poised for commercial deployment. By planning for the best, we will avoid the situation where the nuclear industry is called upon to sustain its contribution to the overall electricity supply by building new plants, but we are unable to deliver. We will be ready. •



Marilyn Kray

A photograph of a nuclear power plant with two large cooling towers emitting white steam. The plant is situated on a grassy bank next to a body of water, which reflects the towers and the sky. The sky is blue with scattered white clouds. In the foreground, dark green leaves of a tree are visible on the left side, partially framing the scene.

A GLOBAL REACH A LOCAL PERSPECTIVE

Westinghouse provides a wide range of products and services to the French nuclear industry; with global resources and decades of experience adapted to the character of the local marketplace.

*Mobile fuel rod assembly
inspection system.*

Seventy-eight percent of the electricity generated in France in 2004 was fueled by nuclear energy. Of the remaining electrical generation, 12 percent was from hydroelectric plants, 5 percent was derived from coal, 1 percent from oil and 4 percent from natural gas. In addition to meeting its own electrical needs, France exports 10 percent of its electrical production to other European nations.

French utility Electricité de France (EDF) is the largest and among the most respected nuclear generators in the world. EDF is presently government owned, but a maximum of 30 percent of the company (10 billion euros maximum) will be offered in stock to private investors by the end of 2005.

The French electricity market is also undergoing dramatic changes. The marketplace was partially opened to suppliers from outside the country in 2004 to fulfill European Commission directives regarding international competition. The complete opening to foreign competition is expected by 2007.

There are 58 nuclear power plants in France; these are Framatome-designed pressurized water reactors based on Westinghouse nuclear steam supply system technology. Among the first orders placed after the opening of the French nuclear fuel market in 2004 was

for Westinghouse to provide EDF with 1,522 fuel assemblies for the utility's 900 MWe and 1300 MWe nuclear plants located throughout France. This created the opportunity for EDF to also have access to the full range of Westinghouse nuclear fuel technology.

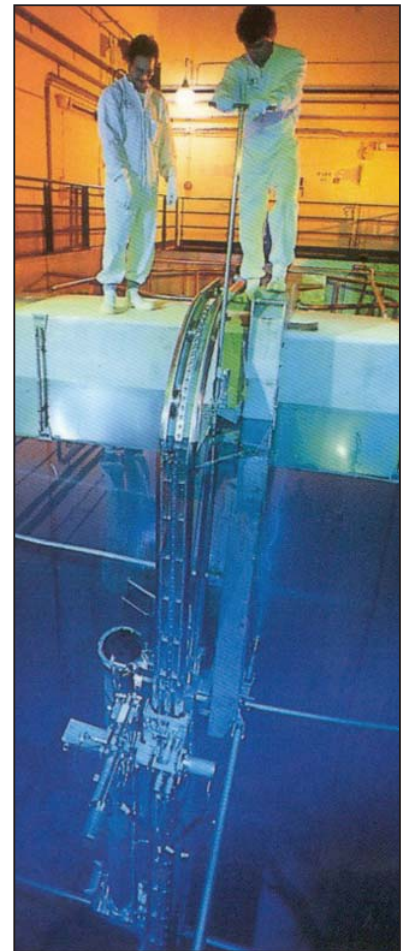
Westinghouse Presence in France

Today, Westinghouse has approximately 160 employees in France working for Westinghouse Barras Provence and Westinghouse Logitest. There are two main locations: one at Les Ulis, near Paris, and the other at Manosque, near Marseille. Also, a Westinghouse team located in Metz is in charge of repair, replacement and automation services. A facility dedicated to engineering development and services will be located in Marseille.

On a global basis, many other Westinghouse organizations participate in the French marketplace. These include Westinghouse Sweden; WesDyne, a wholly owned subsidiary; Westinghouse Belgium, and Westinghouse Germany.

Nuclear Fuel

Westinghouse supplies fuel assemblies through a joint venture with ENUSA, called the European Fuel Group (EFG). EFG currently supplies 20 percent of the French fuel market.



This fuel activity represents two-thirds of Westinghouse's business in France.

Through this joint venture, EFG, Westinghouse and ENUSA provide French fuel from two locations: one located in Västerås, Sweden, and the other located in Juzbado, Spain. Currently, Västerås provides most of the 900 MWe reloads and Juzbado most of the 1300 MWe reloads.

Among the innovations that accompanied this greater fuel activity is a newly designed transport packaging for fresh fuel assemblies called the TravellerTM. This packaging has been licensed by the U.S. Nuclear Regulatory Commission in 2005 and validated recently in

several European countries, including France. The first shipment using Traveller was in mid-June 2005 to the Gravelines plant.

With 20 percent of the fuel assemblies for France's nuclear reactors, the establishment of an in-country refueling organization was completed in June 2005 and will be fully operational by the end of the year. This fuel-service activity includes capabilities for fuel inspections for data collection as well as the treatment of improbable incidents such as leaking rods.

Nuclear Services

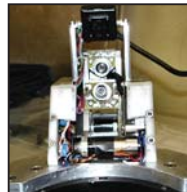
The other third of Westinghouse's business activity in France is in the service area. This consists primarily of steam generator services and nondestructive examinations such as eddy current, ultrasonic and television/dye penetrant testing (PT).

For example:

- A five-year contract was signed with EDF, and implementation began in January 2005, for eddy current inspections of the steam generator primary side at a number of

nuclear facilities. Westinghouse currently performs 50 percent of these inspection services in France.

- Another contract is for PT tests and ultrasonic testing of the steam generator partition plate. To date, testing has been completed at the Chinon, Golfech and Blayais nuclear plants.
- The first ultrasonic inspection of RCV primary piping was performed in April 2005 at the nuclear plant at Cruas.
- A modular system for inspection and brushing of penetrations is called SIMBA (Système d'Inspection Modulaire et de Brossage des Adaptateurs). The system will be used to perform 10 canopy seal weld inspections this year, including seven complete reactor vessel head control operations. Approximately 10 such inspections are planned for 2006.
- A dedicated team of Westinghouse personnel in France performs maintenance for reactor coolant pumps.



The French market for primary pump maintenance was previously dominated by the original pump manufacturer; now there is a reliable competitive alternative.

Westinghouse will increasingly perform integrated services during refueling outages. This will permit the Company to bring to EDF the experience gathered over many years in the U.S. and other countries; and should contribute significantly to the shortening of outage periods.

Global Perspective

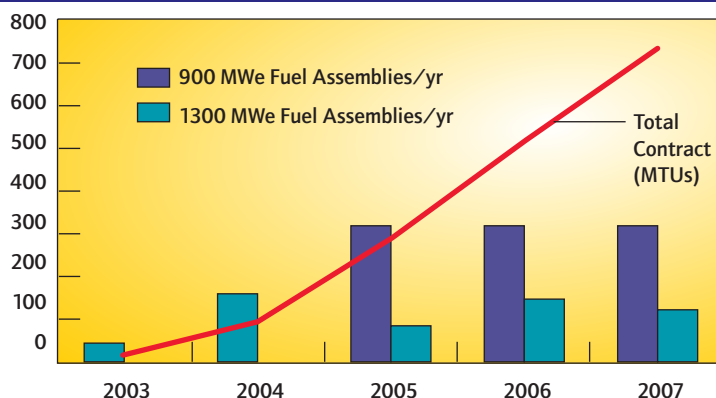
Westinghouse is a global company in many respects. It shares a worldwide technological experience, is able to amortize developments of tooling over a large number of plants, and is able to share resources across borders and oceans. Today, Swedish, German, Belgian, Spanish and American technicians are working side-by-side with French personnel in a number of French nuclear power plants.

But Westinghouse is also local in nature with in-country representatives, French-speaking operators on work teams, a reliance on a French team in charge of local health physics and country regulations, and French commercial counterparts to EDF personnel.

Here are several examples of this blending of local and global characters:

- Amortization of Product Development: Pegasys® is a small robot used for eddy current inspections, small-scale plugging, in-situ leak testing and other non-destructive

The EDF fuel contract significantly impacts Westinghouse's share of the European PWR fuel market.



examinations. It was first developed in the U.S. but has now found increased application in Europe, Germany, Belgium and now France. In anticipation of the expected growth in applications for these small robots, Westinghouse is manufacturing 15 more units specifically for use in Europe.

- **Sharing of Resources:** During short "peak" periods, Westinghouse reinforces its "data room" personnel with American and Spanish technicians to help support the team of French analysts.
- **Integrated Services Based on Global Experience:** A recently completed study, named MO2 (Management Outage Optimization), will be used to provide the experience of dramatic reductions in outage durations achieved in the U.S. nuclear industry to the fleet of EDF plants.

Nuclear Energy's Future in France

France is making large investments in its nuclear future. This includes a planned new reactor, the EPR; a centrifugation enrichment plant; research reactors; and the recently announced fusion reactor. In addition, it is expected that in 2007 or 2008 EDF will make a decision on a new generation of plants to become operational by 2020.

In order to prepare for this investment in a new generation of plants and be ready to enlarge its possible choices, EDF has joined the NuStart Energy Development LLC consortium that is testing the licensing

SPIRIT OF COOPERATION

"I worked with Westinghouse Logitest on the last two outages at Dampierre Unit 4; the 10-year outage in 2004 and the reloading outage in 2005. Despite a few temporary technical concerns and an accelerated planning schedule, these outages went extremely well.

"Much of this can be attributed to two things. First, the ability of Westinghouse to rapidly re-organize their manpower and resources. And second, to the excellent interaction we had during both the outage preparation and its implementation. This spirit of cooperation and compromise on both our parts allowed us to build a realistic work schedule compatible with our timetable and budget objectives.

"Westinghouse's strengths are its ability to propose realistic planning, optimize the use of its resources and technologies, and employ the best possible organization. In the future, we would expect the company to contribute their national and international experience – by sharing best practices from other plants here in France and also in other countries – to shorten outage schedules."

Jean-Emmanuel Carlotti, Outage Supervisor,
Dampierre nuclear power plant

process for new nuclear power plant designs. The consortium is pursuing a Combined Construction and Operating License (COL) for two Generation III nuclear power plant designs – Westinghouse's AP1000 and General Electric's ESBWR. (See Viewpoint on page 3)

Westinghouse is already planning to expand its resources in France to participate in this dramatic growth. A new facility in Marseille will be devoted to the development of engineering activities with a team of highly experienced engineers. There will be a need for engineering studies to support the replacement of steam generators, sumps and other components. There will also be a growing need for integrated services and the potential value of upratings of

existing plants to provide greater efficiencies and electrical generation.

