TIP AWARDS

"Best of the best" industry prize goes to Entergy Nuclear

The TIP awards recognize industry employees in 13 categories for innovations that improve safety, efficiency, and nuclear plant performance.

EMPLOYEES OF ENTERGY Nuclear earned the Nuclear Energy Institute's Top Industry Practice (TIP) "Best of the Best" award for efficiency gains throughout the company's nuclear fleet. NEI said that the employees won for their tiered, team approach to making improvements at the company's plants, using a work culture that empowers employees to achieve excellence in daily affairs.

Entergy Nuclear's work teams are formed based on the complexity of the job to be tackled. Natural Work Teams address simple problems; Charter Teams handle problems that significantly affect a single plant site or the entire fleet; and Sigma Teams work to improve more complex processes where there are deviations from acceptable process controls. To challenge Entergy Nuclear's individual plant sites to make improvements, the company developed a points structure that establishes clear expectations for efficiency improvements.

Among other accomplishments, Entergy Nuclear's continuous improvement program eliminated 290 000 person-hours in 2006, enabling employees to devote that time to higher-priority work activities. The program also allowed the workers to avoid a significant amount of radiological exposure. The various improvements completed by using the program saved more than $8.7 million in site budgets, with an additional $21 million realized from more reliable electricity production.

Another example of the program's effectiveness is a new Web-based Emergency Operations Center (EOC). The old process used telephones and faxes to pass along information, leaving the organization vulnerable to miscommunication. With the Web EOC, all locations get the same information at the same time from a single communication point.

"Senior management does not direct such improvements. Instead, employees who actually do the work guide this program from inspiration to implementation," said Marvin Fertel, NEI's senior vice president and chief nuclear officer.

The "Best of the Best" TIP award was presented to Entergy Nuclear on May 24 during NEI's 2007 annual conference, held in Miami, Fla. The TIP awards recognize industry employees in 13 categories—four vendor awards and nine process awards—for innovations to improve safety, efficiency, and nuclear plant performance. The Best of the Best Award honors the late B. Ralph Sylvia, an industry leader who was instrumental in starting the TIP awards in 1993.

Source: NEI

This year NEI received 113 entries for awards, the second-highest number in the program's history. Other companies with employees who received awards are AmerenUE, American Electric Power, Constellation Energy, Dominion Nuclear Connecticut, Exelon Nuclear, FirstEnergy, FPL Energy, and the Tennessee Valley Authority (TVA).

"These individuals personify our industry's ongoing commitment to improving safety, efficiency, and performance. Their innovations will lead the way toward excellence in the development and operation of tomorrow's reactors," Fertel said.

Vendor awards

TIP awards were presented for top practices and improvements to plants that are associated with these nuclear design-engineers: Areva, Westinghouse Design, Westinghouse-Combustion Engineering (CE) Design, and GE Energy Nuclear.

Dominion Nuclear Connecticut received the Areva Vendor Award for its replacement of the pressurizer at the Millstone nuclear plant with material and design features that will reduce inspections while maintaining high safety levels. The Millstone team challenged conventional wisdom by selecting stainless steel for manufacture of the new pressurizer instead of Alloy 690, a widely used composite. The replacement pressurizer will save Dominion an estimated $20 million ($1 million per refueling outage) and reduce outages by two days per outage. In addition, the new pressurizer will reduce radiation exposure and improve the reliability of the new equipment.

The Westinghouse Design Vendor Award was presented to FirstEnergy Nuclear Operating Company for the successful completion of its multiyear Full Potential program at the two-unit Beaver Valley nuclear plant in western Pennsylvania. The program included the replacement of the steam generators and other major plant modifications to facilitate a power uprate, conversion of the containment structure to increase safety margins, and replacement of a reactor vessel head. The steam generator replacement alone will save FirstEnergy an estimated $3.5 million per refueling outage in inspection costs, while about $50 million was saved by concurrently replacing the steam generators and the vessel head using a single construction opening in the containment.

