Independence Excavating, Inc.

Salt River Project: Navajo Generating Station Decommissioning & Demolition

Category 2 – Meeting the Challenge of a Difficult Job – Specialty Contractor

The decommissioning and demolition of the Navajo Generating Station in Page, Arizona was a massive undertaking executed by Independence Excavating, Inc., (IX) including logistical, environmental, engineering schedule and global pandemic challenges, setting the bar high for overcoming difficult obstacles. IX navigated, managed, and performed successfully, utilizing a partnering approach with the Owner, Salt River Project, and Construction Manager, Tetra Tech. The project commenced in the spring of 2020 and then idled as COVID cases rose in the area after just one month. The project restarted four months later, with strict adherence to the COVID protocols and protections in place, allowing the work to progress with minimal impact. Through the remainder of the project, the team mitigated environmental challenges managing multiple regulated materials, engineering challenges in the sheer magnitude of the demolition work, logistical challenges in the location on lands close to sensitive environmental areas of Lake Powell and the Navajo Reservation and 10 hour drive from recycling facilities, and schedule challenges to recover the project back to, and ahead of, pre-COVID deadlines. Our team met, managed and set new standards for handling difficult challenges performing the work with an exemplary safety record, working over 200,000 man-hours without a single lost time incident. Our team's approach to safety culture fosters buy-in from employees at every level. From management to the field, all employees are empowered to control, prevent and mitigate safety hazards.

The Salt River Project (SRP), headquartered in Tempe, Arizona selected Independence Excavating, Inc. (IX) of Cleveland, Ohio as the demolition contractor for the Navajo Generating Station Decommissioning & Demolition (NGS) project in December 2019. The overall plant demolition and decommissioning program was managed by Tetra Tech and included follow-on contracts for landfill, and civil restoration after the demolition. The ultimate goal of the decommissioning program was to demolish the plant, restore the property from any environmental impacts, and return the land to the Navajo Nation. The demolition phase of this project

commenced in March 2020, and will be completed in January 2022. The substantial completion of the structural and building demolition was completed in June 2021.

NGS was constructed in the early 1970's operating as a 2,250 megawatt coal-fired power plant located in the Navajo Nation near Page, Arizona. The NGS which was owned jointly by SRP, The United States Bureau of Reclamation, NV Energy, Tucson Electric Power, Arizona Public Service, and the Los Angeles Department of Water & Power, supplied electrical power to Arizona, California, and Nevada and provided power for pumping the Colorado River to central and southern Arizona. In the fall of 2019, the plant ceased operation and SRP, on behalf of the plant owner began the decommissioning process. At one time, the plant employed close to 1,200 people, including the nearby-dedicated coal mine and railroad to supply up to 40,000 tons of coal per day. The majority of those dedicated employees were from the Navajo Nation, and as part of this project, IX worked closely with members of the Salt River Project to meet workforce goals including a Navajo hiring preference, hiring over 50 Navajo people through the course of the project for skilled jobs.

Our scope encompassed 300 acres, and included the demolition of three 775 foot stacks, three 20,000 ton boilers, precipitators, a 150,000 square foot turbine bay with three elevated turbine decks, six cooling towers, rail unloading facilities, and environmental and treatment units. The total structural steel tonnage on the job is approximately 120,000 tons. The decommissioning project also includes over-seeding the land with native plants before it is returned to the Navajo Nation.

Prior to demolition, the first task was the environmental preparation of the plant including the removal of regulated oils and liquids from vessels, pipes, and lines. This task included multiple environmental crews and management of over 600,000 gallons of liquids for either disposal or recycling and re-use. A large component of those liquids was left over fuel oil that was able to be shipped off-site and used as fuel on other plants rather than disposed. In all, over 92% of the demolished materials were recycled, including metals, concrete and liquids.

Another environmental component included the management of the 78-in diameter circulating water pipe system supply and return lines. These lines included a coating with both asbestos and PCBs. With multiple pipes running parallel and up to 37 foot deep, this became an environmental remediation project with mass-earth proportions.

Much of the project was performed with conventional demolition working our way through the plant units with shears, grapples, hammers and torches. Each of the 17 buildings/units were evaluated by a structural engineer confirming the safety of the demolition, and especially the individual workers executing of the demolition.

A key innovation in the execution of the work involved the use of explosives on structures of this scale and magnitude. Five components of the plant employed the use of explosive felling; two sets of stacks, six in total, the precipitators, the boilers and the turbine units. The use of explosives in a designed charge saved countless equipment hours as well as man-hours in high-hazard situations. The felling of the three iconic 775 foot stacks was practically a community event as spectators from afar watched them come down marking the end of the 45 year plant history. The precipitator and boiler blasts used thousands of shape charges to strategically cut legs in a safe sequence to fell the units in a designed fashion of both timing and direction. The boilers fell on March 3, 2021 in a single shot bringing the three 245 foot tall structures to the ground in a matter of seconds. The shot of the boilers was designed and executed to fell the boilers away from the connecting turbine bay building, where the next phase of work was on-going. This was executed with strategic precutting under the supervision of Structural Inspection and Design of St. Louis, MO and was completed successfully with the turbine building remaining without any damage or structural impact. There has never been such a large explosive felling with so little damage to a structure remaining just inches away.

Another significant challenge of the project was the material processing, handling and disposal off-site. Over 120,000 tons of material, consisting of over 35 different commodities was intricately demolished, sorted and shipped off site for recycling, with very little solid waste requiring landfill disposal. The magnitude of the plant and schedule of the work generated significant amounts of steel and recyclable material requiring expeditious handling just to keep up. The variation in materials from structural steel, to non-ferrous and specialty metals required explicit attention to detail and organization in order to manage and separate these components properly for recycling, and the largest challenge was the remote location in Page, Arizona and the logistics to transport the material over the roads to haul off-site. This effort took the hourly coordination of loading and trucks to ensure efficient operations.

Key components of the project that made it a success include:

1) the coordinative efforts among IX with both the Owner (SRP) and Construction Manager (Tetra Tech) as well as our subcontractors and supplier team members including Demtech LLC (Explosives), Dykon Explosive Blasting (Explosives), Special Inspection and Design, TMS International (Material Handling), J&J Contracting (Universal Wastes), Ecology Recycling (Trucking), and many other team members;
2) the pre-planning and seamless execution of critical tasks, as well as supporting associated tasks to utilize available resources effectively and efficiently;
3) the dedication, hard work and safety consciousness of our labor force working double shifts and weekends to maintain the pre-shutdown milestones;
4) the overall management of safety, specifically in critical task and high-risk activities, and;
5) the establishment and execution of a comprehensive demolition plan and critical path schedule and the success in monitoring, updating and adjusting as necessary.

Beyond the limits of the project and in support of the local community, IX shipped multiple care packages of supplies to Navajo reservation medical centers and chapters when COVID cases were crippling the area. Truckloads of water tanks, and delivery systems were purchased and given to local families that struggled to access and retain water in the Arizona climate. IX and the DiGeronimo Companies also provided community sponsorships for area youth sports and 4H throughout the project.

IX is pleased to submit this project based on its magnitude, success in schedule execution and outstanding safety record, working more than 200,000 man hours without a lost time incident. We are honored to be partners with SRP, Tetra Tech, and our subcontract team members, and are proud to be part of improving the environmental condition of the area, especially so close to the resources of Lake Powell, Glen Canyon, and the Navajo reservation. We are excited to share the success of this project with our industry peers and look forward to opportunities to continuously improve and build on our experiences.