In the coming decades, France – indeed, all of Europe – will need to increase or at the least maintain by plant license renewals its production of nuclear electricity to maintain power supplies that are clean, safe, secure and affordable. Westinghouse intends to participate in this nuclear future with a base of global strengths and resources leveraged with an awareness of best practices in each country. From this broader perspective, the business of servicing the customer's needs becomes the predominant concern – not geography. •

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THIN PLASMA BOND COATING PROVIDES SUPERIOR LUBRICATION

EDITOR'S NOTE: The PlasmaBond technology is a patented process developed by TXU Generation Services (TXU GSC). Mobile services are provided to nuclear generating facilities exclusively through a marketing agreement between Westinghouse and TXU GSC.

The PlasmaBond lubrication coating is used in the power industry for a wide range of nuclear and fossil fuel components. PlasmaBond has proven to lower maintenance costs, extend equipment life and reduce downtime for many plants.

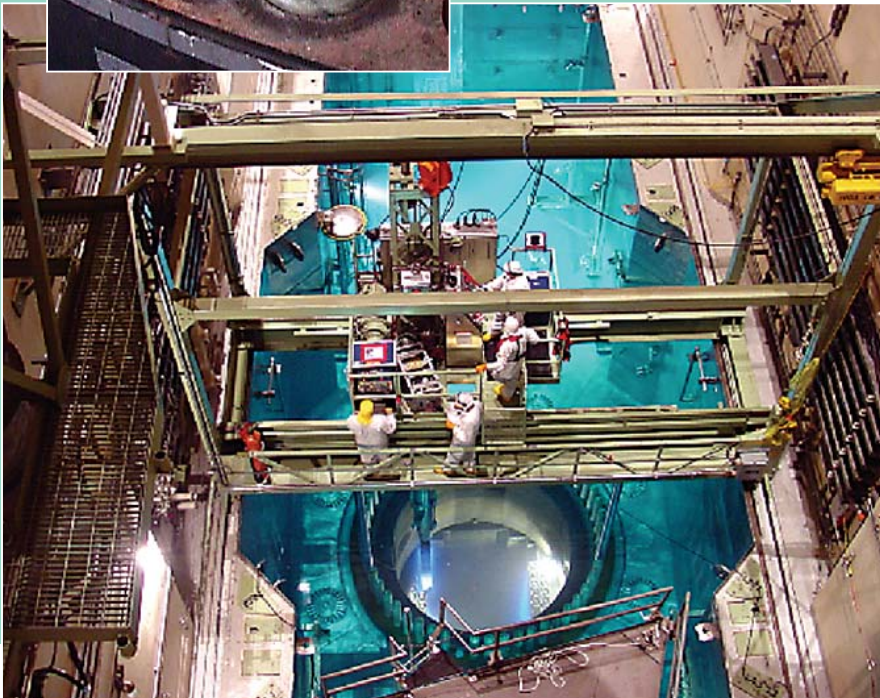
PlasmaBond is a process that applies a thin, 3,000- to 7,500-angstroms thick, metal coating to virtually any surface. The metal film bonds to the surface of the substrate and acts as an exceptional lubricant. In fact, results from controlled tests and field experiences have confirmed that PlasmaBond-treated surfaces provide exceptional protection against galling, and outperform any other lubricant currently used in the commercial nuclear industry.

In addition, unlike conventional lubricants, PlasmaBond coatings do not migrate away from the component surface, and they are not affected by heat, load or the length of time between maintenance service periods.

Here is an illustration of the potential of PlasmaBond: Life-cycle testing confirmed that coated tensioned fasteners



*Installing stud canisters
at Comanche Peak prior
to refueling.*



There are approximately 50,000 PlasmaBond-coated components currently in use at utilities across the U.S., representing both safety-related and non-safety-related nuclear applications. PlasmaBond coatings can be applied to virtually any surface and are engineered for specific applications where conventional lubricants may not be effective or may even be undesirable.

NUCLEAR PRIMARY	NUCLEAR NON-PRIMARY	OTHER APPLICATIONS
Reactor Vessel Studs	Turbine Coupling Studs	Inspection Port Plugs
Steam Generator Studs	Pump Casing Studs	Boiler Plate Plugs
Steam Generator Hand Hole Bolts	Valve Trim Parts	Pump Bearing Nuts
Refueling Tools	Pump Shaft Sleeves	Valve Trim Parts
Upender Release Pins	Flange Coupling Bolts	Gas Turbine Igniter
PORV Body Flange Bolts	Turning Gear Components	Down Well Sleeves
MOV Valve Disks	Security Door Striker Plates	Turbine Coupling Studs

(studs) can be used for ten consecutive cycles before they need to be re-coated. Additional tests showed that PlasmaBond-lubricated, torqued-threaded fasteners were re-used for four to six successive cycles before the lubricant required re-evaluation to determine if a reapplication was needed.

Eliminating Costly Headaches

A stuck fastener on any major component adds cost and duration to an outage. For example, prior to the use of PlasmaBond at TXU Power's Comanche Peak nuclear plant in Texas, stuck studs were a common, unavoidable and unpredictable problem. When conventional lubricants hardened around the reactor vessel stud cap threads, producing an adhesive-like substance,

the reactor vessel studs would become stuck. It's estimated that a stuck reactor vessel stud adds approximately \$1.5 million to the cost of an outage.

One Step Further

Since PlasmaBond eliminated the need to remove, clean and re-lubricate the reactor pressure vessel studs during each refueling, Westinghouse developed a stud enclosure system (stud can) to enable the studs to remain in the flange during the refueling outage. The stud can provides an airtight seal against the reactor vessel flange; the studs are kept clean and dry.

The stud can is an effective way to further reduce critical path time, ALARA dose and overall outage costs. Comanche Peak estimates that the combined use

of stud cans and PlasmaBond on the reactor studs saves as much as 16 hours of critical path time during each outage.

Clean, non-contaminated parts can be coated at the PlasmaBond Service Center located in Glen Rose, Texas. For time-critical projects and applications, coating services can be performed at a plant site using PlasmaBond Mobile Services. When necessary, a mobile facility can be located at the Westinghouse Waltz Mill Site in Pennsylvania to treat contaminated components. •

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* Related article on page 27.



The vacuum coating process molecularly bonds the PlasmaBond metal film to the substrate. The ion plating, patented by TXU GSC, is performed in a vacuum. It deposits a layer of metal that is less than 10,000 angstroms thick.

THE JOURNEY TO CUSTOMER 1ST

FROM IDEA TO REALITY

Over two years ago, Westinghouse embarked on a journey called Customer 1st. Its aim was to dramatically refocus the company by concentrating our efforts on improving the way we work for and with our customers. *World View* talked with Dan Lipman, who led the initiative over the past year, to assess the path traveled so far, the roads still anticipated in the future, and the new Westinghouse on the horizon.

Customer 1st has been portrayed in many ways ... as a journey, a vision and, practically speaking, as a means of behaving differently, working differently and thinking differently. **How do you see Customer 1st?**

"Customer 1st is all these things, and more. Perhaps for the first time, Westinghouse has committed to changing in a systematic way that puts customer needs, customer success, customer drivers at the heart of our business. This change starts at the very top; the entire leadership of Westinghouse is committed to Customer 1st as a way of doing business.

"Customer 1st quite simply is the way we are going to run this company today and in the future.

"The goal of Customer 1st is to focus on the issues that are important to our customers and behave in a manner customers expect of their key suppliers."

How is Customer 1st different from other so-called "programs of the month?" **Is Westinghouse committed to dramatically changing its culture?**

"It stops being another program if you run your business according to Customer 1st principles; if it becomes embedded in the organization. This has been accomplished to some extent already.

"We've had people go through the two-year Customer 1st Leader experience, and they are beginning to return back to positions where they can apply the principles they learned.

"Customer 1st is a huge investment. It's an investment not only of money and infrastructure, but it is an investment most of all in people. It goes to the very heart of the issue that we are willing to invest this much by taking key people out of their assignment, and for two years have them working on nothing but continuous improvement and making our business better.

"Let me be blunt. Having great technology is the price of admission in our industry. Competing on lowest price is a loser's game.

So all that's left is competing in a way that encourages customers to really want to do business with you. I think that analogy applies very much both to the United States and to world-wide utility markets.

"Generally speaking, the nuclear power industry has several key tenets that are shared globally: safety, reliability and economic efficiency. How customers in each country or region buy products and services and how they like to interact with their vendors can be quite different. As a global company, we understand, appreciate and respond to those differences ... that is what Customer 1st means."

How do you determine the right problems to fix? What areas demand change more urgently?

"A second way Customer 1st has become embedded in the organization is through project execution and the sustained improvements that they have achieved. These are meaningful projects aligned with company strategy that keep the business on a path of continuous improvement.

"We have formalized our system of selecting projects to ensure that they are of vital interest to our business and our customers. It starts with what are known as flowdowns — factors critical to success, critical to quality, critical to satisfaction. These are strategic imperatives for each business. Determining which of these factors are most critical provides us with an understanding of where to direct our project focus.

"In addition to over 115 Customer 1st Leaders, there are about 20 Master Customer 1st Leaders within each major business unit focused on three things: strategy, projects and people. Master Customer 1st Leaders are experts in change management. They are responsible for understanding the business, making sure that projects are aligned with strategic imperatives, and working with management to provide the resources to get the job done.

"A second type of Master Customer 1st Leader is integral to a newly formed technical resources group. This leader is responsible for benchmarking, identifying best practices and teaching Customer 1st methods throughout the company.

"A lot has been accomplished in the last two years, but much remains to be done. One thing is certain, we will never run out of projects. The bar for performance continues to be raised by utilities. What's good today, and what's good next year, won't be good enough in three years.

"The other thing is that our customers feel pressure to be perfect; and perfection is something we also need to aspire to."

Talk about "customer delighters."

"Everyone talks a lot about customer satisfaction. But I like the term customer delight. Satisfied is one thing; to be delighted is something else. Like perfection, delight is a pretty high standard. To focus on customer delight is not only an aspirational goal, but an achievable goal. Customer delight is the rallying principle behind becoming a customer-centric organization. It's about performance, not about managing perceptions.

