

RWE Power AG, one of the leading suppliers of renewable energy across the globe, operates sewage sludge handling plants from various manufacturers at several sites as part of its Refinement business area. RWE once again selected a Putzmeister solution for expanding the plant in the Goldenberg power station.

Prerequisites

- Sewage sludge is delivered by trucks and tipped into two large reception halls, where a wheel loader takes over and distributes the sludge across the entire hall. This wheel loader also supplies the pump system's reception bunker.
- Lines 2 and 3 are designed for 40 t/h each in normal operation. However, each line can achieve outputs of up to 55 t/h.
- The delivery pressure in normal operation is 40–50 bar.
- The delivered sewage sludge is exclusively municipal sewage sludge from sewage treatment plants, primarily from North Rhine-Westphalia.
- The dry substance content of the sewage sludge can be up to 37%.

Design

The sewage sludge reception area is equipped with one reception bunker each. The LCB design of the KOS 2180 high-density solids pump allows the plant to take up very little space. The sewage sludge is pumped into the boiler house through a DN 200 delivery line, overcoming a height difference of around 150 m. At the incinerator, the sewage sludge is metered by two HMC-S check valves.

Details

- Sewage sludge with a dry substance content of up to 37%
- Capacity in normal operation: 40 t/h, up to 55 t/h possible
- Delivery pressure in normal operation: 40–50 bar

S-transfer tube pump system during sewage sludge handling at the Goldenberg site of RWE Power AG



KOS 2180 LCB high-density solids pump next to a 40 m³ reception bunker

Machines / equipment

2 x 40 m³ reception bunkers	2 x SEP 355 control cabinets
2 x PDSL 5535 sliding frames	2 x foreign body separators FKA 200
2 x SHS 3552 SH LCB bunker discharge screw conveyors	2 x boundary layer lubricant injection stations with 6 x DN 200 boundary layer lubricant injection nozzles
2 x KOS 2180 LCB high-density solids pumps	4 x HMC-S 180 check valves
2 x HMC-S 180 check valves	2 x SEP 15 control cabinets (check valves)
2 x HA L 355 hydraulic power packs	2 x HA 15 CE hydraulic power packs (for check valves)

Special features of the plant

Using water as a boundary layer lubricant

- Water can be added into the dual-shaft silo discharge screw conveyor (SHS) as required in order to operate the pump system at the most economic level. The dry substance content of the received sludge can vary significantly, leading to different pressure losses during pumping. By adding boundary layer lubricant, the operating company can adjust the pump system to the optimum setting as required in order to economically convey even difficult types of sludge.

LCB pump design (loading from below)

- The LCB version of the high-density solids pump gives the plant a lower installation height. With the LCB version, the dual-shaft screw conveyor loads the pump from below instead of above (as would be the case for the standard version HCB). This allows for savings in terms of both space and cost, as buildings do not need to be constructed as high. This design also offers a major advantage for areas with a high ground-water level.

40 m³ reception bunker with discharge auger, high-density solids pump and foreign body separator



FKA 200 foreign body separator

- Another significant benefit of the LCB version is the improved access to the wear parts of the high-density solids pump. The hopper can be freely accessed from above without having to disassemble the delivery line or other system components.



What makes the Putzmeister system so special?

S-transfer tube technology of KOS high-density solids pumps:

- Designed for continuous operation.
- Material transport in a closed system.
- High tolerance for foreign bodies. These are commonly found in sewage sludge, especially when delivered by third parties.

Foreign body separator:

- Integrated in the delivery line downstream of the S-transfer tube pump.
- Easy handling and operation.
- Protects the plant from secondary damage and increased wear.
- Reduces unexpected residues in the ash.



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