

Building and maintaining the **TRANSMISSION SYSTEM**

Concrete can grow?

Page 2

'Miracle man'

Page 4

New life for Bellefonte

Page 4

What has been called 'the world's largest machine?'

Hint: TVA operates part of this machine.

It's the enormous power network that delivers electricity to every home, business and school in the country. The power-system grid continuously balances supply and demand. It also ties individual power systems together — if one fails, others provide support.

The transmission system takes power from generating plants and carries it across the transmission wires at 500 or 161 kilovolts. The power is delivered to about 923 customer delivery points, where the voltage is reduced from 161 kilovolts to distribution levels. The distributors of TVA power carry it the remaining distance to homes and businesses. In

addition, TVA transmits power directly to 59 industries with large or unique power-supply requirements.

The transmission system also connects TVA with neighboring utilities.

See "Transmission system" on page 2

DAM SAFETY AT TVA Preventing damage to dams

Extreme floods, earthquakes and deterioration are major hazards to dams.

TVA's dam safety-inspection group identifies potential problems and corrects them before a major incident occurs.

Diving underwater at massive concrete structures and rappelling down a 480-foot high dam are all part of the work for TVA's dam safety-inspection group.

"Our inspectors are specially trained in safety practices before they do any work," says Scott Kramer, principal lead engineer in Civil Engineering in River Operations Support Services.

Inspectors look for significant cracking of the concrete blocks that make up the dam structure.

"Divers do the same inspections below the water level," Kramer says. "They look at the trash racks, spillway aprons and intake-gate guides."

Kramer and Ron Branam, principal engineer in RO Support Services, schedule dam inspections and perform them with their crews. TVA

follows Federal Guidelines for Dam Safety recommendations, which include engineering assessments, periodic inspections, maintenance and repairs, and emergency-action planning.

"Maintenance and repair are essential to keep the dams in top working order," Kramer

See "Dam safety" on page 2

Inside TVA

RETIREES EDITION

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Comments and suggestions are welcome. Send them to Inside TVA Retirees Edition, WT 7A-K (400 W. Summit Hill Dr., Knoxville, TN 37902), or call 865-632-8004.

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Retirees who do not get pension checks from TVA but have TVA medical insurance need to update their address with the same information as above if they move and mail it to the TVA Service Center, 400 W. Summit Hill Dr., Knoxville, TN 37902-1401.

Forms for updating your information also are on www.tva.com under Retirees.

Dam safety *continued from page 1*

says. "This includes small items such as cracked welds on spillway gates, and larger, more visible items such as the rehabilitation of Bear Creek Dam due to excessive seepage flows through the foundation. Over the past 20 years, TVA has modified many dams to improve their capability to pass extreme floods and withstand seismic events."

He says before they begin the inspection, they check previous inspection reports, instrumentation and drawings to tell them what they can expect when looking at the structure.

TVA's dam-safety inspections

- TVA follows Federal Guidelines for Dam Safety.
- Continuous maintenance and repair are essential.
- Safety is the No. 1 priority and every potential problem should be spotted before it becomes a major concern.

about every 15 months so dams can be examined at different times of the year.

Branam is in charge of mechanical, electrical and underwater inspections. His crew inspects dam features, such as spillway and intake gates and the related operating machinery, every two and a half years.

"We make sure all of the equipment works," says Branam, who has been inspecting dams since 1990. "That includes the diesel generators and the spillway gates and motors. We perform tests to insure that gates will open as needed to pass flood events.

"In one inspection at Fontana Dam, the crew discovered that one of the spillway gate chains was broken. In an Ocoee No. 1 inspection, an intake gate that shuts water off to the turbines was severely corroded and had to be replaced."

Above all is safety, Branam says.

"We make sure that everybody is focused on safety as the No. 1 priority and that every potential problem is spotted before it becomes a major concern," he says. "The dam-safety inspection crews ensure that proper pre-job planning and post-job analyses are performed. These include covering fall protection and working near water requirements.

"The work our group does ensures a very long life for TVA dams."
— BARBARA MARTOCCI



Mechanical Engineer Travis Simpson inspects one of the four spillway gates at Fontana Dam. Simpson and other inspectors are specially trained in safety practices and certified to do rope-access inspections. Pre-job briefings and job-safety analyses ensure that everyone involved is focused on safety.

