

John Dean Adams Power Plant

Much has been written about the history of the John Dean Adams Power Plant at 1501 Buffalo Avenue, Niagara Falls, NY, USA. Rather than attempt to repeat that information, the reference below are very informative. This article will cover only the history of the power plant as I know it. This articles also contain great list of references for further information.

https://en.wikipedia.org/wiki/Edward_Dean_Adams

Historic Preservation Industrial Reconnaissance Survey: CITY OF NIAGARA FALLS, Niagara County, New York, NOVEMBER 2007, <https://buffaloah.com/surveys/nfindustrial.html>

<https://www.nikolateslalegend.com/wiki/tesla/adams-power-plant-transformer-house>

The John Dean Adams Power Plant is the subject of a huge amount of disinformation across the Internet. It all is based on a false description of the property in a legal document, intended to make the remaining building a National Historic Site. This document and all documents referencing it state the the generators operated continuously in the Transformer House from 1895 to 1961. This is the topic of a companion article, a few summary points are listed below.

The generators were located in Power Houses #1 and #2, not the Transformer House. The Transformer House could never have contained generators, as it was not the hydro canal, had no source of water, was not of the “deep pit” design, and was not connected to the discharge tunnel.

As the name implied, the Transformer House contained the 10 transformers (5 Scott-T banks) that interfaced the 20 generators in the Power Houses to the transmission line to Buffalo.

Due to its distance above the falls and low efficiency, the facility was shut down in 1924, when the more efficient Schoellkopf 3-C came on line. The utility stated this fact in a 1937 court case, where the court ruled that Adams was to remain shut down. It also remained unstaffed thereafter. Anything that needed to be done at the facility, was performed by a truck-based “Traveling Operator,” one of whom was my father.

The hardware was scrapped sometime around 1940, leaving Power Houses #1 and #2 empty, until they were demolished in the 1964. The Transformer House was repurposed to house machines belonging to another company and operated by the Niagara Mohawk Power Company. The Transformer House was then purchased for \$3 million, for the purpose of a future museum. It was subsequently sold for a lesser amount and exists to this day as a warehouse.

Adams and most of the other old power plants generated 25 Hz electricity, which could not have been replaced by 60 Hz power from the new Robert Moses plant, which came on line in 1961. The only power plant to shut down in 1961 was Schoellkopf 3-A, which had been repaired after the 1956 disaster. John Birch Rankin Station in Canada generated 25 Hz power and remained in operation until 2006.



Center: Hydro canal serving Power Houses #1 and #2, but not Transformer House

Left, rear: Power House #2 (1905)

Center, front: Transformer House

Right: Power House #1 (1895)

Adams Power Plant, Street View



Note Power Houses #1 and Power House #2 on the sides of the hydro canal, with the Transformer House just beyond the end of the canal, circled in yellow.

Adams Power Plant, Transformer House Circled In Yellow

The Adams Power Plant was one of the three “deep pit” designs at Niagara Falls. The other two were Toronto Power and Rankin Station, both in Canada. Rankin was donated to the Niagara Parks Commission in-tack and is now a museum and the only remaining example of this design.

In the deep pit design, the generators are located at street level, the level of the upper Niagara River. The turbines, supplied through pipes called penstocks, are located at the bottom of the pit, 140 feet down in the case of the Adams Power Station. The turbine and generator were connected by a long vertical shaft. The entire weight of the rotating parts of the machine were supported by a single water-cooled thrust bearing, located on the “thrust deck” just below the generator. There were also collar or guide bearings to eliminate wobble of such a long shaft. Obviously, the deep pit design is impractical for larger generators with larger and heavier shafts.

Spent water from the turbines emptied into a chamber below the turbines and flowed into the lower Niagara River via long discharge tunnel. The tunnel served both Power Houses #1 and #2. It is the sacrifice of 80 feet of elevation for the slope of this tunnel that made Adams so inefficient. Today, the Adams tunnel is used to discharge effluent from the city's waste water treatment plant, built on the adjacent property. The tunnel and the odd green colored effluent are visible next between the foot of the Rainbow Bridge and Maid of the Mist boat dock.

Each of the two Power Houses contained 10 generators, a total of 20 generators, although one reference states that there was a total of 21 generators. They were rated at 5,000 Horsepower each and generated 2-phase electricity at 25 Hz and 2,200 Volts. At the time, 2-phase power was all that was understood in the U.S.. However, Charles Proteus Steinmetz pioneered 3-phase power in Europe and he and Tesla

decided on 3-phase transmission of power to Buffalo. The transition from 2-phase, 2,200 Volts to 3-phase, 11,000 Volts and, later, 22,000 Volts was performed by the 10 transformers in the Transformer House. They were configured as five Scott-T (https://en.wikipedia.org/wiki/Scott-T_transformer) banks, each capable handling the output of four generators. Interestingly, when the 3-phase power arrived as Buffalo, they didn't know what to do with it. So, they converted it back to 2-phase power.