Entergy was recognized with the Westinghouse-CE Design Vendor Award for the widespread use of a wireless network at the two-unit Arkansas Nuclear One plant. The site-wide network has enhanced performance in plant operations, radiation protection, maintenance, engineering, and security.

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For example, the plant now uses wireless cameras to monitor the loading of spent-fuel assemblies into storage containers. Fire watches also use wireless cameras during outages to monitor work from areas where exposure to radiation is minimized. In addition, security guards use wireless equipment to facilitate identification of personnel entering checkpoints.

Employees of Constellation Energy received the GE Energy Nuclear Vendor Award for innovations at the two-unit Nine Mile Point power plant in upstate New York. The employees implemented GE's On-line NobleChem (OLNC) technology to apply noble metal to reactor vessel internals while the plant is operating. The plant had previously applied the traditional NobleChem method while the plant was not generating electricity, but the plant team wanted the most effective application of noble metal without increasing radiation exposure to workers during a refueling outage. The team also wanted to better protect vessel internals and piping. The application of OLNC was the first at a U.S. nuclear power plant and saved the plant nearly $1.5 million. The on-line application did not affect normal maintenance and testing activities.

An illustration of Entergy Nuclear's Jet Pump Inspection Tool inside a reactor cavity (Graphic: Entergy Nuclear)

Process awards

This year, nine TIP process awards were presented to recognize employees at the following companies:

■ FPL Energy, Operate Plant Process Award, for environmental stewardship at the Duane Arnold nuclear plant in eastern Iowa. Working with the University of Iowa, workers built a scale model of the Cedar River to solve sedimentation and maintenance challenges at the plant's water intake structure stemming from the widening of the river's main channel. The use of the model permitted analyses of alternative solutions without affecting the environment downstream from the plant. It ultimately led to the identification of a solution—including sediment control modifications and straightening of the riverbank upstream from the intake structure—that has been applauded by conservation experts and will save an estimated $300 000 annually in maintenance expenses.

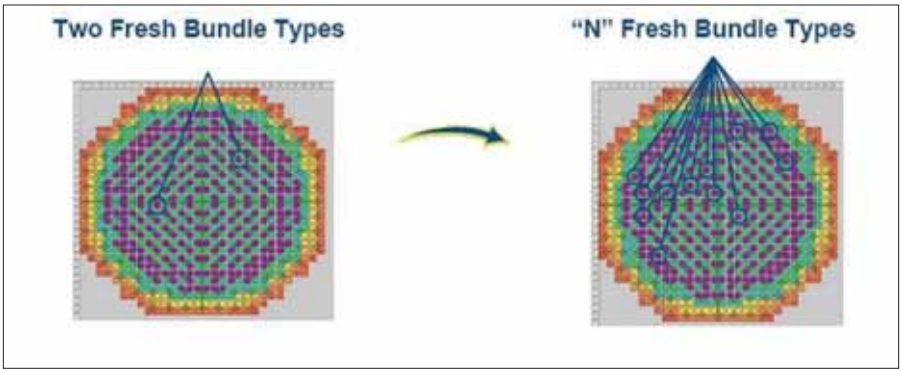
■ Exelon Nuclear, Configuration Management Process Award, for making the two-unit Limerick plant, in Pennsylvania, the first nuclear plant to receive Nuclear Regulatory Commission approval to control the frequency of surveillance testing of plant components and systems. Exelon was recognized for implementing a safety-focused methodology (developed jointly with NEI and the Boiling Water Reactor Owners Group) that allows it to conduct inspections based on the safety significance of a component or system rather than by a predetermined schedule that was established before historic operational data were available to guide development of the testing requirement.

A surveillance test determines whether a component or system is operable. Changes to testing schedules no longer require prior NRC approval because all changes will be based on the NRC-approved methodology.

