



## Evaporator D

# Progress report

The construction of this Highly Active (HA) liquid evaporator at Sellafield will provide additional capacity to support the site's existing evaporators, which will play a pivotal role in the delivery of reprocessing, historic clean-up and high hazard reduction across the Sellafield site. The project is an alliance of Sellafield Ltd and Costain employees.

### Challenges

The project has faced a number of challenges ranging from preparing a justification of the need for a new facility, and the development of a construction methodology to minimising risk to personnel and existing buildings.

### Solution

The strategy is for off-site fabrication of large-scale modules which are then transported to site by sea and installed into the building's concrete shell using a gantry system. This is the first time in the history of the Sellafield site that large-scale modular construction has been used.

## Key accomplishments since January 2011

## Evaporator D - Progress report

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Completion of the main cell walls and the removal of the Doka climbing formwork system.

Over 100 construction workers from Bowercross and 25 staff have worked night and day to fix over 900 tonnes of reinforcement, 5000 cubic metres of concrete and 1500 cast in items.

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Successful delivery of the Gantry components.

There were approximately 40 vehicle loads delivered then stored pending gantry erection. To minimise the erection time at the Evaporator D site a number of components were pre-assembled.

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Significant milestone achieved with the completion of the second phase of construction. Celebrated by holding a traditional 'topping out' ceremony on top of one of the 26 metre-high reinforced concrete roofs that will form the civil structure for the facility.

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In order to safely deliver the modules by sea to the Sellafield site, a temporary development has been constructed adjacent to the Sellafield rail station.

The development provides a steady incline between the beach and railway level crossing by the construction of a ramp across a section of the Sellafield beach, the cutting of a section from the Ehen Spit, and the erection of a bridge across the River Ehen.

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In addition to the offsite works, significant onsite works have taken place in order to move the modules to the Evaporator D site.

A number of modifications have been required to the Sellafield site infrastructure. The most notable of these is the temporary removal of sections of the Thorp Link Bridge to provide enough height on the road to move the modules. Over 300 panels were removed ranging from 0.9m to 1.8m high and 1.2m wide.

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ME&I fabrication and component installation continuing.

Up to 26m North released to ME&I plus all areas up to 17m are released for ME&I construction works.



Continued fabrication of the Evaporator vessel, Feedstock tank and Distillate vessel at Bendalls in Carlisle and Isleburn in Dunfmline.

Fabrication of other components, vessels, pipework and steelwork at various suppliers throughout the U.K.



Completion for delivery of the first two modules was achieved.

Installation of pipework, the electrical, instrumentation and ventilation installation was completed.



A and B Substations and two Essential Power Distribution (EPD) switchboards shipped to the Module Vendor.

The assemblies are currently undergoing various acceptance tests. The completed modules will be ready for delivery to site early in Sept '11



Installation of the gantry system. The gantry is a structural steel lifting frame immediately adjacent to Evaporator D building. Its purpose is to lift and slide pre-fabricated process modules of up to 500 Te in mass into the pre built reinforced concrete structure of the building.

## Successful Marine delivery

The first two of the planned eleven massive modules required for the Evaporator D facility were successfully transported to Sellafield site.

The modules, weighing in at over 100 Te, measure 10m high, 7.5m wide and almost 10m in length, were loaded onto the barge at Ellesmere Port prior to sailing the 90 miles north to the beach adjacent to the Sellafield site.

The modules were conveyed to the Sellafield beach, off loaded from the barge and successfully driven onto site.





Installation of the first two modules was completed ahead of the baseline plan, releasing significant additional civils and ME&I workfaces.

Clearance between the modules and the cell walls was particularly tight and careful setting out of the equipment was assisted by the site survey team. Operatives observed all manoeuvres closely from vantage points on the lift and skid tables or concrete structure.



External Site Services. Construction of the modular pipebridge is taking place at West Cumberland Engineering and the first 5 sections are nearing completion.

In addition the foundations for the cooling tower and substations have already been completed. All piling has been completed and the pile caps to enable installation of the first 5 P/Bridge PAUs have been cast.



The building was made weathertight in August which was a vitally important achievement and marks a turning point in the project.

This achievement will enable the remainder of the building works to be completed between the 26m and 38m levels. It also releases a large area for installation of the pipe support structure and HVAC / E and I containment.

Evaporator D - Phases of Work	2010	2011	2012	2013	2014
Main Building Civil & Superstructure Construction	[Bar]				
Main Building ME&I Installation		[Bar]			
Module Delivery & Installation		[Bar]			
External Services Civil & ME&I Installation	[Bar]				
B215 Interfaces		[Bar]			
Inactive Commissioning		[Bar]			
Inactive Safety Commissioning				[Bar]	