Concrete can grow? Yes, indeed.

TVA has been dealing with the concrete-growth phenomenon at Chickamauga, Fontana and Hiwassee dams since soon after they were built.

Concrete growth is a reaction that occurs between alkali in the cement and the limestone used to make the concrete. This reaction causes the concrete to swell, resulting in development of high internal stresses and structural deformation of unconfined features such as spillway piers and navigation lock walls.

For a massive dam such as Fontana, the effects of the growth can be managed. However, at Chickamauga, the unrestrained growth of the concrete in the dam has resulted in significant forces being applied to the walls of the lock.

Slot-cutting to relieve stresses and post-tensioning to add structural strength are only interim measures. Since the growth cannot be managed in the long-term, a new lock at Chickamauga is being constructed, and the existing lock will be closed and stabilized.

Transmission system *continued from page 1*

And Independent Power Producers, or IPPs, are connected to TVA's system — some of whom sell power to TVA and some of whom sell power to customers

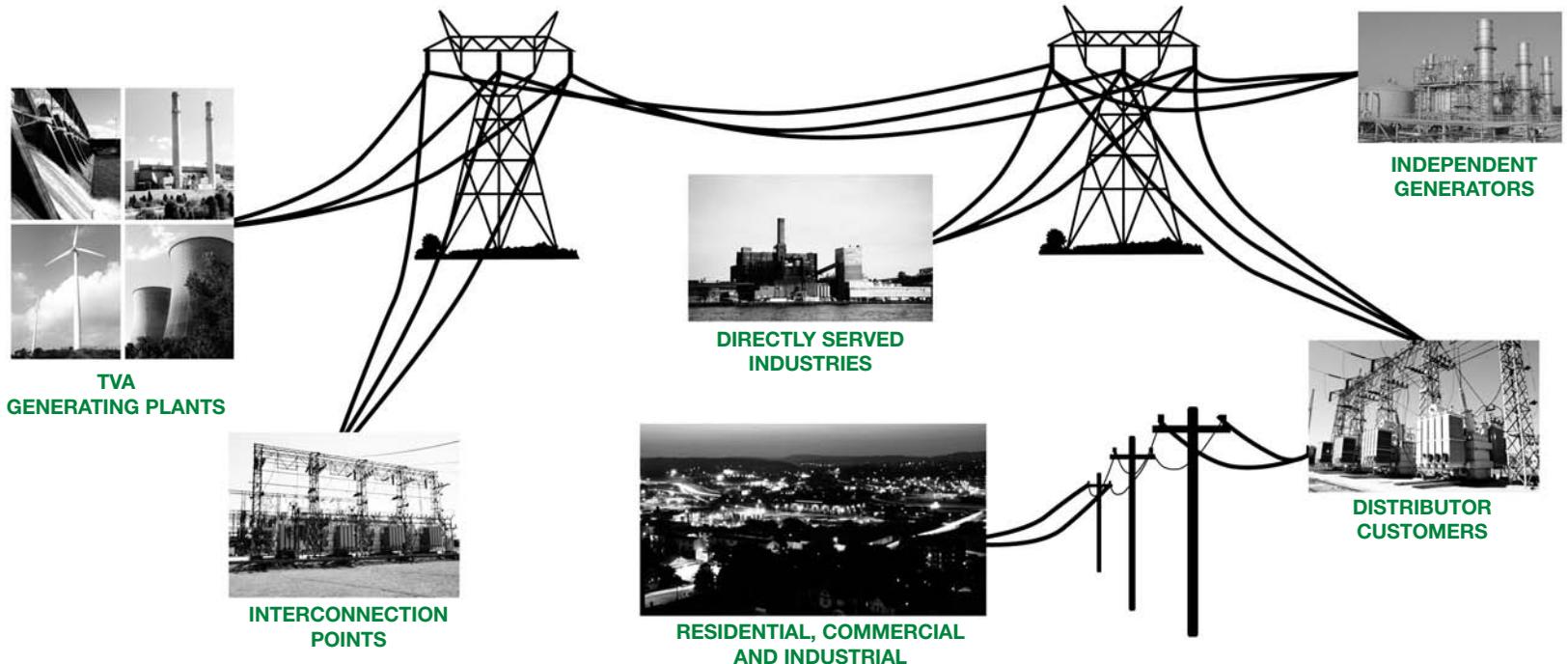
outside the TVA region.

