CASE STUDY: Dewatering Centrifuge CS26-4

Just the Facts:

Why New York City Chose Centrisys

Rigorous analysis showed a clear winner for one of the largest dewatering upgrade projects in the country

The Wards Island Wastewater Treatment Plant is the second largest of the 14 wastewater treatment facilities in New York City, serving about 1 million people with an average dry-weather flow capacity of 275 MGD.

As part of a series of upgrades to improve pollution control and treatment efficiency, the NYC Department of Environmental Protection set out to evaluate dewatering centrifuge technology to replace the existing centrifuges at Wards Island. After rigorous bidding, NYC choose to install (16) CS26-4 Centrisys decanter centrifuge.

On balance of objective criteria, Centrisys' system deemed superior

Using a matrix incorporating an array of weighted criteria established to seek the greatest overall value, CDM Smith ranked the products and manufacturers by their total scores.

Despite being the second highest in capital cost, the Centrisys CS26-4 came out on top due to facts including:

- Highest G-volume of installed centrifuges
- Highest torque capacity
- Lowest measured power consumption*
- Second-lowest operating costs
- Most installations worldwide for machines of this size and capacity
- The only centrifuge using an advanced hydraulic scroll drive instead of a gearbox
- Minimal structural and mechanical modifications needed for installation

*See chart on back. Bid #5 power consumption was a calculation.

Five Competing Centrifuge Systems of Similar Capacity Considered

The DEP enlisted one of the world's foremost water quality consulting firms for a feasibility study comparing the following models:

- **Alfa Laval G2-115**
- **Andritz CP4-1.2 (a retrofit using the same frame)**
- **Andritz D6LX**
- **Westfalia CF700**
- **Centrisys CS26-4**

All these models were mid-feed or counter-current designs using AC variable-frequency drives (VFDs) for the main drive motors. All evaluated centrifuges, with the exception of Centrisys, used various gear drive configurations – ranging from two- to four-stage planetary or cyclo-gear reducers. The Centrisys CS26-4 operates using its standard back drive system – the Viscotherm hydraulic scroll drive based on Rotodiff® technology, controlled through a VFD.

Better than Specification Performance

Performance testing for the Wards Island CS26-4 centrifuge installation demonstrated **better than specification performance results**.

- 50% power reduction compared to old centrifuges
- 25% higher throughput compared to old centrifuges
- 17% lower polymer consumption than specification
- 1% drier cake than specified and guaranteed
- 99% capture at 270 gpm (4% higher than specified and guaranteed)

The Centrisys Advantage: Easy Integration

The Centrisys engineering team integrated a centrifuge stand, diverter gate and interconnecting pipework into the plant design. These design elements created a "drop in place" centrifuge system, allowing for easy integration with only few minor modifications to the existing floor plan.

Centrisys' dewatering centrifuge installations are complete at two New York wastewater treatment plants. Sixteen CS26-4 centrifuges are installed at each location, for a total of 32 centrifuges, to dewater the city's anaerobically digested sludge.

Hunts Point Wastewater Treatment Plant
Field Acceptance Test | April 8, 2019

Prior to the field acceptance test, it was agreed to run only one Centrisys CS26-4 decanter centrifuge #5707 to validate previous acceptance testing. The previously installed centrifuge was also operating.

	Flow Rate [GPM]	Cake Solids [% TS]	Polymer Dose [lb/dry ton]	Capture Rate [% w/w]	Total Power [kW]
Bid Specs	175	29%	25	94%	60
Centrisys 5707	176	30.7%	22.8	98.3%	53.7
Centrisys 5708	175	30.1%	22.5	97.9%	54
Previous Centrifuge	146	27.5%	23.6	92%	102.1

Wards Island Wastewater Treatment Plant
Performance Test | July 12-13, 2017

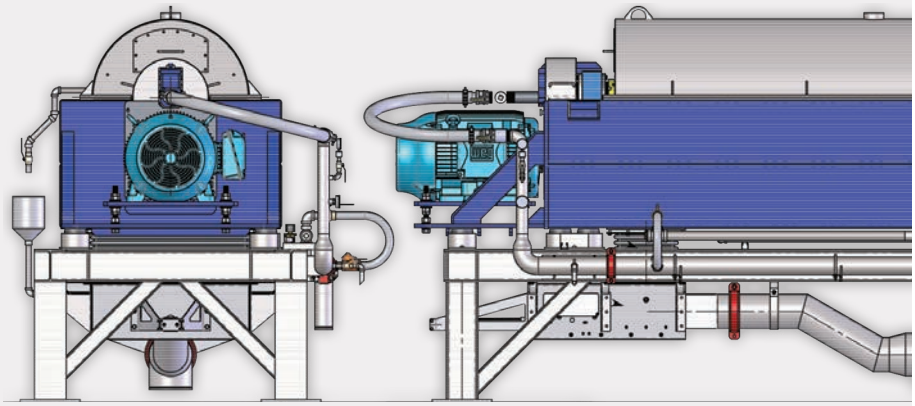
The data acquired below is from the Wards Island Process Control Laboratory. The New York DEP randomly selected two Centrisys CS26-4 decanter centrifuges #5703 and #5705, from the 10 installed centrifuges at the time, to conduct the 48-hour performance test.

	Flow Rate [GPM]	Cake Solids [% TS]	Polymer Dose [lb/dry ton]	Capture Rate [% w/w]	Total Power [kW]
Bid Specs	250	26%	36	95%	67
Centrisys 5703	252.5	26.7%	29.8	99%	62.53
Centrisys 5705	252.5	27.1%	28.2	99%	62.47
Previous Centrifuge	191.5	25.15%	17.63	0	118.56

Dewatering Specs

Centrisys CS26-4 Centrifuge
Wards Island + Hunts Point

Flow Rate – 200-400 GPM
G-Force – 3,000
Torque – 30,000 Nm
Standard Main Motor HP – 100 HP
Scroll HP – 25 HP
Beach Angle – 15 degrees
Bowl Diameter – 26 inches
Bowl Cylinder Length – 90 inches



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