



Global Technical Training Services, Inc. Newsletter



The State of the Industry

Sid Crouch, GTTSi Chief Technical Consultant

Today the reality of **global energy poverty** raises an uncomfortable paradox. How do we limit carbon emissions but provide adequate energy to everyone without fossil fuel? There is just no way around it despite what you might hear. Fossil fuels are still the greatest source of energy on the planet. Almost 90% of the energy used in developing countries is produced from coal-fired power plants, where they are the easiest to build due to their limited infrastructure. It's not the best, it's certainly not the cheapest, but it is the easiest. Analysts see the use of fossil fuels doubling by 2040. Just look at China. Over the past 20 years they have lifted 600 million people out of poverty by constructing hundreds of coal-fired power plants. And in Africa, responsible for only 3% of the world's carbon emissions, they are suffering a disproportionate amount of the negative effects: water stress, reduced food production, increased frequency of extreme weather events, and low economic growth. How can we give these countries the energy they need without using coal? The world's leading climate experts realize that our climate goals cannot be achieved without a significant boost in nuclear energy. The International Atomic Energy Agency believes the development of small modular reactors and advanced nuclear technologies could allow these countries to overcome their energy dilemma. This will require solutions to some significant challenges - initial cost, construction timelines, and weak institutions. We must figure this out! **Net-Zero and our global neighbors need Nuclear.**

I welcome your comments or questions - sid.crouch@gttsi.com

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Did You Know?

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STRUGGLE CONTINUES FOR ZAPORIZHZHIA NUCLEAR POWER PLANT

The struggle continues for the operators at Zaporizhzhia Nuclear Power Plant (**ZNPP**). The Russian forces are steadily increasing pressure on the operators by forcing them to obtain Russian passports and pushing them to sign contracts with Russia's nuclear generation operator, Rosatom. Those that have snubbed signing a contract with Rosatom are being coerced with psychological pressure and being selectively deprived access to the plant without warning. In addition, Russian security operatives are attempting to sow distrust, creating conditions for anonymous reporting through special bots on Telegram, the messaging app.

At the same time, dissatisfaction is growing among Rosatom's energy specialists stationed at the plant. Their two-month deployment has turned into 6 months or more, due to how difficult it is to find qualified specialists in Russia willing to replace them. In addition, the qualifications of the specialists currently at the plant are in question. According to the Ukrainian State Nuclear Regulation Inspectorate, the Russian specialist deployed at the plant are viewed as incompetent.

It has been eighteen months since the Zaporizhzhia Nuclear Power Plant was captured by the Russian forces in March 2022. In August and September of 2022, there were bombings around the nuclear plant. The Ukraine and Russia blamed each other because it inflicted damage on the reactors and/or the spent fuel, evidenced by the leakage of radioactive materials. In June of 2023, the Kakhovka Dam, the source of cooling water for the plant was breached and today, the



*Zaporizhzhia Nuclear Power Plant
Photo Credit: Department of Energy*

Kakhovka reservoir is dry. While the nuclear plant's cooling water reservoir is still sufficient, its supply of water will be a problem for quite some time. (**See pictures on following page. The nuclear plant's reservoir is at the bottom right of the photo.**)

Around this same time, the reactors at Zaporizhzhia reached temperatures above 100 °C. Although this does not cause an immediate concern for the reactor fuel, the discontinuation of cooling water injection with the temperate at boiling does. Should this condition continue, the nuclear fuel would become exposed and could result in increased fuel temperatures, which if allowed to continue would eventually result in major fuel damage and meltdown. Since a large amount of hydrogen is generated before fuel meltdown, a hydrogen explosion could occur, spreading radioactive material over the area. In which case, contamination will spread to the Crimean Peninsula and the Black Sea, and even Russia could not *(continued)*

avoid the damages. This would have an incalculable impact on the world in terms of food security. A rich black earth region lies in the Dnieper River basin, and central and southern Ukraine have been known as the “granary of Europe” since the 19th Century.