The 1,523 employees in Power System Operations manage TVA's transmission system — a system so large and

complex that it has to respond "24/7/365" to ensure that the supply of electricity remains in balance with the demand every second of every day.

continued on next page

HOW WE SERVE THE REGION



Planning for new transmission *continued from previous page*

TVA has a primary responsibility to plan the transmission system to meet the steadily increasing demand for electricity in the region, which is about 2 percent a year.

“Each year, TVA performs a detailed planning analysis to determine where demand is increasing and how the system should be expanded or strengthened to accommodate it,” says David Hall, vice president of Electric System Projects. “For example, due to rapid growth in Middle Tennessee, TVA is planning a new 500-kilovolt substation in Rutherford County, along with 55 miles of transmission line in Rutherford, Williamson and Maury counties.”

Economic growth, changing population, location of new industry and the location of power plants all have an effect on the design of TVA’s system. And because transmission networks are interconnected, any of these factors affecting nearby systems will impact the TVA system. TVA works closely with power-distributor customers to plan new delivery points for power to their local distribution systems.

Deciding where to put new lines

“Like most utilities across the country, TVA struggles to find new transmission-line routes that are acceptable to communities and individual property owners,” says Hall. “Typically, TVA has several alternative sites or routes for new transmission projects. Part of the decision-making process includes input from the public, and we work with property owners to route a new line where it will have the least impact.”



TVA provides information about new transmission projects at open houses and solicits input from the public to help reach a decision on the best alternative.

When transmission lines are built on private property, landowners are compensated fairly for the use of their land based on the appraised value of the easement area and the impact of the lines on the property.

Building the lines

“TVA has a strong transmission system because it has added new lines and substations to keep up with growth,” says Hall. TVA uses in-house and contractor workforces to build and upgrade the system.

Operating the system

Originally, power systems were designed to take local generation to serve nearby consumers. Following the 1965 northeast blackout, utilities began to tie their systems together to allow power transfers to one another during emergencies or to buy or sell power over short distances.

“A fully interconnected grid has benefits and risks,” says Tim Ponseti, vice president of Transmission Reliability & Operations. “TVA is ‘interconnected’ with 12 neighboring power systems and routinely buys and sells power with them on a short-term basis. Since trouble on the grid can affect a neighboring system — or an entire region — we work closely with other transmission providers to reduce the risk of interruptions.”



TVA operates the power system from the System Operations Center in Chattanooga, where employees do the following:

- Plan how to meet the next day’s power demand

- Ensure that adequate generators and contracts for supplemental power supply are in place
- Order generators online and offline and control the amount of power they contribute to the system minute by minute
- Manage the delivery of power from outside suppliers
- Monitor the grid constantly to ensure safe and reliable operations.

Maintaining the system

“Keeping the lights on is a never-ending responsibility,” says Ron Rogers, vice president of Transmission Operations & Maintenance. “Interruptions that last even a few milliseconds can cause sensitive computer-operated machinery to malfunction or shut down, which can mean expensive losses for industry.”