"I've been delighted to find that customers can be delighted. This is a tough business, and delight is not something that nuclear industry professionals show quite readily. As one customer said, 'the absence of problems is delight.'"



It stops being another program if you run your business according to Customer 1st principles.

I like the term
customer delight.
Satisfied is one thing;
to be delighted is
something else.



Can Customer 1st play a role in the resurgence of nuclear power?

"That's an interesting question. Westinghouse has furnished equipment for new plants in Korea and we continue to do so; however, we have not supplied a turnkey plant to a customer in many years. Engineering and manufacturing procurement processes and procedures have evolved as customers operate their existing units.

"The first Customer 1st project I asked to be implemented in my new position as vice president of our nuclear power plants business is to start with a clean sheet of paper and use Customer 1st tools and methods and apply them to create engineering and construction accountabilities for new nuclear plants."

Let's look ahead. If things go as you anticipate, how will Westinghouse be different five years from now?

"Let me address the near term first. The first class of Customer 1st Leaders, having completed their two-year assignments, is going back into our many businesses this fall. The second

class of leaders will return to the businesses this winter. By applying what they have learned, these men and women should add significantly to change the way we're managing our business.

"Beyond this immediate future, the Westinghouse of tomorrow will be characterized along four major dimensions: organizational alignment, projects and project execution, Customer 1st methods and systems, and, most important, customers.

"We will become self-sufficient in Customer 1st methodology, systems and teaching. As a result, we will deploy Six Sigma, Lean and human performance tools at a far greater level and depth than they are now.

"We anticipate that in the future 20 to 25 percent of our projects will be done with customers - at customer locations. Customer 1st methods such as value stream maps would be applied to customer operations. So in five years, we would really be focusing even more intently on customers, and being closer to them.

CUSTOMER 1st MILESTONES

Customer 1st was officially started in May 2003. Since then:

- There have been more than 800 Customer 1st projects, either in-process or completed, affecting virtually every business activity.
- There are currently more than 115 Customer 1st Leaders and 20 Master Customer 1st Leaders.
- The first class of 23 Customer 1st Leaders return to business units this fall. The second class of 21 will "graduate" this winter.
- Over 20 Master Customer 1st Leaders are assigned to line vice presidents to manage change for their business activity.
- There currently are about 130 "greenbelt" employees, trained in Customer 1st methods and responsible for project implementation, but remaining in their current positions.
- The Customer Advisory Board was established to provide guidance and feedback.
- An in-house capability has been established to teach Six Sigma, Lean techniques and other Customer 1st methods.
- Behavioral differentiation training will be conducted for approximately 1200 employees beginning this summer.

"We hope that within five years 40 percent of our leadership council will have gone through the Customer 1st experience. Demographically, about 55 percent of the Leadership Council is eligible for retirement in five years. If you do the math, that means virtually everyone new on the council will be a disciple of Customer 1st.

"Customer 1st is the embodiment of the transformation that we needed here in Westinghouse as we have gone from being a \$900 million a year company to a multi-billion dollar a year company. Customer 1st is a common language that binds together a globally far-flung organization. This takes on added significance as the company begins the process of finding a buyer. Today's Westinghouse is strong, profitable and positioned to sustain its leadership role in the nuclear industry.

"Customer 1st is a continuing promise. A promise to listen to our customers and act to meet their needs and expectations. A promise to encourage employee participation and assure them that the company is focused on strategies that improve the business. Together, we can help fulfill the larger promise of nuclear generation to power global growth and prosperity." •



Jack Allen



Customer 1st is ...

**a promise to listen to our customers and
act to meet their needs and expectations.**



ORGANIZATIONAL CHANGES

I would like to announce two very important leadership changes that will help to intensify our Customer 1st effort while continuing our strong focus on the fast-emerging new plant segment of our marketplace.

Effective May 1, Jack Allen was appointed senior vice president, Operational Excellence, and Dan Lipman assumed Jack's assignment as senior vice president, Nuclear Power Plants business unit.

Jack now leads our Customer 1st efforts. It is vital for the entire Westinghouse senior staff to develop change management skills by leading our global Customer 1st initiative.

Dan assumes his new role at a time when interest in and scrutiny of the new plant segment of the nuclear power market is at a level not experienced since perhaps the mid 1970s.

In addition to future new plants in China, there are business opportunities now emerging in the United States.

Steve Tritch

Steve Tritch
President & CEO



ENERGY IN THE NORDIC REGION:

PARADOX AND PROMISE

Ronald Hagberth
Past President
Sydkraft Kärnkraft AB

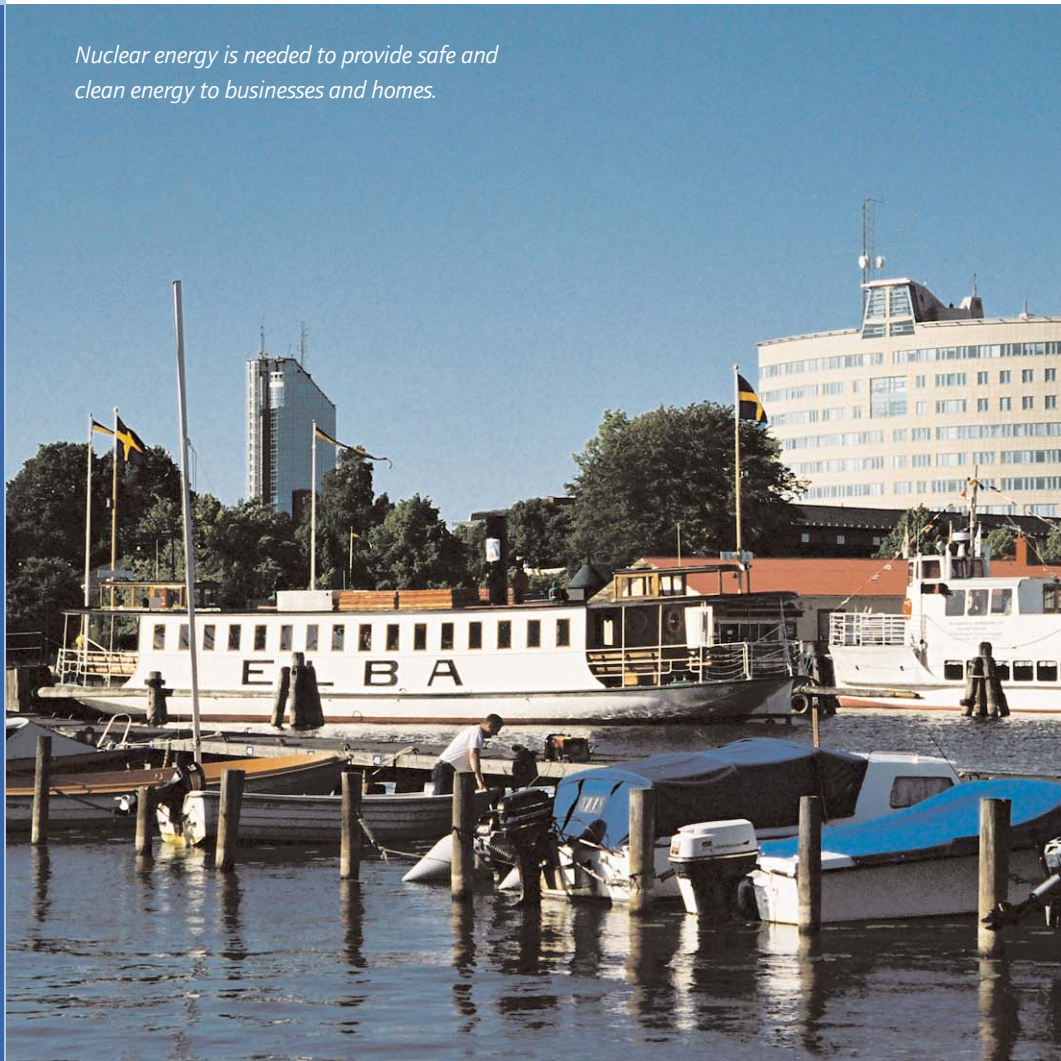


A Region Perspective:

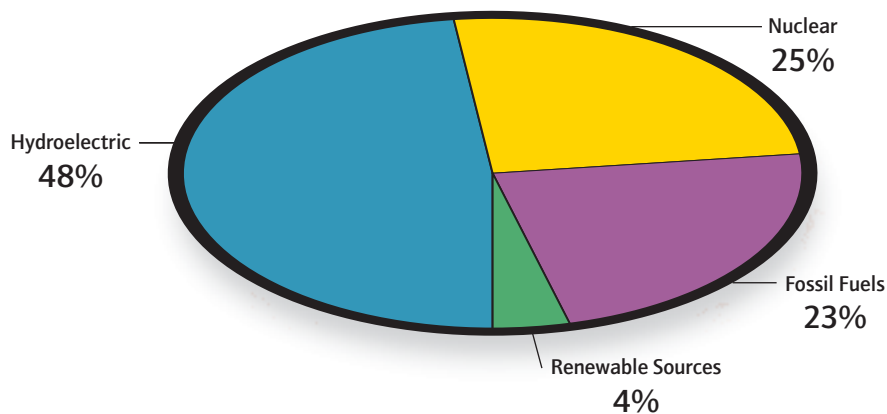
A Nordic identity is built on a common culture, geography and history. It is reflected in the flags of the five countries:

each has its own distinguishing colors, but they all share the design of a cross on a plain background. Perhaps the most pressing challenge the Region faces today is to achieve balanced economic, ecological and socially sustainable growth. This will demand the continued availability of clean and economical energy.

Nuclear energy is needed to provide safe and clean energy to businesses and homes.



The Nordic countries, consisting of Denmark, Finland, Iceland, Norway and Sweden, have well developed energy sectors, with similarities and differences that permit an effective exploitation of the overall energy system. A joint objective is to promote an effective, competitive, safe and sustainable supply of energy in an economic and environmentally responsible way.



Percentage of energy consumption in the Nordic Region currently supplied by various sources

The Situation Today

In 2004, electricity consumption in the Nordic Region totaled 390 terrawatt hours. Forty-eight percent was generated from hydroelectric power; 25 percent from nuclear; 23 percent from fossil fuels, primarily coal; and 4 percent was from renewable sources.