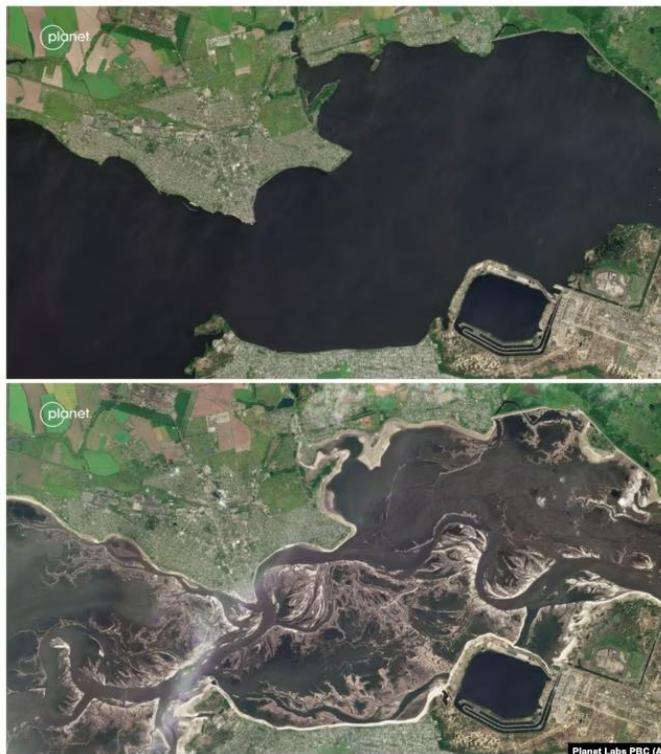
Ukraine has one of the most fertile soils in the world, known as “chernozem” which translates as black earth.

Meanwhile, the IAEA (***International Atomic Energy Agency***) announced on July 29, 2023, that the No. 4 Reactor at the ZNPP was shifted from “cold shutdown” with temperatures under 100 °C in the reactor to “hot shutdown” with temperatures above 100 °C. Subsequently, while Reactor No. 4 returned to “cold shutdown”, Reactor No. 6 was switched to “hot shutdown”. In October, Reactor No. 6 was returned to “cold shutdown”, while No. 4 was switched to “hot shutdown” again. These were all steps taken by the Russians occupying the nuclear plant.

Ukraine officials have criticized Russia, stating that “Ukrainian safety standards stipulate that cold shutdown is the rule for suspending operation of the Zaporizhzhia reactors. Switching to hot shutdown is prohibited”

because there is a risk to the nuclear fuel should cooling water fail to be injected to the reactor. The Russians did this to have heat during the winter. The IAEA proposed setting up external boilers on the Zaporizhzhia NPP grounds instead of rotating reactor units in and out of “hot shutdown.” However, setting up the boilers is not expected to take place until the first half of 2024. This means that for the time being, the reactors will most likely be rotated in out of “hot shutdown” to “cold shutdown” for heat.

Two IAEA officials are currently stationed at the ZNPP. It is hoped that as the watchdog of nuclear energy, the IAEA will persist in its work to persuade Russia and Ukraine to understand the potential risks of nuclear power generation and prevent a situation that may affect a wide area, including the neighboring countries. 🌐