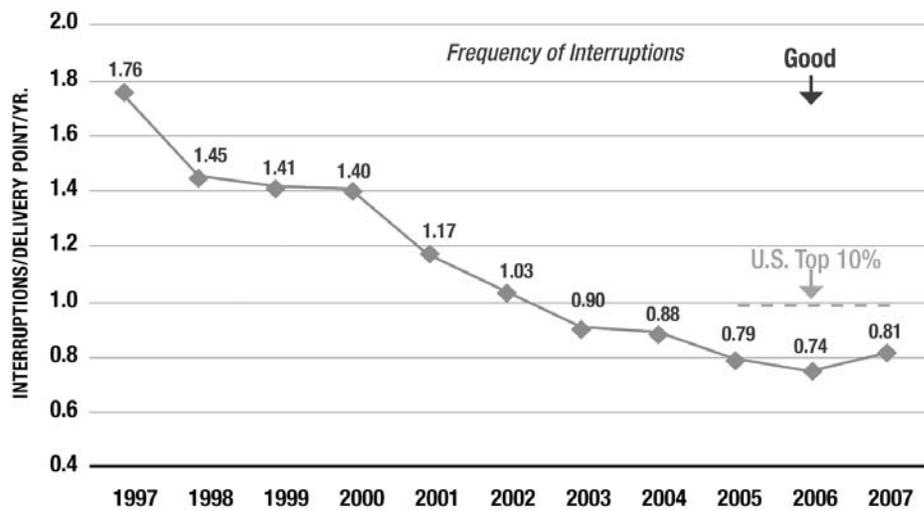
TVA has 18 Transmission Operations & Maintenance centers around the Tennessee Valley, with crews and equipment to make repairs in a short amount of time to any part of the transmission system.

“Weather is probably our greatest enemy when it comes to keeping the lights on,” Rogers says. “The lines occasionally are damaged by lightning, tornados or pulled down by ice and snow, but often we can restore service to communities through alternate sources within hours or days of damaging storms.”

TVA is proud of the fact that for eight consecutive years, it has provided 99.999 percent reliable service.



Customer Interruption Trend



“One way we measure reliability is by tracking the number of interruptions per delivery point over a year,” says Rogers. “TVA’s interruption-frequency trend has been steadily improving over the past decade, and we’re currently in the top 10 percent of transmission providers nationwide.”

Maintaining the right of way

In addition to maintaining the transmission equipment, TVA has to maintain the 260,000 acres of right-of-way underneath and around its power lines. TVA has 12 right-of-way specialists who make sure vegetation and trees are removed to prevent them from growing or blowing into the lines and causing an outage.

Safety

Safety is of utmost importance in building, maintaining and operating a healthy and efficient transmission system. Each employee strives to work in a safe manner, avoid mishaps and go home safely each day to their families. Power System Operations’ lost-time accident record topped 6 million workhours in 2003. Their recordable injury rate was among the top 10 percent — best decile — in FY 2007.

INSIDER

The super man of Almo

Keith Pardue considers himself lucky to be alive. His life was saved twice in the past seven years — the last time by his wife Debbie, who knew cardiopulmonary resuscitation, or CPR.

Riding his bicycle in an organized biking event in Kentucky on April 15, 2000, Keith Pardue literally doesn't know what hit him.

But he does know he suffered a severe traumatic brain injury, lay in a coma nine days, endured a feeding tube for four months, underwent 648 therapy sessions and had to live in a rehabilitation center away from their home in Almo, Ky. for a year. Despite his permanent double vision and hearing impairment, a fused right shoulder and extreme short-term memory problems, his doctors call him "a miracle."

"I don't know what happened, and no one saw it," says Pardue, who was manager for the Engineering & Maintenance Section at Land Between the Lakes when the accident occurred. "A nurse was around, and an ambulance took me to a local hospital. From there, I was airlifted to

Vanderbilt Medical Center in Nashville. I was told I had a 10-percent chance of living, but I fought back from certain death to discover a 'new normal' and a love of cycling in the form of a three-wheel trike called a 'recumbent.'"

During the early part of his rehabilitation, Pardue couldn't laugh, couldn't tell a joke and didn't recognize his wife of 35 years, Debbie.

"Everything takes energy for me," says Pardue, who had to take early retirement after his 2000 accident. He was 47 years old with 27 years of TVA service.

"And everything is an emotional and physical drain. But I don't have time for negative thoughts. I've read Lance Armstrong's books and have his quotes all over my house."

Armstrong is the seven-time winner of the Tour de France endurance event for bicyclists and a cancer survivor.

"My favorite Armstrong quotes are 'I have only good days and great days,' 'If you ever get a second chance at something, you have to go for it all the way,' and 'Don't give up. Don't EVER give up.' 'I WILL WIN' decorates my garage."

"I know a positive attitude has its healing powers."

Angels watching over you

Pardue's guardian angel Debbie must have been watching over him on May 17, 2007, when he had another unexpected "opportunity to live."



