Marine Technical Limits

DEHUMIDIFICATION

DEHUMIDIFICATION OF SLOPS TANKS FOR COATING RENEWAL

Development of bespoke dehumidification system to allow on-station repair.

VESSEL

Sendje Ceiba

OPERATOR

Hess Equatorial Guinea

PROJECT MANAGEMENT

MTL

OBJECTIVE:

To blast and reinstate a full coating system within a slops tank, that shall remain effective for a minimum of 10 years.

CHALLENGE:

With limited power supply reduce relative humidity by 40% in a tank of 5370m³ to allow abrasive blasting and cleaning. Improve working conditions and reduce heat stress.

OUTCOME:

MTL collaborated with Munters to design a high capacity dehumidifier that could operate within a zone 1 hazardous area. Blasting and coating were successfully completed and a safe working environment maintained.

- Simplified high capacity dehumidifier
- Air/air heat exchanger
- Used existing ship steam supplies
- Could operate in a zone 1 hazardous area

As part of their on-going support of structural integrity management and repair on the Sendje Ceiba, MTL were tasked with finding a solution to create suitable environmental conditions in which to perform the coating renewal of a slops tank.

To enable successful execution of coating renewal the relative humidity needs to be maintained at <60%. The ambient conditions within the slops tank were 80-100% relative humidity and 28 – 30 deg C.

A number of other constraints also had to be considered and made the task particularly challenging. The flow of fresh air into the tank had to be maintained within a confined space. The available electrical supply was limited. The equipment was to be located in a zone 1 hazardous area. In addition to this the equipment needed to be simple so that maintenance could be carried out by onboard crew. Finally, the temperature inside the tank was also critical, for worker safety it must not exceed 35 deg C.

Part of the dehumidification system prior to offshore mobilisation

"Identify expertise and co-ordinate design development"

With no off-the-shelf solution available, the challenge fell to MTL to plan and develop the solution. After a period of intensive research, MTL pinpointed Munters, a Swedish based producer of humidity and climate control systems, as best placed to aid development of a suitable dehumidification system.

MTL engineers visited the Munters workshop and were able to explain the constraints on board the FPSO. This direct contact enabled efficient development of a prototype dehumidification system and MTL could confirm at an early stage that it would fulfil all the requirements.

"Another bespoke design added to the MTL library of FPSO technical solutions"

The resulting system was a unique, simplified high capacity dehumidifier, which required no electrical power. The drums were powered by 2 small air motors and regeneration heat was generated from the ship's existing steam supply. The dehumidified air was then cooled to 32 deg C, using a stream of air from the VPS (Ventilation and Power Skid), without allowing the flows of air to mix. With two

dehumidification trains operational in the tank, a total of 5m³ of dehumidified air could be pumped into the tank every second.

BENEFITS

What really makes this system such a successful development is the combination of how effective it is and how well it satisfies the safety demands of working in a zone 1 hazardous area.

"Hazardous area working – made safer"

All of the equipment used in the design is non-sparking and no electrical power is required. If it were to use electrical power, new

switchgear and power supplies would have to be installed to cope with the load, and the heaters and associated controls would need to be explosion proof.

"Hostile environmental conditions controlled to allow quality repairs"

During development, the close collaboration between MTL and Munters ensured that the design took account of the constraints on board the FPSO, and made full use of the available resources. The resulting dehumidification system was not only very safe but extremely efficient. It achieved tank conditions of 50 – 60% rH and 32 deg C – capable of holding blast for several days. This enabled maximum efficiency on the job without compromising the quality of the repair.

At MTL, the development of new technical solutions and systems of work is founded upon a desire to deliver the best solution for our client. To find out more about how MTL approach the technical challenges posed by FPSOs and the tailored solutions we could offer your company, please visit our website www.technical-limits.com

Alternatively, call or email us to request further information. Please see below for details.

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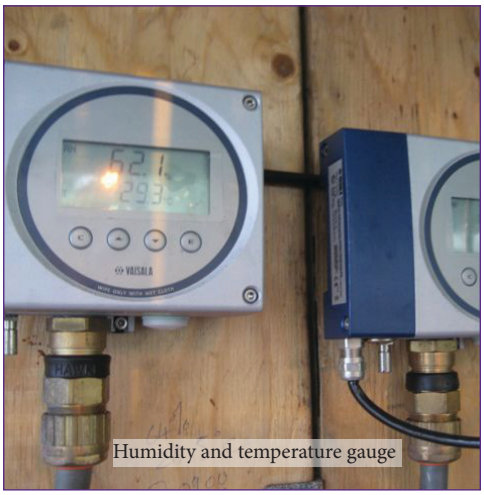

Humidity and temperature gauge