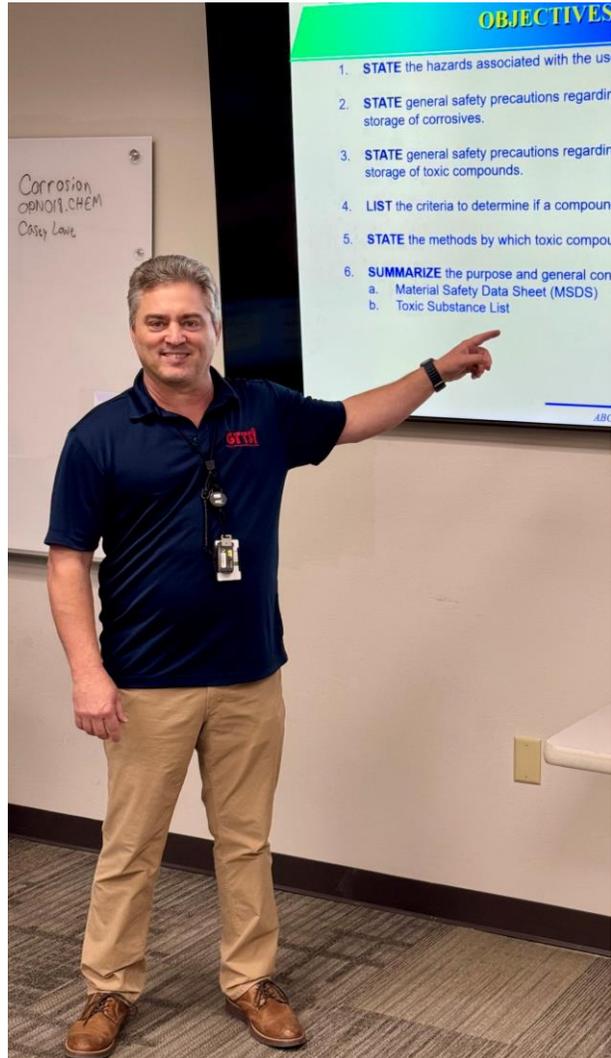
***Kakhovka Reservoir and Zaporizhzhia Nuclear Plant Reservoir June 5, 2023 vs. June 18, 2023
Photo Credit: Planet Labs PBC***

GTTSi TEAM MEMBER HIGHLIGHT: JOEY WHITE

Meet GTTSi team member Joey White. Joey is on an assignment with TVA (Tennessee Valley Authority) at Watts Bar nuclear power plant. Joey has over 15 years' experience in commercial nuclear power and data center operations – working as a Non-Licensed Operator (**NLO**), Control Room Qualified NLO, Fleet Training Instructor at Duke Energy's Processing Center in Kings Mountain, NC, Data Center Technician, ASME Level 3 Qualified Test Engineer, and Outage Command Center Operations Manager.

During the past three years, Joey has been at Plant Vogtle supporting the Initial Test Group during system preparation and Hot Functional Testing for the eventual commercial operation of their AP-1000 nuclear power plants. Prior to that, Joey spent over twelve years at Duke Energy Corporation as a Nuclear Operator, Nuclear Operations Technician, and Deployment Specialist.

In the execution of his assignment at Watts Bar, Joey is working with the training group as an instructor for the NLO class, teaching various plant systems including how to use log readings for analysis and troubleshooting. In addition, Joey is providing training on print reading, system lineups for operation and shutdown, surveillance/test procedure use, procedure revision requirements, equipment



Joey White at TVA Tennessee Valley Authority Watts Bar Nuclear Plant

tagout requirements, and interactions required during normal and emergency operations (**rack-out/rack-in of electrical breakers, diesel operation, safety, HU, FME**).

GTTSi is proud to be a part of the important work done by TVA, and our participation is made possible by working with experts like Joey White. He is just one of the many industry experts at GTTSi - check us out at www.gttsi.com or on LinkedIn at www.linkedin.com/company/gttsi. 



*Watts Bar Nuclear Plant Near Spring City, Tennessee
Photo Credit: TVA.com*

POLAND'S 1ST NUCLEAR POWER PLANT TO BEGIN CONSTRUCTION IN 2026

Poland is planning to build their first nuclear power plant. Their design of choice is the Westinghouse AP-1000 new generation plant. After extensive environmental impact examination and analysis, the Lubiatowo-Kopalino Site in Pomerania, near the Baltic coast was selected.

