

Meldahl Hydroelectric Plant Technical Tour

October 2023



Welcome.

We are thrilled to welcome you to the Meldahl Hydroelectric Plant tour as part of NHA's Clean Currents Conference. The City of Hamilton and American Municipal Power, Inc., are proud to have developed the largest hydroelectric power plant on the Ohio River. This 105-MW run-of-the-river hydroelectric power plant fulfills the shared purpose of helping communities meet their power supply needs efficiently, reliably and economically, through clean, renewable hydroelectric power generation.

Enjoy your visit!

City of Hamilton
BUTLER COUNTY OHIO



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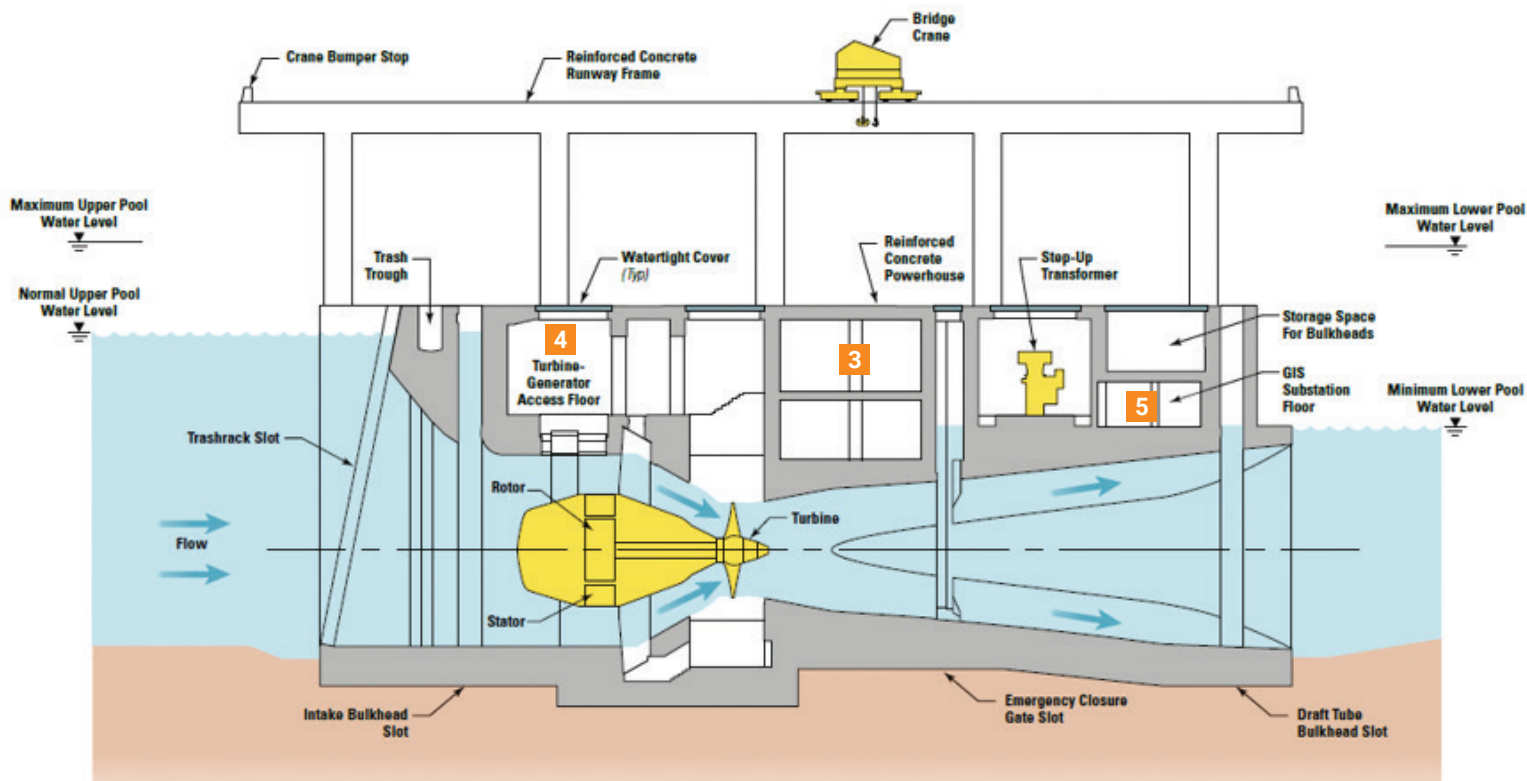
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CONCRETE CONSTRUCTION
expect more

