3,520 t/d. Both the reactor and CO_2 stripper are the largest so far built and all the major synthesis equipment in the plant is made from *Safurex®*, a unique duplex stainless steel material which up to now has cut oxygen levels in the plant from 0.3% to just 0.1%, right on track of eliminating oxygen entirely. This innovation has not only improved synthesis but has also lowered ammonia emissions and cut energy consumption. In a first for China, the plant uses RADAR instruments in the stripper and reactor levels for level control.

Stamicarbon's urea revamp references cover more than 80 projects throughout the world. At the PIC, Kuwait ammonia and urea complex, the original 550 t/d total recycle conventional urea plant was debottlenecked to 1,750 t/d using *Urea2000Plus* technology, featuring a Pool Condenser. On behalf of Mangalore Chemicals and Fertilisers, India, the original 1,030 t/d conventional urea plant was debottlenecked via the installation of a medium pressure scrubber to boost capacity to 1,290 t/d. Closer to home in the Netherlands, DSM upgraded the original 1,100 t/d *Urea2000Plus* installation with MEGA technology, raising capacity to 1,500 t/d.

NIIK spreads its wings

JSC NIIK (Research and Design Institute of Urea and Organic Synthesis Products) was founded in the Soviet Union as 1952 as the Dzerzhinsk Branch of the State Institute of Nitrogen Industry. Today, NIIK enjoys a global reputation as the supplier of modern technology for the production of urea and other processing technology. NIIK has invested considerable expertise in developing enhanced urea prilling and granulation technologies, which are now being retrofitted to plants around the world. The Scientific Department of NIIK has developed several revamping concepts, including the *URECON-2007™* process, which provides a new stripping process in AK-80 production units, and the *Urecon-2006™* process, based on the total liquid recycle system.

These technologies employ state-of-the-art equipment with optimised hydro-dynamics and high efficiency heat and mass exchange, including a stripper-distiller, a recuperative heat exchanger, a two-stage distiller, mixer and synthesis reactor. NIIK has designed prilling towers which incorporate an injection type air cleaning device and an embedded granule cooling unit in a fluidised bed, together with a high-speed granulating drum (HGD).

NIIK's most recent revamp project is in the final stages of completion. This is being undertaken on behalf of JSC NAK Azot and will use a unit relocated from a plant in Serbia. The opportunity will be taken to raise capacity from 1,000 t/d to 1,150 t/d as well as incorporating energy-saving equipment and automated process control systems. Gas emissions will also be curbed as will the waste water purification section. Construction of the relocated urea plant will be completed in the second quarter of 2010.

JSC Acron has also turned to NIIK to build a new 1,000 t/d urea plant based on a second-hand facility, in this case relocated from Italy. NIIK will modernise the urea unit to meet the latest environmental standards, incorporating new bundles and integrated additional equipment. As this issue went press, NIIK reported that it had signed a contract with JSC Salavatnefteorgsintez to upgrade the No. 24 urea plant. ■

Our technology has been recognized around the world for dry granulation of **MOP / SOP** and **NPKs**. Our services cover pilot plant tests, basic engineering, equipment supply, start-up supervision and commissioning. Typical flake capacities are in the range of 10-130 t/h.

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