

HISTELEC NEWS SUPPLEMENT - APPENDIX 2

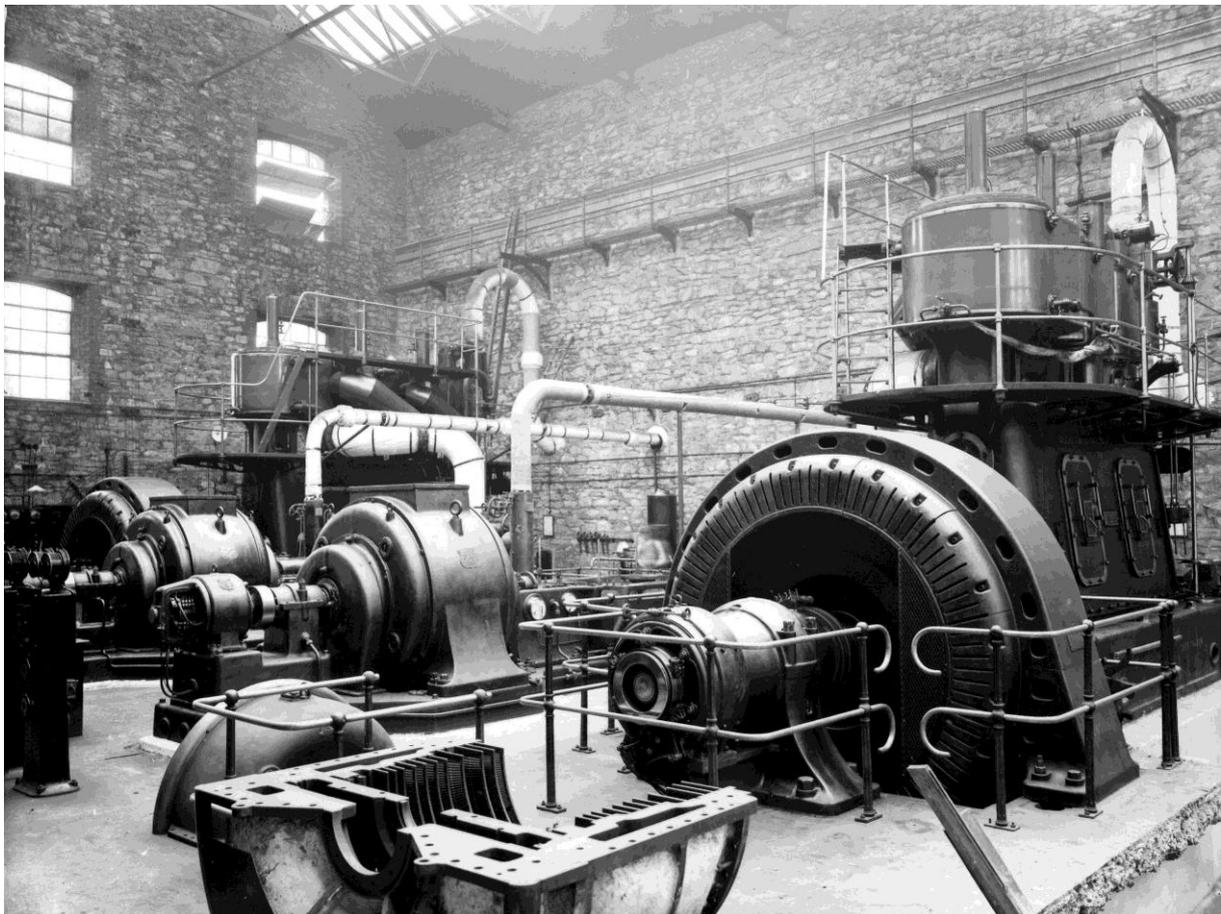
HAYLE GENERATING STATION

On 13.3.10 CEPCo signed an Agreement with Harvey & Co for the erection of works, etc., on a plot on the south-west side of Hayle Towans, alongside the Hayle River, subject to a Lease when completed. The lease was signed on 13.3.15 and covered the land & rights of way; laying of cables & pipes; obtaining water; railway sidings; the coal conveyor; payment of 6d/ton on all coal landed across the quay and that all coal-handling be done by Harvey & Co workmen. The site to be returned to its original state, when vacated (8W553381). The contract for Stage 1 buildings was given to Carkeeks of Redruth. They started on 7.5.10 and completed it on 12.12.10 thirty weeks later. All alternators installed between 1910 and 1929 were 25 cycles. Mr.T.H.Edwards was the first Resident Engineer. Generation was started in December 1910 with No.1 Set, the Reyrolle 10kV switchboard and the Hayle-Carn Brea dual 10kV line in service.

