

Hunterston Nuclear Power Station, Ayrshire

Corrosion Management System to the Cooling Water Intake Jetty and Headworks 'B'

Year of Installation: 1997 and 2012

Anode Used: MMO titanium anode mesh, ribbon and cementitious overlay at Headworks 'B' and Vector XP4 galvanic anodes on the access jetty.

Monitoring Used: C-Probe CP10P and CP101

Management System: AchillesICP and AchillesGCP

Additional Treatments: Sacrificial anodes below water, early detection at intermediate deck level.

Description:

The Cooling Water (CW) Intake Access Structure (Jetty) was constructed in 1959 for Hunterston A Nuclear Power Station.

The Jetty was extended in 1976 with the addition of the 'B' Station Headworks.

Following years of continuous concrete repair to the soffit, cantilever beams and deck of the Headworks 'B', the client (British Energy) took the step in 1996 to address the problem of environmentally driven incipient anode formation through the use of impressed current cathodic protection (ICCP).



The jetty is exposed to extreme marine conditions and therefore required a durable protection system to ensure long life. To this end a mixed metal oxide (MMO) titanium anode mesh and cementitious overlay was installed to all concrete surfaces underneath the jetty including the intake shaft as well as above deck. MMO titanium ribbon was slotted into the columns. Below the water line zinc sacrificial anodes were installed.

The ICCP system installed in 1997 comprised 8 power, control and monitoring zones for independent control of the deck, intake shaft, cantilevers and columns. These zones are monitored using C-Probe reference electrodes and probes with the capacity to expand the monitoring to include corrosion rate measurements in the future. The intermediate deck level was not installed with any ICCP and has monitoring in place on assess ongoing condition as early detection of problems.

Recent inspections of the jetty concluded that high chloride levels in the concrete from the marine environment had resulted in severe degradation and the Jetty was reaching the end of its useful life.

The 2012 project involved a programme of work to repair and refurbish the jetty structure with the purpose of extending the life of the Jetty to 2024.

This phase of the work involved concrete repairs to the soffit, longitudinal beams and crossheads on the jetty arm. A Galvanic Corrosion Protection (GCP) system and a 6 zone corrosion monitoring system have been installed to ensure that incipient corrosion within the access jetty is controlled.

Work also extended to kerb up stand repairs, handrail repairs, lighting repairs and the installation of a protective top coating.