Keith and Debbie Pardue ride their trike along the road to their home. The recumbent tricycles hook together so Debbie can ride behind Keith. Keith had been encouraging the county to put up a Share the Road sign. It was in place when he arrived home from the hospital last May.

"I was riding my recumbent trike with Debbie in the Big Hill Challenge outside Lebanon, Tenn.," Pardue says. "We had planned to ride 31 miles, but right after we started riding, I began to feel light-headed and dizzy. The next thing I remember, Debbie was blowing in my mouth and pounding on my chest."

Debbie says he was not breathing. Once again, Keith was rushed to Vanderbilt Medical Center, this time for open-heart surgery. After two weeks, he was on the road to recovery out of the hospital, back in therapy and eventually back on the trike.

"Keith is a strong and determined person," says Debbie, who has known him since they were 14 years old. "All you have to do is present a challenge to him, and he rises to the occasion. He is a testimonial to the will to live. And his love of cycling has never left him."

— NANCY CANN

Seconds matter – CPR can save a life

Keith and Debbie Pardue urge everyone to learn cardiopulmonary resuscitation, or CPR.

"I never thought I'd ever have to use it on my second-graders," says Debbie, who was a teacher in Kentucky before Keith's May 12 open-heart surgery to repair a faulty valve. Debbie had taken CPR as part of her training. Keith had learned CPR when he was working with TVA at Land Between the Lakes.

"You just never know when you will have to use it," she says. "Seconds matter."

In Keith's case, CPR saved his life.

For information on CPR training, go to the American Red Cross Web site at www.redcross.org/services or call the American Red Cross in your area.

IN THE NEWS

Fun, fellowship and food

John Sevier Fossil Plant retirees and a guest are invited to get together with former co-workers at the plant's Christmas dinner Wednesday, Dec. 12. The dinner, sponsored by the JSF Co-operative Committee, will be at 11:30 a.m. in the plant assembly room. For more information, call Sonia Trent at 423-921-6611 or e-mail her at sh Trent@tva.gov.

TVA, NuStart submit application to Nuclear Regulatory Commission

TVA and NuStart Energy representatives have presented an application for a new nuclear-power plant to Nuclear Regulatory Commission officials.

"TVA is pleased to be the applicant for the combined operating license that NuStart is seeking for two new advanced nuclear reactors at our Bellefonte site in North Alabama," says TVA Chief Operating Officer Bill McCollum. "Submitting the reference application for a Westinghouse AP1000 nuclear plant is the first step of a comprehensive NRC review process that

will simplify license applications for future plants of the same design."

NuStart, the nation's largest consortium of nuclear-energy companies, selected two sites in September 2005 for the development of combined operating license applications for advanced design nuclear-reactor plants. TVA's Bellefonte site was selected for the Westinghouse Advanced Passive (AP1000) design, and Entergy's Grand Gulf site in Mississippi was selected for a General Electric plant design.

Under the new NRC application process, utilities will seek an operating license and a construction permit at the same time, which will reduce their financial risks and simplify the licensing of nuclear-power plants.

NRC's review of the combined operating license application is expected to take about four years.

If approved by the NRC, the license to



At the Bellefonte application submission event in Washington D.C. are (from left) Sen. Lamar Alexander, Rep. Zach Wamp, Sen. Pete Domenici, Sen. Bob Corker, Rep. Sue Myrick, Rep. Bud Cramer, Rep. Marsha Blackburn and Rep. Gresham Barrett.

build and operate a two-unit plant at the Bellefonte site in Hollywood, Ala., would be issued to TVA.

The TVA Board would decide whether to build a new nuclear plant at the site.

"Participating with NuStart in this application is a cost-effective way to preserve TVA's nuclear-power option for the future as we continue to explore and develop the best alternatives to meet growing demand

for electricity in the Tennessee Valley," says McCollum. "Like other utilities, we face long lead times to build and start new plants needed to meet around-the-clock baseload power demand."

McCollum says TVA has not decided to build a plant at Bellefonte. However, obtaining the necessary license will give TVA more certainty about the cost and schedule of a nuclear option for future decisions.