

# BALANCE OF PLANT, BOTTOM ASH CDR SYSTEM

**CLIENT:** CONFIDENTIAL  
**MARKET:** Power Generation  
**LOCATION:** Aquasco, MD  
**SERVICES:**

- Project Management
- Structural Engineering
- Mechanical Engineering
- 3D Laser Scanning
- Electrical & Controls Engineering
- Construction Administration
- Subcontractor Management

**COMPLETED:** 2020  
**VALUE CLASS:** <\$250,000

**ABOUT:** *The Client is a competitive independent power producer that owns approximately 10,338 MW of electric generation facilities primarily located in the Northeast United States and in California.*

## CHALLENGE

The Client's Generating Station Units 1 and 2 are pulverized coal boilers, each with a three-ash hopper and economizer ash transfer tank. A mechanical pump-based sluice system was previously utilized to convey bottom ash and economizer ash to dewatering bins. The dewatering bins overflow into surge tanks. In addition, bottom ash hopper overflow water is currently pumped from the bottom ash hopper overflow sumps to the surge tanks.

The major problems the plant experienced with the previous system included excessive water usage, over-boarding and high fines carryover to the surge tanks. To mitigate these problems, the Client purchased a Continuous Dewatering and Recirculation (CDR™) System, which is designed to substantially reduce material carryover. With the CDR system, the existing bottom ash/economizer ash slurry conveying lines were directed to the inlet of a remote submerged flight conveyor (SFC), instead of to dewatering bins. The bottom ash hopper overflow piping from both Units were directed to the inlet of the SFC. The overflow water from the discharge end of the SFC flows by gravity to the existing Unit 2 surge tank.

**TAI's expertise was needed to execute the balance of plant integration design for the Client's new conveyor system.**

TAI provided project management, engineering and design, and construction administration support for the system. TAI's project management staff oversaw the subcontractor that conducted subsurface investigation, geotechnical and civil engineering to assist with the site preparation and subsurface work needed for installation of the new conveyor system and the associated foundations designed by TAI.



## SOLUTION

TAI Structural Engineers and Designers visited the site frequently to gather and review field dimensions and model data from 3D scans. Structural personnel also gathered data of the existing surrounding construction and the location where the conveyor equipment would be installed. TAI used the field information to analyze, assess, design, and detail the structural tasks such as a helical pile supported foundation slab for the CDR, SFC and SFC bunker as well as pipe supports and evaluations associated with the effect of the installation on the existing building steel.

TAI evaluated the data from scanned areas to determine what utilities and structural support network may be underground. Site layout/staking to place the major equipment was completed by a TAI structural engineer/designer. TAI used the geotechnical, civil and underground investigation information to address and perform project tasks. TAI provided construction documents for the mechanical services for a new floor drainage system in the affected area of the plant.

The project included five (5) different electrical loads that accompany the Bottom Ash Handling System installation. TAI provided motor starters/panels as applicable as well as a manual transfer switch to be able to provide power from either of the motor control centers. TAI also provided a tie-in plan and design cable routing (including hangers and supports) from the tie-in points to the SFC area. Electrical design included cable tray and conduit routing, panel locations and similar electrical attributes as indicated by layout in the 3D model.

TAI provided detailed design and development of construction documents to include; Electrical Title Sheet with Legend, partial Electrical Single Line Diagram, partial Electrical MCC & Panel Schedules, Electrical Floor Plan – Power, Grounding Grid Modifications, Electrical Floor Plan – Controls & Instrumentation, Conduit Block Diagram, Grounding Grid Tie-in Plan, Cable and Raceway Schedules, and a Lighting Plan & Schedule.

As construction began, TAI also supported the project in a construction administration role for which TAI was responsible for reviewing contractor submittals and requests for additional information. TAI sustained this role through completion of the installation. This effort provided value to the customer throughout the construction phase in supporting the Client's best interested in the realm of safety, quality, and cost effectiveness.

## RESULTS

TAI provided balance of plant engineering services, project management, engineering and design, and construction administration support for the installation of bottom ash conveying and dewatering system. This project is another example of how TAI's multidisciplinary services and 16 divisions provide a one-stop solution for major industrial projects. TAI's specialized professional talent works on a wide range of projects for Owners, developers, manufacturers, large design/build firms, equipment suppliers and integrators alike, to complete routine and complex jobs.