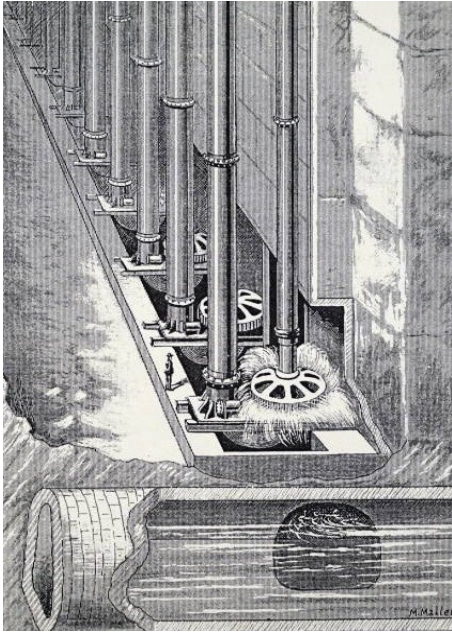
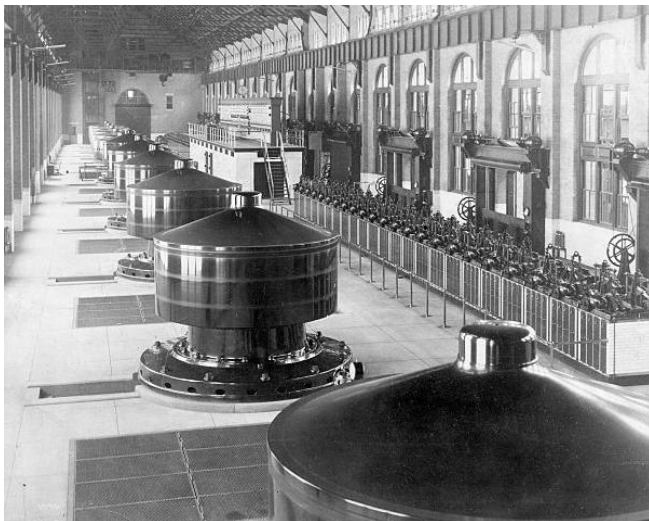


Diagram of the Deep Pit Design & Photo of the Thrust Bearing

The generators at Adams were of the “mushroom cap” design, where the inner windings were stationary and the outer field windings rotated. (One reference states that 16 of the 20 generators were of this design and the last for installed resembled standard motors, with a stationary outer winding.



Power House & Generators



Transformer House

With no hope of restarting the generators, as a result of the 1937 court decision, the hardware was scrapped, some time around 1940 or after WW-II. However, there is no documentation as to this date.

The two Power Houses remained empty until they were demolished in 1964. The Transformer House was spared and repurposed to contain two and later three “frequency changers” or “rotary converters,” owned by Union Carbide. (A casual viewer might easily think that these machines are generators, when they are not.) Today, the Transformer House is only building remaining, privately owned, and used as a warehouse for the Winter storage of boats and RVs.



Transformer House Interior & Frequency Changer

Whether or not the generators at Adams were ever reactivated after 1924 is a difficult question.

There are statements in the literature claiming that Adams was reactivated in 1941, in support of the WW-II effort. If this is the case, the scrapping of the equipment would be later than the 1940 date, mentioned above. This remains an open question, as it predates both my birth and my father's employment with the company as a generator operator. The reference claiming that Adams was reactivated in 1941 also states that it operated until 1961, which is definitely false.

There are conflicting statements in the literature as to whether Adams was reactivated after the collapse of the Schoellkopf Power Plant on June 7, 1956 and the loss of a major source of 25 Hz power. However, this was definitely not the case, according to my personal knowledge and the fact that no water was seen exiting the discharge tunnel. Adams was mentioned as a source of 25 Hz power after the collapse, but that source would have been the frequency changers in the Transformer House, rather than the generators.

Note: Both the Toronto Power and Ontario Power facilities in Canada were reactivated after the collapse of the Schoellkopf Power Plant. Toronto Power shut down for good in 1974 and Ontario Power shut down in 1997, as customers were transitioned to the 60 Hz grid.

All that remains of the Adams Power Plant today is a short section of the hydro canal and the empty Transformer House, now used for winter storage of boats and RVs. The decorative arch that existed at the facility has been relocated to Goat Island State Park, near a statue of Nicola Tesla