In Sweden, the production of nuclear energy achieved record highs in 2004 and supplied more than 50 percent of the electricity consumed in the country. Last year, the nuclear fleet of 11 reactors produced a record 75 terawatt hours. Availability factors averaged 91.2 percent, also a record high. This amounted to 8300 kilowatt hours per capita; this is the highest per capita nuclear consumption of any country in the world.

Demand for energy in the Region is expected to grow from one-half to one percent a year to meet the increased demands of the Region's homes, businesses and factories.

Paradox in Sweden

The figures paint a promising future for nuclear energy. But despite these hard economic facts and figures, the government has already shut down needed nuclear capacity in Sweden and plans to permanently shut down more plants in the future.

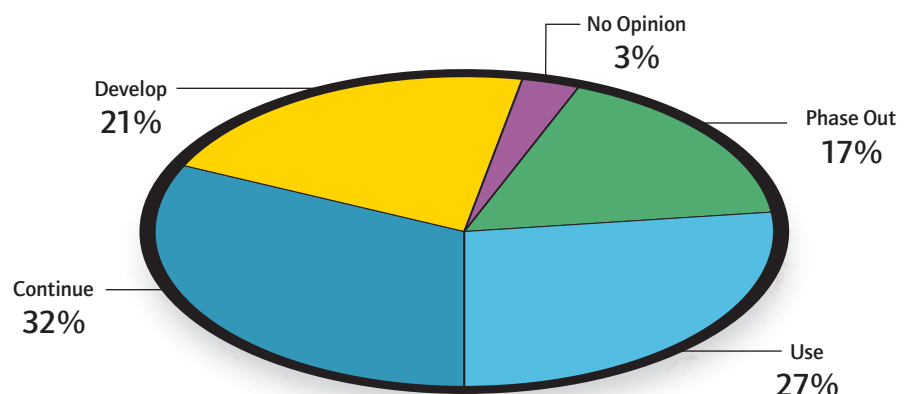
The nation's Nuclear Closing Act, created in 1997, gives the government the power to close nuclear plants with the proviso that the owners be compensated. As a result, the Barsebäck Unit 1 power plant was prematurely closed in November 1999.

In 2002, the government attempted to negotiate a compromise solution with the nuclear industry, but these negotiations were abandoned in October 2004. The situation is currently at an impasse with government policy on the one hand, and public and economic pressures on the other.

It is important to note that this political policy was not warranted in the opinion of the majority of Swedish citizens. The results of a Gallup Poll showed that 80 percent of the population favored the use of nuclear energy. In fact, of these, 21 percent suggested the development of additional nuclear capacity.

Yet the government elected to close Barsebäck Unit 2 in May 2005. The owners of Barsebäck,

A large majority of Swedish citizens favor the continued use of nuclear energy to meet the country's demand for electricity. Approximately 17 percent would favor building new nuclear plants to meet the country's growing energy needs in the future.



Vattenfall and Sydkraft will be compensated; Sydkraft by a higher ownership stake in the Ringhals Group and Vattenfall in cash. With demand for electricity in the region growing at about 1 percent a year, the decision to close the second nuclear unit in Barsebäck will cause a shortage of power in the Nordic Region; and more electricity will have to be imported from Russia and Poland.

Capacity Increases Lie Ahead

Meanwhile, construction of Olkiluoto 3, the fifth Finnish reactor, is proceeding with strong political support. Finland is heavily dependent on energy imports. Excavation for the 1600 megawatt reactor was finished in December 2004, and construction was begun in March of 2005. Commercial operation is expected to commence in 2009. There is also a new 1000 megawatt electrical cable to run between Finland and Sweden.

In Sweden, nuclear plants are being modernized and uprated. The goal is to achieve plant lifetimes of 60 years. Upgradings are achieved under the new regulatory guidelines established for 2005 and beyond. The objective is to upgrade older nuclear reactors to the same levels of safety as new units. Modernization includes the replacement of turbines, generators, instrumentation and control systems, and other major components.

The six youngest reactors in Sweden will be upgraded by 170 to 250 megawatts each ... totalling an additional 1300 megawatts of needed capacity, the equivalent of a new nuclear plant. Two reactors, Ringhals 3 and Oskarshamn 3, have already applied for government licenses to upgrade. All upgrades are expected to be completed between 2005 and 2011.

Difficult Choices?

Governments in the Region as well as other parts of Europe must make critical decisions involving their energy future. In truth, there are only a limited number of options if policymakers are to (1) address the challenges of reducing CO₂ emissions, (2) ensure the security of the energy supply, and (3) fill the demand for energy to sustain economic growth.

Many hope that renewable energy will make a significant contribution toward future power requirements. In 2004, renewable sources of fuel supplied about four percent of the Region's electricity, a small fraction of the present – let alone the future – energy needs. It is difficult to conceive that in the next 20 years other sources of energy will replace the annual totals contributed by nuclear energy.

The political debate seems to ignore the vital role energy plays in the world's hopes for greater economic development and environmental renewal. Political actions have a profound effect on the Region's economy, on its prosperity and on the standard of living of its citizens.

The answer is to use a mix of energy sources including nuclear. Further nuclear plant closures will be difficult to justify economically. In Sweden, for example, no "clean" alternative capacity has been created, and there has been no reduction in consumption.

The realities call for the promotion of a broad and dispassionate public debate on the Nordic Region's energy future.

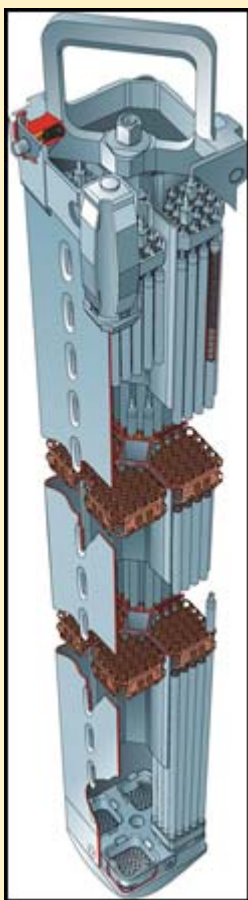
The Broader Community

Now the Nordic countries are being asked to adopt a third identity: a European one. Sweden and Denmark are members of the European Union. Norway and Iceland are not. Cautiously, they all seem to be edging closer, and are trying to define their places in Europe.

The effects of the Nordic Region's energy policies have ramifications elsewhere in the larger European Community. Economic integration and globalization pose long-term challenges that will necessitate reliable sources of safe, clean and competitive energy to power the Region's economy in the decades ahead. •

Ronald Hagberth retired in 2005 after serving as president of Sydkraft Kärnkraft AB since 2001. Mr. Hagberth was previously president of OKG AB (Oskarshamn Nuclear Power Station) with three nuclear units and a Central Storage for the Swedish Spent Fuel (CLAB).

NEW THERMAL-HYDRAULIC METHODS ENHANCE FUEL PERFORMANCE AND REDUCE LIFE-CYCLE COSTS



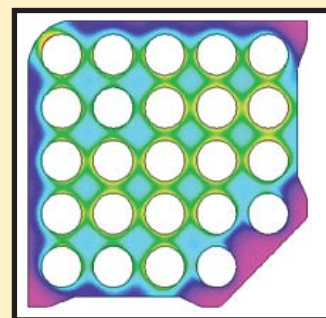
*Westinghouse
SVEA-96
Optima2
BWR fuel
assembly.*

Much is demanded of nuclear fuel in today's plant operating environment; it must burn more efficiently and perform flawlessly. This, in turn, demands new approaches and thinking to develop methods and methodologies that maximize fuel value.

In a boiling water reactor, fuel is cooled by a mixture of steam and water. Under certain steady-state or transient conditions, liquid film on the surface of the fuel rod might completely evaporate, causing a condition called dryout. Dryout diminishes heat removal capacity and increases the risk of fuel failures. Update possibilities for many BWR plants are limited by dryout.

Assessing the Risk of Dryout

When a BWR fuel design is licensed, it is licensed in conjunction with a specified method to predict its susceptibility to dryout. Currently, the assessment of dryout risk is based on unphysical correlations and overly conservative methodologies. This poses unnecessary limitations on today's plant



*Flow pattern in BWR
fuel channel.*

operators seeking to obtain additional value from their fuel.

While traditional empirical approaches and correlations provide an excellent fit to experimental data, they result in inaccurate or non-physical predictions in certain portions of the reactor operating space.

A second limitation of current methods is their inflexibility. They simply require too much development time and cost to respond quickly to changing operational concerns. The complex correlation forms require a very large number (thousands!) of expensive dryout tests, and a cumbersome correlation development and verification process.

A third concern is that the different steady-state and transient dryout evaluation methods

are not really connected or co-joined. Existing steady-state methods are “best estimates,” while transient methods are “conservative.”

The point is: To a large extent, the overall transient analysis methodology relies on unphysical and overly conservative methods that prevent new fuel designs from realizing their full potential.

A New and Better Way

The problem of updating methods for assessing the risk of dryout has been partitioned into a number of smaller, more tightly scoped Customer 1st projects. The most important issues underlying the overall transient BWR methodology are being attacked first. An entirely new method for assessing steady-state and transient dryout was developed. This is being followed by projects on the overall transient methodology and more accurate representation of 3D flow effects. Finally, the team will address the critical skills and tools to ensure that improve-

ments are permanent and self-sustaining.

The steady-state dryout project developed an entirely new dryout correlation form. The number of regression coefficients is reduced by about 90 percent, while maintaining the same predictive accuracy versus the experimental database. This new method relies on a novel physical treatment of the most important effects governing the dryout phenomenon and, particularly, the axial power profile and flow dependence.

It has high extrapolating power outside of the experimental database and robustness ensured by the physical nature of the correlation form itself. The number of experiments required to develop correlations is reduced by at least one-third, and the cycle time to assess a correlation's performance was reduced by a factor of about 20.

A recently developed transient dryout method provides a physically correct behavior outside of

the experimental database by including mechanistically motivated features to explicitly treat transient phenomena. The new method is more accurate in simulating transient tests, and significantly decreases the operational penalty usually associated with the most limiting fast transients. The nature of this gain in accuracy agrees with qualitative expectations based on independent testing. The method can now be used in either the best-estimate or conservative mode. This has the advantage of being backward-compatible with the existing methodology, while also being suitable for the integrated statistical methodology under development.

Use of Customer 1st tools and cross-functional, multidisciplinary teams broke organizational silos and provided cross-fertilization of ideas to deliver truly innovative solutions.