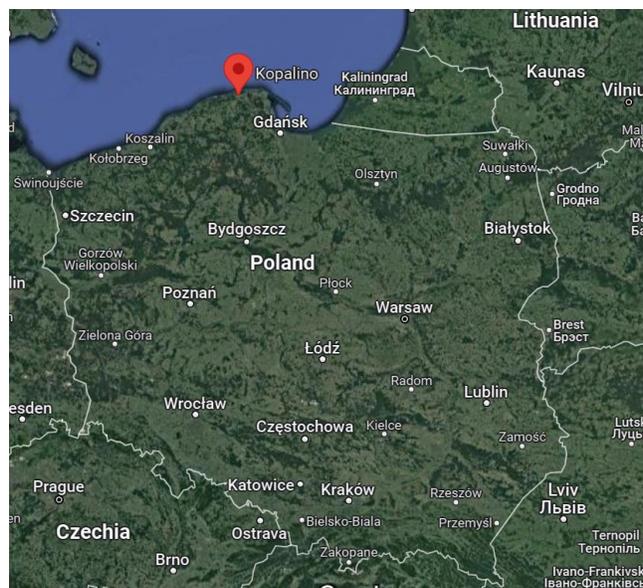
Bechtel and Westinghouse have signed a partnership agreement to design and build the facility. They expect to begin construction in 2026 with a goal of achieving commercial operation in 2033. Poland's Ministry of Economy said they are planning to generate 12% of their electricity from nuclear by 2030, and this plant is their first big step in achieving this goal.

Bechtel and Westinghouse have partnered before to complete the Plant Vogtle Project (**Vogtle Units 3&4**) in the United States. Vogtle Unit 3 is currently in commercial operations and Unit 4 is expected to reach commercial operations in the first quarter of 2024. The experience and knowledge gained during construction at Vogtle should help streamline construction at Poland's Lubiatowo-Kopalino Site in Pomerania, located less than 200 miles from the Germany border which shut down it's last nuclear units last spring.

In September 2022, Westinghouse announced a memorandum of understanding with 22 companies in Poland to cooperate on the construction of AP1000 reactors in the country and at other locations in central Europe. The company also agreed to set up a major engineering center and invest in the training and development of the workforce. This was followed by an agreement between Westinghouse and Polish utility PEJ (**Polskie Elektryczne Jądrowe**) to define the main principles and path forward for the project.

Westinghouse Energy Systems president David Durham said, "This is a team with demonstrated ability to deliver on large nuclear energy projects. The fleet experience we have earned with our advanced, proven AP1000 technology, including a 100% complete design and construction lessons learned, will serve Poland well as it seeks decarbonization and increased energy security."

Bechtel Nuclear Security and Environmental global business unit president John Howanitz said: "Bechtel and Westinghouse bring more than 140 years of combined nuclear power experience. Together, we have both the proven technology and the hands-on experience required to build Poland's first-ever nuclear energy program. We are eager to partner with the local workforce, suppliers and community to deliver the clean and reliable energy Poland needs."



Lubiatowo-Kopalino is the company's preferred location due to environmental aspects, socio-economic factors, and nuclear safety.

Photo Credit: Google.com/maps

SAVANNAH RIVER SITE AND DENMARK TECHNICAL COLLEGE ESTABLISH LIQUID WASTE APPRENTICESHIP PROGRAM

The Savannah River Site (**SRS**) is owned by the U.S. Department of Energy and is located in Aiken, Allendale and Barnwell counties in South Carolina. It was built in the early 1950s to produce materials used in nuclear weapons and now processes and stores nuclear materials used in nuclear weapons, and develops technologies to treat nuclear waste.

About an hour away is Denmark Technical College (**DTC**), a public, historically black, two-year technical college located in Bamberg County, South Carolina, which began operation in 1948.

In a partnership that has been growing over the years, these two entities have teamed up again to attract new companies to South Carolina and provide workforce solutions to ensure employees stay and grow in their jobs. The Savannah River Mission Completion, the liquid waste contractor at SRS, and DTC have designed and initiated the Liquid Waste Nuclear Operator apprenticeship.

The class curriculum is designed to prepare new employees for work at the Savannah River Site and is part of DTC's Nuclear Fundamentals Certification Program. The course takes 7 months to complete and consists of chemistry, physics, engineering, and radiation fundamentals – completing two college level classes in an abbreviated semester. Part of this training includes SRS regulatory courses, facility training, and other requirements.

Attendees will participate at DTC two days a week and spend two days a week at SRS.

There are eight new hires participating and should complete their training in April 2024. As Liquid Waste Nuclear Operators they will be responsible for keeping the liquid waste facility in safe working condition, which includes operating and monitoring equipment, taking instrument readings, and adding chemicals as needed. This apprenticeship program has a long-standing history at DTC, but its inclusion into the Nuclear Fundamentals Program elevates its relationship and provides the new hires the opportunity to obtain a meaningful career, with a pathway to other positions within operations at the Liquid Waste Facility.

