

thyssenkrupp Uhde extends the life of ammonia tank

thyssenkrupp Uhde has reached the halfway mark in the inspection and refurbishment of an ammonia tank located at Richards Bay's back-of-port facilities in South Africa's KwaZulu-Natal Province.

thyssenkrupp Uhde designed and built two 19034 m³ anhydrous ammonia storage tanks for a key customer in Richards Bay back in 1982.

Ammonia (NH₃) is an inorganic compound of nitrogen and hydrogen. Ammonia gas is colourless and can either be easily compressed or cooled down to sub-zero temperatures to form a clear liquid.

Liquid ammonia is stored in low pressure cryogenic tanks at harbour import facilities for distribution to various industries around the country. Ammonia is used in a host of applications that include the manufacturing of pesticides, fertilizers, plastics, textiles, dyes and other chemicals. Ammonia is also used as a refrigerant gas and to purify water supplies.

Due to the highly corrosive properties of liquid ammonia, and to protect people and the environment, it is statutory to take storage tanks out of commission every 20 years to allow for internal and external inspection. "By inspecting the integrity of the structure, we can identify possible weak areas and carry out all the necessary refurbishments. This helps to prevent potential ruptures and subsequent leakage, extend the tank service life and, importantly, also allows for continuous safe operation of the facility," says Yurisha Singh, HOD Sales & Proposals, at thyssenkrupp Uhde.

thyssenkrupp Uhde was awarded the ammonia tank revamp project in October 2022. "As the prime contractor, we deploy a full construction management team, including safety management, to site," explains Singh. "We appoint sub-contractors to attend to the necessary construction work." She says the thyssenkrupp Uhde site team is well-known to the customer as it was already in Richards Bay, having just completed a project. "So, the thyssenkrupp Uhde team and contractors simply 'rolled over' from their previous project to commence immediately with the necessary preparatory work required for the tank inspection and refurbishment process."

Before any inspection can commence, the tank's interior environment must be made safe. This involves draining all the ammonia liquid, which is followed by purging of any residual gases from the tank using a non-reactive gas such as nitrogen. Once the space is cleared from ammonia it is further vented with natural ambient air. Only then is it safe for a skilled thyssenkrupp Uhde technician to enter the tank without the need for a breathing apparatus to commence with the inspec-



thyssenkrupp Uhde is inspecting & refurbishing a 20-year-old ammonia storage tank for increased lifespan and continuous safe operation.

tion procedures.

More than 1822 Non-Destructive Tests (NDTs) are performed to detect any potential faults. As the tank is manufactured from cold duty carbon steel, a Magnetic Test (MT), which is designed for only this type of material, is conducted. "For stainless steel tanks we would carry out Penetrant Tests (PT)," notes Singh.

Further tests conducted on the ammonia tank during the inspection process include a material thickness test as well as a Radiographic Test (RT). "We also conduct ultrasonic tests on all the weld joints to determine whether the quality is within parameters. Any problem areas are then flagged for re-welding."

Once all the revamp work has been completed, the thyssenkrupp Uhde team conducts further NDTs to ensure that the tank is compliant with all necessary standards.

thyssenkrupp Uhde directs its innovation prowess towards construction methods, optimising schedules and costs, as well as mitigating worker safety risks and weather hazards. Although this is not a genuine 'green' project, Singh confirms that some of the identified revamp scope will help to reduce environmental impact. "For example, improved insulation will help to cut down on energy loss."

Full refurbishment of the ammonia tank will be completed by thyssenkrupp Uhde.

Commissioning will take place under the direction of experts who have been especially assigned to the project, in collaboration with operations staff from the customer. Project commissioning and expected completion date is scheduled for June 2023.

thyssenkrupp Uhde's professional inspection and value-adding refurbishment capabilities are supported by project management, procurement and engineering specialists who are based at the company's head office in Rivonia, Gauteng.

"Our ability to draw from a global competency pool coupled with decades of local knowledge and experience, enable us to deliver turnkey plant and project solutions to our customers across Sub-Saharan Africa," concludes Singh.

About the company

The local subsidiary of thyssenkrupp Uhde, was established in South Africa in 1959. It is a leading partner in the engineering, construction and service of industrial plants and systems. The company's solutions encompass the entire range of services for Fertilizers, Petrochemical, Oil & Gas, and others. Its experience spans 100 years and over six decades in Africa with an impressive reference list that extends throughout sub-Saharan Africa.

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