



M430: FABRICATION AND TRANSPORTATION OF HINKLEY POINT C OLAF AND ILAF STRUCTURES

Balfour Beatty



OVERVIEW

Caley Ocean Systems were awarded a contract to manufacture, supply and transport 8 large scale frames for Balfour Beatty's Hinkley Point C project. Caley contracted Malin Abram and Malin Newbuild to support the manufacture and delivery of the large structures. The three companies formed The Clyde Alliance, a progressive partnership based on the River Clyde in Glasgow. Hinkley Point is an English nuclear power site built on the North coast of Somerset, 30 km to the South of Cardiff and 40 km to the South-West of Bristol. It is located on the bank of the Bristol Channel at the outlet of the two estuaries, of the River Severn and the River Parrett.

The planned construction of a new nuclear power station at Hinkley Point will incorporate two 1,650 MW EPRTM nuclear reactors, together capable of generating electricity for approximately 5 million homes and a range of shared facilities.

The complex scope consisted of 8 handling alignment frames, with 3 different variations of frame required. There were 2 OLAF frames (outfall lifting and alignment frame), 4 ILAF frames (intake lifting and alignment frame) and 2 guide frames. In total, this amounted to a cargo of over 1,000 Te, as detailed further below.



THE CARGO

- OLAF frame - 117Te each
- ILAF frame - 115Te each
- Guide frame - 64Te each
- Access platforms - 2Te - 17Te
- Seafastening - 11Te - 38Te
- Total weight - 1,116Te

CONTRACT RECORD M430

THE FABRICATION

All 8 of the main frame structures were primarily fabricated from steel pipe and plate, with each element of the structure split into special, primary, and secondary categories which determine what grade of steel should be used on the structure (special S690 & X70, primary S355, secondary S275). In addition, each structure was individually customised to enable it to be fitted to a specific set of cast in concrete lifting lugs on site.

As well as the frames themselves, The Clyde Alliance were also contracted to supply several access platforms and seafastening frames, with the former mounted on top of the frames and the latter used to secure the structure to a barge for transportation to Avonmouth. This transportation exercise was planned and successfully executed by Malin Abram, The Alliance's specialist heavy lift business unit.

All structures were built to DNV standard DNVGL-OS-C401 and were verified by an onsite inspector. In order to complete the build to this standard, 10 new weld procedures were created which all comply with C401. These weld procedures allow the team to weld plate – plate, pipe – pipe and plate to pipe and range from a material thickness of 5mm – 120mm.

THE CLIENT

Balfour Beatty are to deliver one of the most complex marine engineering projects currently taking place worldwide, to support the construction of the first new nuclear power station built in the UK in more than 20 years. The project will see the construction of 3 tunnels under the seabed that will supply the 2 reactors at Hinkley Point C with cooling water and then discharge it back into the Bristol Channel.

The Clyde Alliance were proud to play a part in this important, iconic project.



TRANSPORTATION

Malin Abram transported the structures from our fabrication yard in Renfrew to the client's base in Avonmouth. This scope spanned a variety of distinct stages – the load out, the securing, the transport, and the arrival at Avonmouth.

The load out was carried out via Self Propelled Modular Trailers (SPMTs) on a tidal berth; this presented its own set of challenges with our engineers on site leading the operation and ensuring that the load out was performed safely and according to their calculations.

The seafastening for the structures had to meet not only the structural designer's guidelines but also DNV guidelines for marine transportation.

Turning to transport, this involved finding and chartering a suitable tug and barge for the job – local conditions meant that the barge and tug had to be a certain size; only tugs with shallow draughts could take the barge to and from the quayside on the River Clyde. Furthermore, it meant that a local bridge had to be raised to allow safe passage, all of which required great teamwork and extensive planning.

Given the time of year, the voyage from Renfrew to Avonmouth was anything but simple. The tow was weather restricted which meant a suitable window was needed prior to departure. This required detailed planning and co-ordination across all parties involved, including the client and the many sub-contractors.

On arrival at Avonmouth, Malin Abram liaised with relevant parties to ensure a smooth operation. They were involved in all operations involving tug and barge movements within the port; including arrival, departure, and numerous turns due to the need to be "end-on" to load in the structures to the quayside. The end-on requirement for load in, restricted movement of other vessels in the dock, which added further complexity and necessitated the turns.

CONCLUSION

Despite complications in supply chains through the pandemic, The Clyde Alliance successfully completed this project in the tight timescale of 11 months and although the scope of works doubled from contract award, the team worked very closely with the client and DNV to ensure all structures were safely delivered on time and to specification to the site in Avonmouth.