In addition, MOU (**Memorandum of Understanding**) has been signed to develop an enhanced STEM (**Science, Technology, Engineering, & Mathematics**) program to further broaden career opportunities at SRS.



Photo Credit: Denmarktech.edu

DID YOU KNOW?



Photo Credit: Daniel Andraski

The Biden-Harris Administration recently announced \$46.5 Million in funding to enhance access to electric vehicle charging and grow the clean energy workforce. With the growth of EVs, the Administration has a goal of building a network of 500,000 public EV charging ports by 2030. According to the release, the awards will increase reliability of chargers through testing and validation, advance new business models for electrified shared mobility and fleet-based services, and provide new jobs and training resources in the electric sector. Said **U.S. Secretary of Energy Jennifer M. Granholm**. “Today’s funding helps drive the nation forward toward an equitable clean transportation future – one that energizes local economies and builds more resilient communities.”

There are currently 60,840 Electric Vehicle charging stations with 162,429 ports in the United States. California has 15,598 of those stations with 43,505 ports. New York, Florida, and Texas follow California with approximately 3000-4000 stations each. For perspective, if you find yourself driving in Alaska or South Dakota, you’ll have to locate one of the harder to find 62 locations and 121 ports or 91 stations and 224 ports, respectively. Thankfully, the Department of Energy publishes the Alternative Fueling Station Locator at the **Alternative Fuels Data Center** website. Just filter by fuel type and you can map your route.

<https://afdc.energy.gov/stations/#/find/nearest>

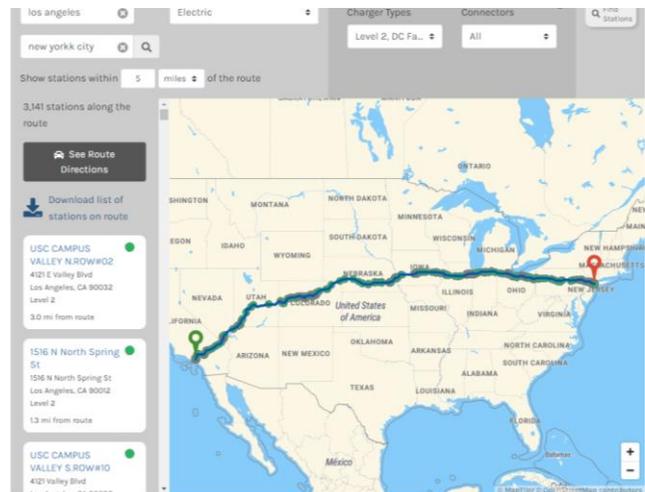


Photo Credit: US. Department of Energy



*Shidao Bay Nuclear Power Station, commonly known as Shidaowan
Photo Credit: Tsinghua University*

After a decade-long endeavor and 168 hours of testing, the Shidaowan Generation IV Reactor has entered commercial operation. Shidaowan is a High-Temperature Gas-Cooled Pebble-bed Module reactor. Nearly 94% of the equipment needed for completion of this project was manufactured by Chinese companies. HTGR technology is set to reshape the future of global nuclear power. This design claims the reactor will remain safe even in the case of the failure of all cooling systems, preventing core meltdown and radioactive material leakage without any intervention.

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GTTSi Job Board

GTTSi has been providing professional services to the energy and nuclear industry since 1980. We are an MWBE (*minority woman-owned business enterprise*) and have served over 80% of the US commercial nuclear facilities, 8 Federal agencies and prime contractors, and one foreign government. If you are qualified and interested in any of the job opportunities listed below, please contact us at ginfo@gttsi.com or call **864.882.3111**.



- **Transmission Line Principal Engineer, Juno Beach, FL**
- **BRW SRO Instructor -Cooper Nuclear Plant**
- **PWR SRO Instructor, Texas**
- **E&C Project manager -Juno Beach, FL**
- **E&C Project Estimator -- Juno Beach, FL**

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