As a Result

The new approach has the potential to redefine industry standards for dryout methods, further increase plant operating flexibility, and reduce fuel cycle costs. Westinghouse's SVEA-96 Optima3 fuel and POLCA-T code will be the first applications of the new methods and transient methodology. •

More: Dmitry Paramonov
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Preparing dryout test facility for new BWR fuel design.

Project Team

Carl Adamsson
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Sture Helmersson
Mahdi Majed
Gunilla Norback
Dobromir Panaayotov
Dmitry Paramonov
Bertil Scholin
Hakan Svensson

Customer 1st

AROUND THE WORLDVIEW

NONDESTRUCTIVE EXAMINATIONS OF ALL RWE PLANTS

RWE Power AG has extended its long-term agreement with Westinghouse to provide nondestructive testing and inspection services at its nuclear power plants Biblis A and B (PWRs), Emsland (PWR), and Gundremmingen B and C (BWRs) in Germany. Westinghouse has provided these services since 2001, and the extended agreement is until 2009.

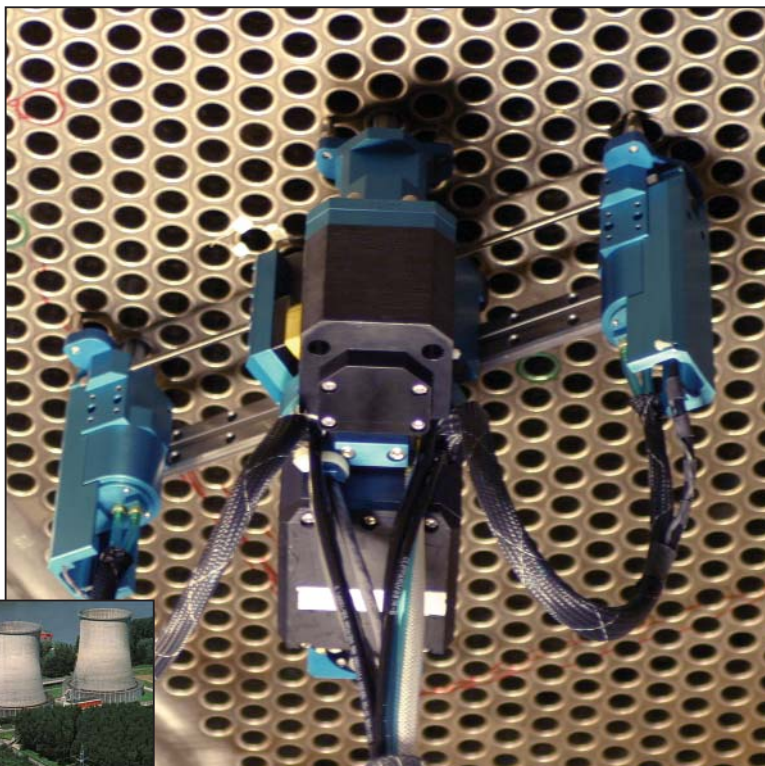
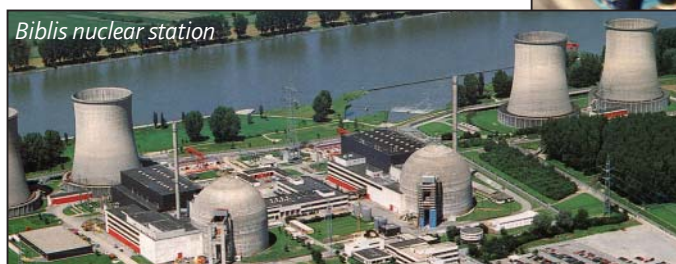
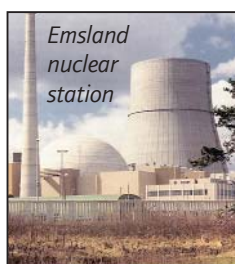
The agreement includes steam generator primary and secondary services; reactor

vessel in-service inspection; reactor vessel head penetration inspection; automated ultrasonic testing inspection; baffle to former and barrel bolt inspection; fuel alignment pin inspection; and various visual inspections, including special visual inspections of primary circuit valves. Under a cooperative arrangement, Cegelec will inspect the reactor pressure vessel heads and reactor pressure vessel in Gundremmingen.

RWE Power AG provides 34 percent of the electricity in Germany. With an installed capacity of 34,903 megawatts and 18,500 employees, it is the largest utility in the country and one of the largest in Europe.

More: Michael Zuefle
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The Pegasys™ manipulator, shown here at the Ladenburg service and qualification center, will be used for the inspection and repair of steam generator heater tubes.

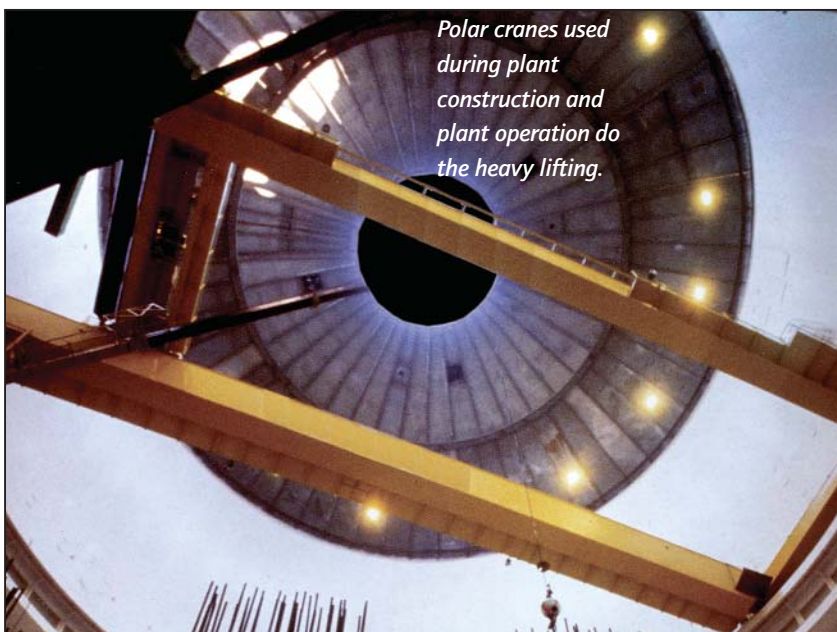


POLAR CRANES TO KOREA

Westinghouse will provide four polar cranes to Korea Hydro & Nuclear Power's (KHNP's) Shin-Kori Units 1 and 2 and Shin-Wolsong Units 1 and 2 in South Korea.

The cranes will be used for in-containment material handling during construction and plant operation, and are scheduled for delivery beginning in September 2007 and continuing through October 2009. This is the first order for full polar cranes supplied to KHNP by a non-Korean company since the early 1980s.

KHNP, a subsidiary of Korea Electric Power Corporation, operates 16 nuclear power units and is proceeding with the construction of four additional plants.



Polar cranes used during plant construction and plant operation do the heavy lifting.

The cranes will be supplied by Westinghouse subsidiary PaR Nuclear and its Ederer Nuclear Crane division. PaR Nuclear is the original equipment manufacturer of fuel-handling equipment for 57 nuclear power plants in seven countries,

including 35 in the U.S. PaR Nuclear has also provided more than 85 automated refueling equipment control system upgrades.

More: John Qualizza
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SPREADING A SAFETY CULTURE

A major manufacturing facility in Kazakhstan is undergoing dramatic changes in its safety culture using many of the ideas originated at the Springfields Fuels site in the United Kingdom.

Derek McMillan, a behavioral safety coordinator at the Westinghouse-operated site at Springfields; Jörgen Gustafsson, from the Westinghouse site at Västerås; and Stig Rolandson, from the Swedish Nuclear Power Inspectorate; visited the Ulba Metallurgy plant in northwest Kazakhstan to share their safety-related best practices.

The Ulba plant processes uranium and manufactures nuclear fuel for Soviet-designed reactors, as well as intermediate fuel products for Western fuel fabrication facilities. It is one of the largest plants of its type in the world.

The team's visit, coordinated by the International Atomic Energy Agency, was to assess the safety culture at the plant. Derek and his colleagues explained the safety culture in Westinghouse, including behavioral safety initiatives, risk assessments, near-miss reporting, barriers to safe working and the Springfields Safety Charter.

The next phase of the project will be for a small delegation from Ulba to participate in a week-long training program at Västerås in October. This group will return to Kazakhstan and begin the important task of introducing the various safety initiatives and encouraging a behavioral safety culture at the plant.

More: Alan Beauchamp
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IMPACT OF THE 2005 OUTAGE SEASON

Service companies are not the typical firm to undertake initiatives like Customer 1st. Many of the tools (Six Sigma, Lean, Human Performance, Behavioral Differentiation) do not readily lend themselves to a global organization housed in service facilities worldwide, with the largest percentage of its employees providing support at the customers' plants for a significant part of the year.

However, the 2005 U.S. spring outage season provided an opportunity to apply Customer 1st tools and behaviors. And customers are seeing a difference; here are a few of the comments we've received, with other quotes included within stories in this issue of *World View*.

Overall, the comments following the spring outage season were overwhelmingly positive. The feedback from these personal observations as well as written performance report cards reveals an organization that is doing well, making a difference ... and improving.

More: Tom Dent
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"One of the best projects I have ever been associated with. The integration of the work with the 10-year in-service inspection was extremely important to the success of the outage. The work ethic of the split pin personnel is outstanding, and their knowledge of this work is exceptional."

Surry (Dominion)
Split pin replacement

"Observed a good improvement in workers' performance and equipment reliability from last year's decon job. Good human performance training provided by Westinghouse."

Quad Cities (Exelon)
Chemical decontamination

"The refuel project manager demonstrated a unique talent of understanding individuals and how to adapt to individual peculiarities, which is needed to make the refueling group hold together. We were able to have a successful refueling because personnel worked smart and know how to work in attempting to avoid unnecessary errors."

Beaver Valley (FENOC)
Refueling

"The QA/QC function has provided great value to overall success of this outage. Knowledge of personnel and aggressive, proactive approach to implementing QA program also promotes excellence and continuous improvements in the product line."

Comanche Peak (TXU)
QA and QC

"The site relationship with the Westinghouse team is predicated on such trust that communication extends beyond the mere facts of an issue to a higher level of understanding and awareness of all sides and nuances of an issue."