VOITH



The Meldahl hydroelectric plant at the Captain Anthony Meldahl Locks and Dam diverts water from the existing U.S. Army Corps of Engineers' (USACE) dam and generates an average annual output of approximately 558 million kilowatt-hours (kWh). The run-of-river plant is fed by a 1,850-foot-long approach channel that directs water from the Ohio River to the powerhouse. The site includes an intake approach channel, a reinforced concrete powerhouse, concrete dam and hardfill closure structure, a tailrace channel, and two recreation areas. The powerhouse contains three horizontal bulb-type turbine and generating units with a total rated capacity of 105 MW.

DESIGN INNOVATIONS

Cofferdam Arrangements

The powerhouse was located inland, permitting the construction of embankment type cofferdams rather than requiring cellular sheet piling. This minimized cost, optimized hydraulics and enabled all existing USACE spillway bays to remain open during construction.

Monolithic Powerhouse

The multi-unit powerhouse is designed as a single monolith, eliminating the need for contraction joints between units, reducing the powerhouse size, and the amount of reinforcement and concrete in the structure.

Submersible Powerhouse

The powerhouse is designed to be overtopped by as much as 25 feet during high river flows, alleviating potential upstream flooding and eliminating the need for auxiliary spillways.

Closure Structure

The landside closure structure ties the powerhouse to the existing riverbank. It is constructed of hardfill, maximizing the use of on-site materials and minimizing the costly importation of additional aggregates, cement, etc.

CONSTRUCTION STATISTICS

- 2.45 million labor hours
- 425 peak manpower on site
- 1.1 million cubic yards (CYs) of total excavation
 - 102k CYs of rock (utilizing explosives)
 - 626k CYs of underwater/dredging
- 173k CYs of riprap placed
- 114k CYs of concrete placed
 - 900+ individual concrete placements
 - 12.8M lbs. reinforcing steel
- 30.8 miles of piping
- 16 miles of conduit
- 81.5 miles of power cable
- 7 miles of fiber optic cable
- 5,500 GPM dewatering system (24/7 operation)

558

Million Kilowatt-hours:
annual output of power

900

Individual concrete
placements

400+

Construction workers in
various trades during the
peak of construction

2016

Reached full commercial
operation



TOUR STOPS

1 Upstream Operating Deck

At this location, visitors will be able to view the approach channel and powerhouse intakes while learning about the intake channel hydraulics, intake trash racks and rake, log grabber, and the trash sluice.

2 Closure Structure

Here visitors will learn about the innovative design of the closure structure that ties the powerhouse to the riverbank including hardfill materials, design details, and construction aspects.

3 Control Room

The brains of the powerhouse, the control room visit will provide visitors with an inside look at how the powerhouse is run and monitored while learning about the plant's performance.

4 Turbine/Generator Access Floor

At this stop, visitors will see the access to the bulb units, learn about the four bladed Kaplan turbine, the governor, cooling water pumpstation, and other ancillary equipment while also peering down at the outer gate barrel and wicket gate servomotors.

5 Main Power Transformer Floor

The unique indoor locations of the transformers will be viewed on this tour stop along with a viewing of the station service switchgear, gas-insulated substation, station service switchgear, and the battery room.

6 Downstream Operating Deck

This stop of the tour will allow visitors to view the tailrace channel and recreation facilities while learning about the emergency closure gates, overhead crane, draft tube bulkheads, and tailrace channel hydraulics.



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