■ AmerenUE, Work Management Process Award, for the remediation of its underground "fire water loop" at the Callaway plant in Missouri. Water flow through the system had decreased over time, so the Callaway team added chemicals to the system to dissolve corrosion products that were reducing the water flow. The system was restored to desired levels of performance without the need for more costly, disruptive replacement of underground piping.

■ Entergy Nuclear, Equipment Reliability Process Award, for designing with General Electric a submersible, remote-operated vehicle called the Jet Pump Inspection Tool. The vehicle was used for a 10-year service inspection of the reactor pressure vessel at the FitzPatrick nuclear plant in

The University of Iowa's hydraulics laboratory model of the Cedar River and the Duane Arnold plant's intake structure (Photo: FPL Energy)



An illustration of the Peach Bottom plant's transition from current reload strategy to N-Streaming (Graphic: Exelon Generation)

New York. The innovation saved approximately $1.5 million in inspection costs and will be used at other Entergy Nuclear boiling water reactors.

The ability of the self-propelled submersible vehicle to maneuver through the water in the reactor cavity enabled the FitzPatrick team to overcome access limitations that had complicated the inspection. The vehicle delivers the equipment used to perform the inspection to the areas being examined, hovers in the storage pit, and retrieves the equipment once the examination is complete. The system required fewer resources, reduced worker radiation exposure, and increased the time between inspections.

■ Exelon Nuclear, Materials and Services Process Award, for improving the reliability of an analog electro-hydraulic control system. The innovation permits a more comprehensive testing of system circuit cards before they are installed, reducing the potential for power plants to shut down unexpectedly. It also holds the potential to reduce by two-thirds—from about three days to one day—the time required for a plant to return to operation after electricity production is interrupted. This can mean a cost savings of hundreds of thousands of dollars annually, which is passed on to consumers.

■ Entergy Nuclear, Management Processes and Support Services, for the continuous improvement process recognized with the Best of the Best Award.

■ Exelon Nuclear, Loss Prevention Process Award, for installing new steam dryers during a refueling outage and then disassembling and disposing of the old ones while the two reactors at the Quad Cities plant in Illinois were operating at full power. The Quad Cities team segmented and shielded components during this major project through the development of a modular tank to fit inside and secure the dryer/separator pool. This allowed the steam dryer to remain submerged while work crews segmented it—an approach not envisioned in the original plant design.

The project allowed for the continued safe operation of both reactors—with enhanced worker protection—during the extensive changeover, saved 57 days of plant downtime, and saved $42 million in replacement power and outage maintenance. The equipment and the process for doing this steam dryer disassembly can be used at any reactor with a similar footprint.

■ Exelon Nuclear, Nuclear Fuel Process Award, for the application of a fuel assembly "bundling" concept called N-Streaming at the two-unit Peach Bottom plant, in Pennsylvania. Working with Global Nuclear Fuel, the Peach Bottom team developed six different bundle designs for a refueling outage to improve fuel cycle efficiency. The resulting decrease in the number of bundles needed for the refueling equates to a reduction in fuel costs of approximately $2 million over two years. The strategy employed at Peach Bottom is transferable to other nuclear power plants.

■ American Electric Power, Training Process Award, for developing a process that automated simulator training. The team at the two-unit Donald C. Cook nuclear plant in Michigan changed the paradigm from a simulator setup that was done manually to one that is computerized. The new process electronically captures comments by both the evaluation team and the students. In addition, the training department and shift manager can categorize the comments to allow for detailed analysis.

An example of where the team used this process was in radiation worker performance training. The team developed performance-based radiation worker training using software programs that are transferable because they run on software platforms common to most plant sites. As a result, the radiation worker error rate per 10 000 workhours decreased 62 percent over the past three outages.

■ A special recognition award was presented to TVA for the vision and leadership demonstrated in its nuclear fuel assembly inspection program. The program has contributed to improvements in fuel reliability at TVA's reactors, enhancing safety and potentially saving millions of dollars that would need to be spent on unscheduled outages to address fuel problems. NN