Comanche Peak (TXU)
Steam generator primary services

"The Customer 1st process has helped get the team ready to perform this task. I am confident that we will complete the scope safely and on schedule. I am looking forward to the results of the Customer 1st process on the remaining work scope for the HAUP assembly and the containment scope."

Millstone (Dominion)
CEDM Canopy Seal Weld



Split pin installation.

ULCHIN 6 ENTERS COMMERCIAL OPERATION

The Ulchin Unit 6 nuclear power plant, owned and operated by Korea Hydro & Nuclear Power Company (KHNP) and located on the eastern coast of the Republic of Korea, entered commercial operation on April 22, 2005. The plant supplies 1000 megawatts to the nation's electrical grid.

Ulchin Unit 6 is designated as an Optimized Power Reactor (OPR1000) and is based on Westinghouse System 80® technology. It is the eighth nuclear power plant of this design to enter into commercial operation in South Korea within the last ten years. This is a reflection of the successful long-term technology transfer and cooperation between the South Korean nuclear industry and Westinghouse.

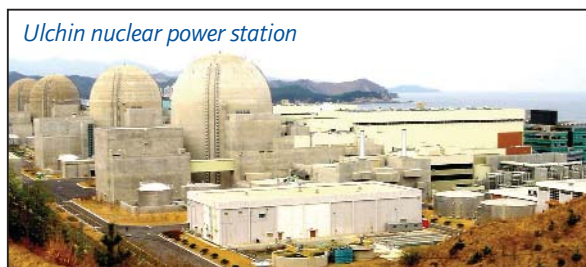
In addition to such major components as reactor coolant pumps and reactor internals supplied by Westinghouse, Ulchin Units 5 and 6 are the first Korean units to use Westinghouse's new advanced instrumentation and control system that includes a digital plant protection system and a digital engineered safeguards features actuation system.

"The continued success of the Korean nuclear power program is an example to the rest of the world," said Jack Allen, senior vice president at Westinghouse. "Nuclear power plants are being built on time and within budget, and helping South Korea address issues such as global warming and security of fuel supplies."

KHNP also plans to begin construction of the first Advanced Pressurizer Reactor (APR1400) in the near future. These 1400 megawatt units represent the next generation of nuclear power plants to be built in the Republic of Korea.

KHNP is a subsidiary of the Korea Electric Power Corporation. It operates 20 nuclear power units, 14 of which include Westinghouse-supplied components. KHNP consistently achieves some of the highest capacity factors in the world for its nuclear fleet, which has averaged over 90 percent availability for the last five consecutive years.

More: Edward Bracken
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REALISTIC LOSS-OF-COOLANT ACCIDENT ANALYSES

The U.S. Nuclear Regulatory Commission has issued a Safety Evaluation Report for the Automated Statistical Treatment Uncertainty Methodology (ASTRUM). This now extends the Westinghouse best-estimate loss-of-coolant accident (LOCA) methodology to include the majority of pressurized water reactors throughout the world, including those designed by Westinghouse and its licensees as well as those designed by Combustion Engineering.

ASTRUM generates considerable LOCA margin when compared to previous analytical methods. The potential benefits to plant operators include extended power uprates, significantly enhanced fuel economics and increased operational flexibility.

More: Mike Corletti
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DECISIONS! DECISIONS!

When critical engineering and operational issues need to be resolved, you have to decide what to do and when to do it based on a realistic assessment of the costs and risks involved.

The Westinghouse Decision Advisor Process™ provides quantitative data, such as the net present value of costs and benefits, and identifies and evaluates the best course of action. The Decision Advisor Process supports decisions regarding engineering and operational issues in a manner that incorporates strategic and financial implications.

The analysis may also highlight contingency plans to minimize operational risks. It may be that less resource-intensive options have nearly the same relative cash flow and financial exposure or risk.

For example, the analysis can be applied to questions concerning reactor vessel head inspection, repair, replacement and installation. It applies a crack-initiation and propagation model to predict the distribution of cracks throughout the balance of plant life. It addresses mitigation and replacement decisions on a plant-wide basis, considering the timing of related issues, such as steam generator replacement.

A subset of the analysis tool is called the Decision Dialogue Process™. It provides a structured way to make and implement decisions for technical issues that have strategic implications. This Process organizes actionable alternatives, and when used primarily for major decisions, links plant issues, options and risks. It clearly shows the

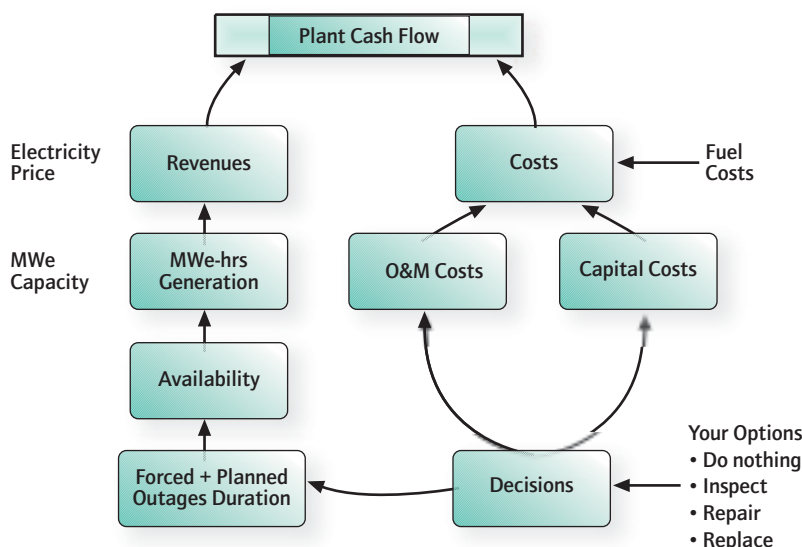
impact of technical issues on key financial measures.

The Decision Advisor Process incorporates Westinghouse's fleet-wide experience base and technical expertise. The analysis has recently been used in several technical areas to support plant decisions, this includes:

- Reactor vessel head replacement options concerning Alloy 600 issues;
- Pressurizer replacement options;
- Applications for baffle barrel bolts, split pins and reactor coolant pumps;
- Long-term control rod drive mechanism replacement purchasing strategies; and
- Timing and extent of risk-informed piping inspection alternatives.

More: Ted Meyer
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An Influence Diagram shows the big picture by relating technical alternatives to key utility financial measures.



OPTIMIZING THE INSTALLATION OF THE HEAD ASSEMBLY UPGRADE PACKAGE

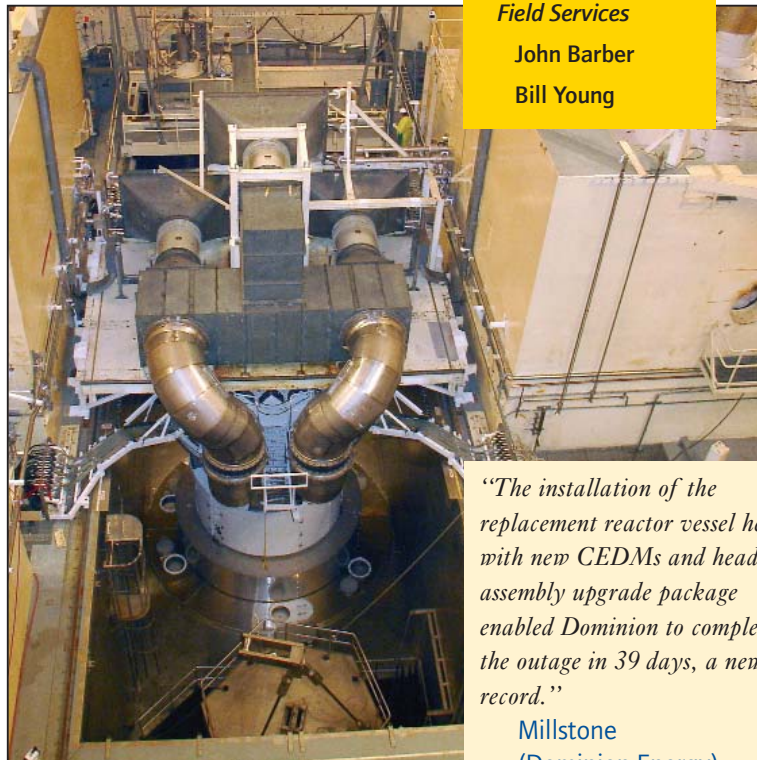
Many utilities are electing to replace reactor vessel heads as an alternative to repairing pressure vessel head penetration cracks caused by primary water stress corrosion. The Westinghouse head assembly upgrade package (HAUP) makes it easier to install the replacement vessel head and also facilitates the head's removal during subsequent outages.

However, the assembly and installation of the upgrade package is performed during a refueling outage and involves a significant amount of labor-intensive work both inside and outside of the containment. As outages continue to get shorter, these activities have an increasingly important impact on the critical path of outage schedules.



Head assembly upgrade package is assembled on the replacement reactor vessel closure head stand in containment.

A Customer 1st team examined ways to optimize the activities associated with the assembly and installation of the upgrade package to require less work and shorten the schedule. Using tools such as process mapping, cause and effect matrix, value stream mapping, detailed process mapping, and failure modes and effect analysis, the team identified the critical inputs/process steps in the installation process. Five of them were chosen for improvement: procedures/drawings, rigging hardware, polar crane usage, rigging plan and personnel training.



Replacement reactor vessel closure head with head assembly upgrade package is installed in the reactor vessel cavity.

The changes that resulted from this work were implemented during the spring replacement reactor vessel head outage at Dominion Energy's Millstone Unit 2 in Connecticut. The results were outstanding: The outage critical path time was reduced by 28 hours and total radiation exposure by 2.5 man-rem.

