



VLT® control keeps SS Great Britain shipshape and Bristol fashion

Beneath the water surface - separated by a glass plate - moisture is removed from using a specially designed air-handling unit operated 24 hours per day, 7 days per week by VLT® 6000.

When she was launched in 1843, Brunel's SS Great Britain was the world's largest, screw propelled, wrought iron steamship. Built in the Great Western Dockyard in Bristol, she had a distinguished history as the world's first ocean liner, carrying emigrants to Australia and as a troop ship during the Crimean War but an ignominious end as a storage hulk in the Falkland Islands.

Now she is home again in Bristol and nearing the completion of an £11.3 m restoration supported by the Heritage Lottery Fund. Visitors to the ship, from July will have full access to all parts of

the ship, as no passenger of her heyday could, and will be able to see her in all her Victorian splendour.

Dry beneath water level

A major aspect of that work is to stabilise the wrought iron hull and protect it from the ravages of further corrosion. The most innovative part of that work consists of constructing a sealed glass plate around the waterline of the ship to form a giant airtight chamber surrounding the ship's lower hull.

The glass plate will be covered with a 50mm layer of water, so that the ship appears to be floating at anchor.

Beneath the glass plate, moisture will be removed from the air using a specially designed air-handling unit operating 24 hours per day, 7 days per week. It consists of two sections, a process section within which air will be passed through desiccant in a hygroscopic wheel to remove excess moisture and take the humidity within the dock down to RH 20% - about



Dehumidification ducts being installed aboard the restored SS Great Britain.



A water covered glass plate will create the illusion that the SS Great Britain is afloat

the same as the Arizona desert. Within the regeneration section, direct fired gas heaters dry the desiccant after which the air is passed via the heat recovery system to the exhaust port.

A similar but larger unit will be installed within the ship's boiler room to control the ship's internal temperature and humidity and thus protect the hull both externally and internally from corrosion.

15 kW VLT® 6000

The temperature and humidity control system is being provided by Tour Andover Controls, South West division. They specified a 15 kW VLT® 6000 drive to power the process supply fan for the enclosed dock, controlling volume between 5.7 m³/sec and 1.7 m³/sec, facilitating energy efficiency when ambient humidity is low. The larger system within the ship will utilise a 55 kW drive to provide up to 13 m³/sec of controlled air circulation.

Control is exercised via wireless temperature and humidity sensors, 3 along each side of the ship and 16 inside her.

Every 30 seconds, readings are transmitted to the receiver in the ship's plant room and relayed to the Ship's Management System via the Ethernet communications system. PID control averages out the humidity reading and controls the dryer burner rate.

Fan speed is linked to the burner rate and the fans are run at full speed when the regeneration burner rate exceeds 20 % output. When the ship and museum are closed and output to the regeneration burner drops below 20 %, the fan operates at its preset low speed.

The circulating air temperature is controlled by an indirect gas fired heater battery and a water cooled chiller battery in the air path to maintain temperature between 160° C and 230° C. Should the cooling requirement exceed 15 % at times when the visitor centre is open, then fan speed is increased to maximum to achieve a more rapid return to the preferred control zone.