- 1910 No.1 Set. 900kW Belliss & Morcom No.4467 vertical triple expansion; 21inch 29inch & 48inch x 21inch 160psi, 250rpm Dick Kerr alternator, Two Babcock & Wilcox Boilers each 20,000 lbs/hour.
- 1911 No.2 Set. 500kW Belliss & Morcom mixed pressure turbine. Either steamed alone at 160psi, or as combination set taking condensate from No.1 at 10psi, Lancashire Dynamo alternator.
- 1912 No.4 Set. 900kW Belliss & Morcom. No.4859. Same as No.1 Set. Two Babcock & Wilcox Boilers, each 10,000 lbs/hour
- 1913 No.3 Set. 500kW Belliss & Morcom mixed pressure turbine, Same as No.2 Set Two Babcock & Wilcox Boilers. each 12,000lbs/hour
- 1914 No.5 Set. 3000kW Richardson & Westgarth Turbo-alternator, 180psi 1500rpm.
Two Babcock & Wilcox Boilers, each 14,000lbs/hour.
The terminal pole of the 10kV river crossing was moved to the west of the Engine-room to permit this extension.
- 1916 No.6 Set. 3000kW Richardson & Westgarth Turbo-alternator, Same as No. 5 Set..
- 1928 7500kW BTH Turbo-alternator, 25 cycle. Two Babcock & Wilcox Boilers 50,000lbs/hour., BTH 10kV Switchboard. This plant was the first in the Station to operate at 250 lbs/sq in. It was originally coupled to the old 180lbs/sq.in. plant through pressure reducing equipment.
- 1929 One Babcock & Wilcox Pulverised Fuel Boiler, 50,000lbs/hour, Parsons 500kW Turbo-alternator moved from Carn Brea to Hayle, but it never ran satisfactorily and was removed before 1935.
- 1930 Control Room established - combined generation & system control.
- 1932 Sterling Boiler, 100,000lbs/hour.10,000kW English Electric Turbo-alternator, 50 cycle. There was not enough 50 cycle load in Cornwall to test this set, Three insulated troughs were setup as a water resistance, The tests were satisfactory and the set was accepted from the makers.
- 1933 Hayle Power Station was connected to the Grid. Power could now be imported or exported, since the connection to the BSP being two cables on the new English Electric type OLF switchboard with double bus-bars. The 10,000kW set was also connected to the new board, as was the output from two 2,500kVA Frequency Changers, which were temporarily connected to the Reyrolle board. The Change of Frequency of all consumers was then carried out, using the dual lines after one side had been diverted to the new switch-board. The 7,500kW BTH set was then changed to 50 cycles and also diverted to the new board. The BTH board was kept and eventually installed in the temporary Grenville 33/11kV S/S. The whole cost of this work was borne by CEB. Hayle started to export to the Grid and was designated a Selected Station.
- 1935 English Electric 300kw Turbo-alternator installed, primarily for pumping circulating water for the condensers should the station shut down and was controlled from the Control Room.
- 1936 All 25 cycle generators. Nos.1 to 6. were offered for sale as scrap, subject to mutilation, with eight Babcock & Wilcox boilers; the Reyrolle board, fourteen assorted motors and thirteen transformer windings. The tanks of the latter were kept for transformer oil storage at Carn Brea, 50 cycle capacity 17,500kW.
- 1938 I.C.I. built and managed the British Ethyl Works close to the gate, to extract bromine from seawater. This was required as all anti-knock agent in petrol and hitherto only available from Germany. A supply at 11kV was connected and also pipes to supply process steam. The seawater had to be hot, so the condenser cooling water outlet was diverted into these works. To obtain maximum output from I.C.I. the station was run out of merit throughout night periods at just over half load to raise the temperature of the seawater, which they took at the rate of two million gallons/hour. (Associated Octol took over 1.1.48). Heavy snow fell all over England early in December and Hayle was required for the first time to provide maximum generation.

- 1939 One Stirling Boiler, 100,000lbs/hour, one English Electric 15,000kw Turbo-alternator. At maximum load on tides exceeding 16ft, there was little flow in the Hayle River for some 2 1/4 hours, The water in the pool around the intake pipe passed through the condensers approximately three times, reaching 78⁰F, before cold water came in with the next tide. The eventual capacity was likely to be 70,000kW so additional storage for at least 3,000,000 gallons/hour of cooling water was required. A dam was built in Carnsew Pool to impound water and 100,000 cubic yards of sand was dredged out to increase the capacity. Here, in April 1939, a shaft was sunk 110ft down. A 7inch diameter tunnel was then driven under the river to a similar shaft, with pumps beside the power station. This work was completed in July 1941, giving the station two sources of cooling water. The Engineer in charge was Mr.B.O.Rees.
- 1947 Two Stirling Boilers, each 100,000lbs/hour, one English Electric 15,000kW Turbo-alternator. This was the first of the H.P plant, running at 425psi, 33kV Air-blast Switchgear installed for Alternator transformers 11/33kV, and all outgoing 33kv lines. A new Control Room was set up in the same building.
- 1949 One Yarrow Boiler 200,000lbs/hour, one English Electric 20,000kw Turbo-alternator,
- 1959 One Yarrow Boiler, 200,000lbs/hour, one BTH 20,000kw Turbo-alternator.
- 1971 Distribution Control Room moved to Pool in the original Carn Brea Boiler House.
- 1972 All plant installed from 1928 to 1932 taken out of service.
- 1973 Associated Octol closed in September and ceased to take the hot cooling water. The station gradually slipped down the Merit Table, as by now a number of large modern power stations were taking the base load, and it was seldom called upon to generate. The station was eventually closed and all the plant was removed. The BSP, of course, remained, and SWEB took over the switch-houses as a number of the 33kV & 11kV switches were part of the distribution system.

The office furniture and other moveable items were offered for sale by auction on 12th April 1977. In June 1981 the two stacks were felled and in the following December the Turbine house and the Boiler House were demolished. The ground was then cleared, in accordance with the original Agreement. The last Station Superintendent was Mr. R.G. Sandercock.



Machine Set No.4 - 900kW & No.3 – 500kW Machine Set Turbine nearing completion 1912-13