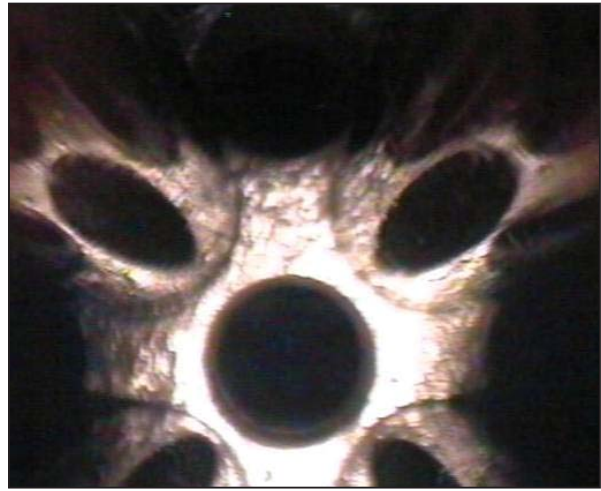
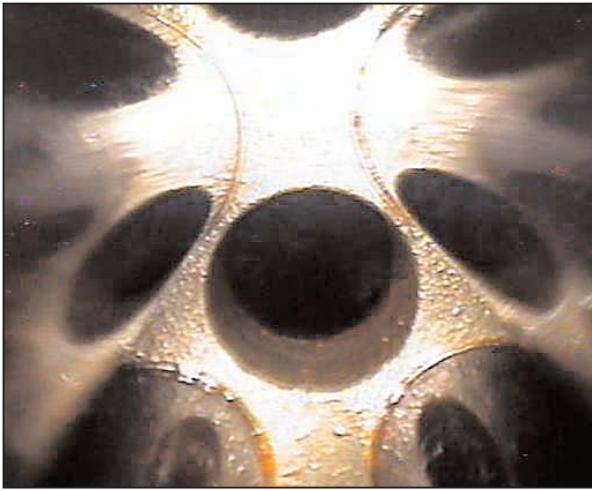
More: Boris Nadgor
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Project Team:
Engineering Services
Tod Baker
Clark Candee
Boris Nadgor
Field Services
John Barber
Bill Young

"The installation of the replacement reactor vessel head with new CEDMs and head assembly upgrade package enabled Dominion to complete the outage in 39 days, a new record."

Millstone
(Dominion Energy)
Reactor vessel head replacement

CHEMICAL CLEANING AT DIABLO CANYON



Photographs taken by R. Brooks Associates during post-cleaning visual inspections confirm the removal of deposits from the free span of tubes and the tube support plates. Left: Top of the 2nd tube support plate of steam generator four of Unit 2. Right: Top of 6th tube support plate of steam generator one of Unit 1.

Chemical cleaning of the steam generators at Pacific Gas and Electric's Diablo Canyon nuclear power plant was performed by a team of Westinghouse/PG&E personnel during the Spring 2004 outage (Unit 1) and during the Fall 2004 outage (Unit 2). Nearly 23 tons of corrosive debris was removed from the eight Unit 1 and 2 steam generators.

Diablo Canyon has two PWR units, each with four Westinghouse steam generators. Each steam generator includes 3,388 Alloy 600 tubes with 51,500 square feet of total heat transfer area. The purpose of the steam generator chemical cleanings was to mitigate or prevent secondary side tube corrosion and prevent fouling of the generators that could compromise PG&E's ability to achieve 100 percent of rated plant output.

An external heat process was used to chemically clean the tubes. This included process steps for copper and iron oxide removal, and top-of-the-tubesheet cleaning steps. A combined total of

approximately 46,000 pounds of deposits were removed from the eight steam generators. One measure of the cleanings' success was that post-cleaning eddy-current readings were almost as good as the pre-service readings when the steam generators were new.

In-situ monitoring verified low corrosion rates to steam generator structural materials during the application of the process.

Pacific Gas and Electric Company is a wholly owned subsidiary of PG&E Corporation and is one of the largest natural gas and electric utilities in the United States. It provides service to approximately 12 million people in Northern and Central California.

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Ron Morris
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PROACTIVE REMOVAL OF SECONDARY SIDE DEPOSITS

Under normal pressurized water reactor operation, the feedwater transports impurities to the secondary side of the steam generators. These impurities accumulate and deposit on secondary side surfaces, reducing heat transfer efficiency, disrupting thermal hydraulic flow patterns, and accelerating the degradation of the steam generator internal components. Currently, remedial actions are taken only after deposit-related problems occur.

A more proactive approach is to periodically apply advanced scale conditioning agents, or ASCAs, to remove those deposits that accumulate over a few cycles. ASCAs are dilute chemical solutions that have negligible effect on steam generator materials. The periodic application of ASCAs prevents deposits from accumulating and adversely affecting generator performance.

ASCAs are primarily intended for application in plants with

light to moderate deposit loading, typically less than 2000 pounds per steam generator. For plants with heavier loadings, more robust deposit removal techniques such as steam generator chemical cleaning are required.

Special ASCAs have also been formulated to remove specific aggressive impurities such as copper, as well as hard-to-remove aluminum and silica-rich deposits at the top of the tube sheet. Combining ASCAs with mechanical cleaning techniques such as ultrasonic energy cleaning and pressure pulse cleaning can increase deposit removal efficiency by a factor of two or more compared to applying either technology alone.

ASCA technology was developed by Dominion Engineering, Inc. in conjunction with Westinghouse.

More: Rick Reid
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GOOD NEWS

First, the world's nuclear generation rose nearly four percent in 2004 to 2,696 billion kilowatt hours, due in large measure to increased capacity and good performance especially in Sweden and the United States.

Second, The International Atomic Energy Agency has significantly raised its projection of global nuclear capacity and is now predicting 427 gigawatts (GW) of capacity in 2020, a rise of 127 megawatts over their 2000 prediction.

Reasons for the expected increase in capacity include plans by China to raise its installed nuclear electricity generating capacity from the current total; India's proposal of a 10-fold increase in its capacity by 2022; Russia's plans to raise its capacity from 22 GW to 40-45 GW by 2020 as well as France and Finland's "more moderate plans" to expand their capacity in coming years.

AP1000 DVD AVAILABLE

"New Generation of Nuclear Power" is a new DVD that details the safety, operational and economic characteristics of the Westinghouse AP1000 advanced nuclear reactor.

The AP1000 is the only Generation III+ nuclear power plant that has received Final Design approval from the U.S.



Nuclear Regulatory Commission. It is an advanced 1200 MWe nuclear power plant that uses the forces of nature and simplicity of design to enhance plant safety and operations, and reduce construction costs.

More: News Room at
www.westinghousenuclear.com
For a copy of the DVD: Linda Kendro
kendr11m@westinghouse.com

FLANGEBOT ROBOT CLEANS REACTOR HEAD SEALING SURFACE

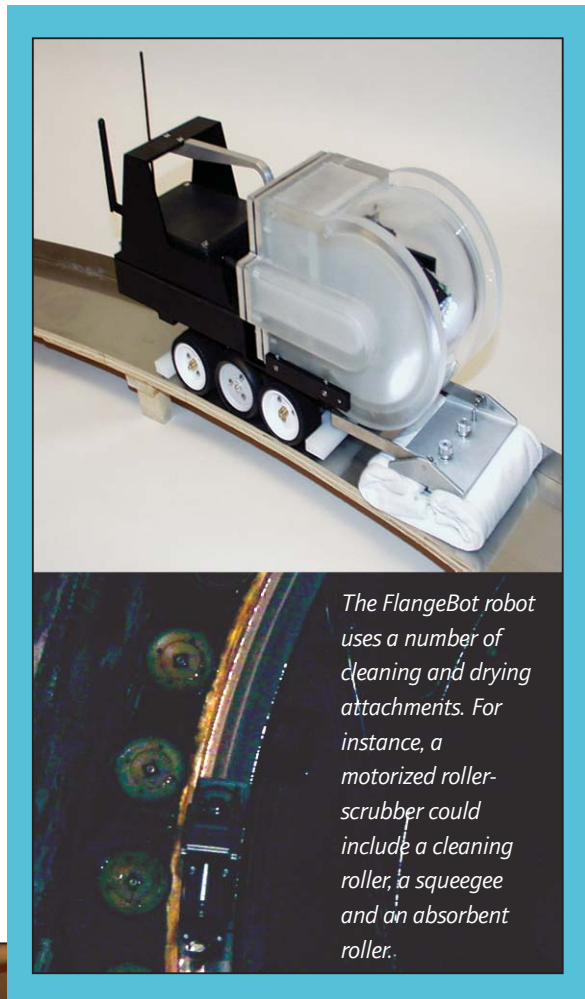
A critical aspect of a refueling outage is properly reseating and fastening the reactor vessel head. This involves cleaning, lubricating and tensioning the reactor studs and thoroughly cleaning the seating surfaces.

The FlangeBot™ robot cleans and dries the reactor vessel flange O-ring sealing surface and provides a detailed video record of the inspection. The FlangeBot system consists of a remotely controlled wheeled vehicle that carries a color TV camera and various cleaning attachments; relay station with antennae; and a remote control console.

The vehicle can be easily deployed and retrieved, either by hand or by lowering it onto the flange from the refueling bridge. The FlangeBot dramatically reduces both potential industry safety hazards and dose; since personnel don't have to work in high radiation fields or under suspended loads.

The FlangeBot is a joint development of ROS Incorporated and Texas Utilities.

More: Mitch Burke
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ENHANCING REACTOR COOLANT PUMP MOTOR PERFORMANCE

Large reactor coolant pump motors can be remanufactured to enhance their availability and reliability. Factory remanufacturing consists of a complete disassembly; extensive cleaning; detailed inspection; and returning components to original tolerances. This is followed by no-load testing of the motor and verification of instrumentation operation.

Westinghouse will provide reactor coolant pump motor remanufacture services for Southern Nuclear Company's Vogtle plant in Alabama and Farley plant in Georgia; Exelon's Byron and Braidwood plants in Illinois; and FPL Energy's Seabrook plant in New Hampshire and Turkey Point plant in Florida.

Westinghouse provides new motors, pumps and other critical parts as well as performing pump and motor field, shop, and engineering services.

More: Mark Ellis
ellismr@westinghouse.com



"I have been the nuclear steam supply system work manager for five or so outages, and this was one of the best ever from my dealings with Westinghouse."

Comanche Peak (TXU)
RCP services

U.K. DECIDING ON NUCLEAR WASTE OPTIONS

The United Kingdom's Committee on Radioactive Waste Management has proposed cutting the original list of fifteen options for managing radioactive waste down to just four: near-surface disposal (for short-lived wastes); long-term interim storage; deep-geological disposal; and phased deep-geological disposal. Options the Committee are abandoning include disposal in space, disposal in ice sheets and disposal at sea.

The final shortlist will be produced in the summer of 2005 after the Committee's second phase of public and stakeholder consultation. The final option or combination of options will be recommended to Ministers in July 2006.

More: www.corwm.org.

MOISTURE SEPARATOR REHEATER REPLACEMENT

PCI Energy Services, a Westinghouse subsidiary, completed the turnkey Moisture Separator Reheater (MSR) Rebundling project for PSEG Nuclear's Salem Unit 2 power station in New Jersey. This included the removal of existing tube bundles, internal vessel modification, and the replacement of two MSR tube bundles. It also included the replacement of a blowdown steam coil drain tank pump and additional piping modifications to support the Unit's uprate.

More: Bruce Hinton
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GREAT ALTERNATIVE ENERGY SOURCE

Here's a thought. The world is facing an energy crisis. Well, we can extract energy from black holes. Drop a particle into a rotating black hole's ergosphere (a spacelike region just outside the event horizon). Then arrange to have it (the particle, not the black hole!) explode in two. A particle of negative energy will fall into the hole and a particle of positive energy will escape. This positive particle will have an energy greater than the original particle. It's called the law of conservation of energy.

By making the black hole swallow negative energy we force it to give us some of its rotational energy. We can keep this process up until it stops spinning, and we get 29 percent of the original mass energy (mc^2) of the black hole! Just a thought.

SHAW STONE & WEBSTER JOINS AP1000 CONSORTIUM

Shaw Stone & Webster has joined with Westinghouse and Mitsubishi Heavy Industries as the Architect Engineer for the AP1000 Consortium to supply advanced power plants to the Republic of China.

Shaw has broad experience in nuclear power, and its existing operations in China signify a commitment to the Chinese objectives for the Sanmen and Yangjiang projects and their national goals to achieve self-reliance.

The AP1000 Consortium is working with the State Nuclear Power Technology Company (SNPTC) and others within China toward a set of final contracts for the AP1000 as the third-generation nuclear power plant in China.

Shaw's work will include engineering, procurement, and construction management. Shaw is currently performing construction and construction management services for the restart of the Browns Ferry Unit 1 nuclear power plant in Alabama. The company has been involved in the design and construction of 17 nuclear power stations, and provided maintenance and modification services to 35 nuclear units.

The AP1000 Consortium is seeking to win contracts for the nuclear island portion of four nuclear power plants as well as technology transfer and peripheral equipment and services. A decision is expected by SNPTC later this year.

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MILLIONS OF DOLLARS CAN BE SAVED ON O&M COSTS

A new U.S. Nuclear Regulatory Commission (NRC) regulation is expected to enhance safety and save millions of dollars in operating and maintenance costs.

The NRC recently published a new regulation (10CFR Part 50.69) that reduces special treatment requirements (meaning, nuclear requirements) for safety-related components that have low safety significance. The rule maintains existing regulatory requirements for equipment of higher safety significance.

The new regulation may save utilities as much as \$1 million per unit annually in operations and maintenance costs normally associated with the special treatment requirements. Utilities would save the most by procuring parts and services under commercial grade procurement processes rather than safety-related processes.

Assessing Safety Significance

To implement the provisions of the new rule, a detailed assessment is required of the safety significance of all of the components in selected plant systems. The NRC is endorsing two categorization processes; one developed under the Nuclear Energy Institute for active components and the other for pressure retaining components developed by ASME.

Westinghouse used these methods to perform the component categorization for the only pilot plant applications, at Surry in Virginia and Wolf Creek in Kansas.

The new rule is voluntary and applies to all systems in the plant. However, most primary systems directly tied into the reactor coolant piping, such as the safety injection, auxiliary

feedwater and residual heat removal systems, will likely be ranked as safety-significant, and the special treatment requirements will remain unchanged. The utility may choose which systems to apply the rule. By screening components based on their safety significance, the plant can focus attention on the truly safety-significant equipment.

Low safety-significant components no longer subject to special treatment requirements might include major components such as pumps, valves and motors as well as the piece-parts that support these components.

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WALTZ MILL SITE EXPANSION

In April 2005, Westinghouse broke ground on a new building at the Waltz Mill site in Madison, Pennsylvania. The expansion will provide an additional 26,000 square feet of office and shop space to accommodate engineering and nuclear plant inspection services.

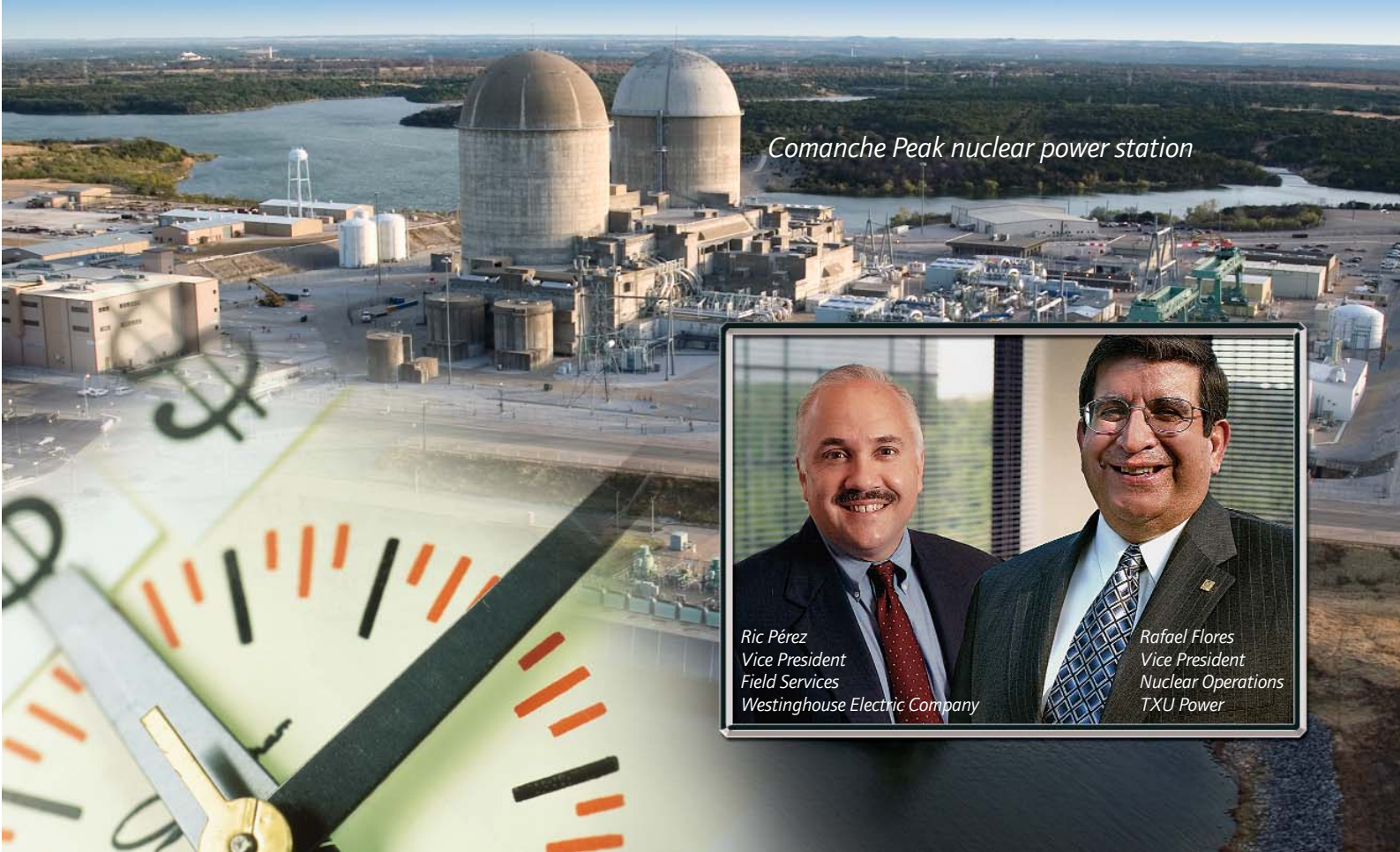
"This project is a sign of the very positive business climate for the nuclear industry," said Ric Pérez, vice president, Field Services. The project will be completed by the end of 2005.

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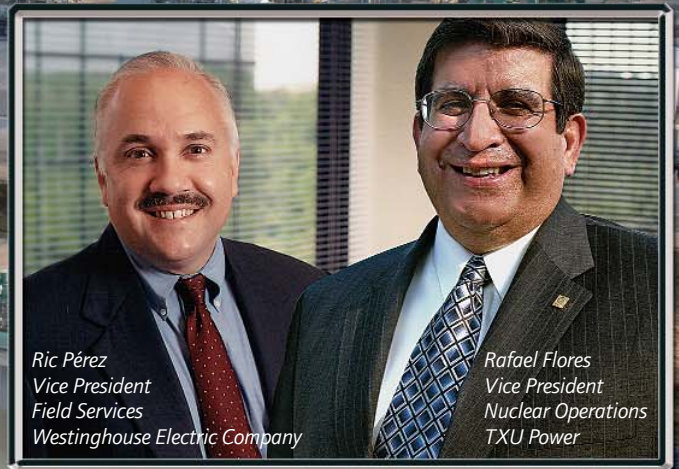
RECORD-SETTING REACTOR VESSEL HEAD INSPECTIONS

WesDyne International, a Westinghouse subsidiary, set new performance records at Exelon's Byron Generating Station in Illinois during the March 2005 refueling outage. WesDyne completed Byron's Unit 1 reactor vessel volumetric head penetration inspection and reactor vessel in-service inspection in record time, with no safety issues, no quality issues and well below the projected dose.

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Comanche Peak nuclear power station



Committed to customer success.

"The Comanche Peak team displays pride in their work every day, but our pursuit of excellence does not allow us to be satisfied. The Westinghouse team has helped us to strive for excellence in outage execution."--Rafael Flores

A strategic goal of the alliance between Westinghouse and TXU Power's Comanche Peak staff is to reduce the plant's outage durations to improve production costs.

In fact, Westinghouse committed one of our Customer 1st experts, Ric Pérez, to address this goal.

Working with Rafael Flores and the Teaming Executive Board, Ric led a team of Comanche Peak and Westinghouse employees in applying Six Sigma and Lean tools to determine where and how the outage startup could be reduced by 2 to 3 days.

As a result, efficiencies during the startup have been targeted to move the plant from Mode 4 to 100% MWe within an optimized schedule, keeping Comanche Peak as one of the top performing plants in the United States.



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