

# Voith, RTS bring starting system to recip engines

EcoStart provides closed-loop, zero-emission startups. By DJ Slater

**V**oith Turbo and Reciprocating Technology Services (RTS) have collaborated on a product designed to ensure gas compression engines start up properly and consistently while also keeping emissions in check.

That product – the Voith EcoStart – is a hydraulic control system that functions as a starting system for reciprocating engines ranging from 1000 to 6500 hp (746 to 4847 kW). With its ability to precisely control hydraulic energy, the EcoStart can eliminate emissions when an engine starts, as well as provide slow roll and soft start capabilities.

"Essentially, the design efficiently utilizes hydraulic energy to provide precise control for multiple safe, reliable engine starts with zero emissions," said Thad Berry, a sales account manager with Voith Turbo. "It provides reliable, repeatable engine starts. We eliminate vented emissions during every start cycle."

## EcoStart's components

The EcoStart consists of an electric motor, integral gear pump, controller, oil supply and valving and flanging actuators all mounted



The Voith EcoStart provides zero-emission starting on reciprocating engines from 1000 to 6500 hp (746 to 4847 kW).

on a modular skid. Users have the option of adding redundant motors if needed.

Voith's starter engagement motors are mounted to the ring gear assembly on the engine and piped to hydraulic accumulators

and the skid, Berry said. The motors use soft-start engagement to ensure the gear teeth on the ring gear won't sustain damage. A high-pressure accumulator rack stores the EcoStart's pressurized hydraulic fluid. The system uses standard oil and pressurized nitrogen to retain a prime on the accumulator bottles, he said.

## Closed-loop system

The skid itself and the pumps only operate when the accumulator system recharges or when performing the slow-roll function. The

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EcoStart is also a closed-loop system, which makes it suitable for indoor installations or outside the engine hall, Berry said.

"EcoStart is a new item in Voith's portfolio," he said. "The key components and technology are drawn from Voith's other product lines and redesigned or repurposed for the EcoStart. This system can be modified for other industrial applications as new needs are identified by our customers."

### Origin story

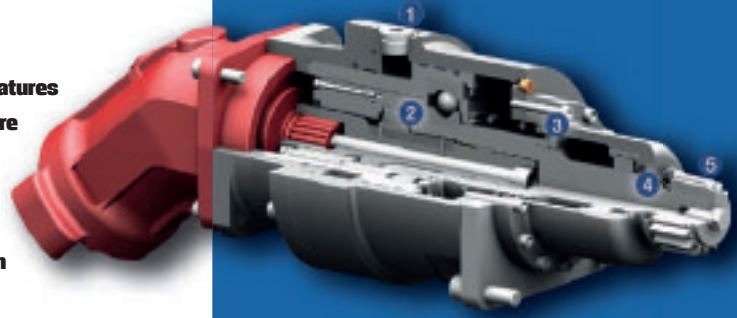
The EcoStart concept dates back to March 2015 when Voith and RTS met to discuss a common need from their respective customer bases – methods to reduce or eliminate vented emissions during engine starts. Given the prevalence of environmental regulations across the United States – some states having more strict regulations than others – the two companies developed the concept, which gained approval for further development in the fall of 2015, Berry said.

Voith and RTS did not have any competitive overlap, so the two companies viewed this as an opportunity to leverage each other's expertise, Berry said. Voith had domain knowledge and industry contacts, which they used to confirm technical details during the initial design. RTS had experience in a variety of installed base units, which was key for installing the EcoStart on several engine types.

"A large portion of the installed base remains in the midstream transportation segment," Berry said, adding that the system is equally beneficial

**The EcoStart provides mechanical slow-roll and soft start capability to reduce engine maintenance and improve safety. The EcoStart is a closed-loop system, allowing it to be used in outdoor and indoor environments.**

**The EcoStart hydraulic motor features**  
**1) engagement pressure connection, 2) one-way clutch,**  
**3) disengagement spring,**  
**4) engagement spring and**  
**5) a pinion**



in offshore, power generation and general industrial applications. "It's best for operators who fire up their engines with zero emissions and immediate starter power."

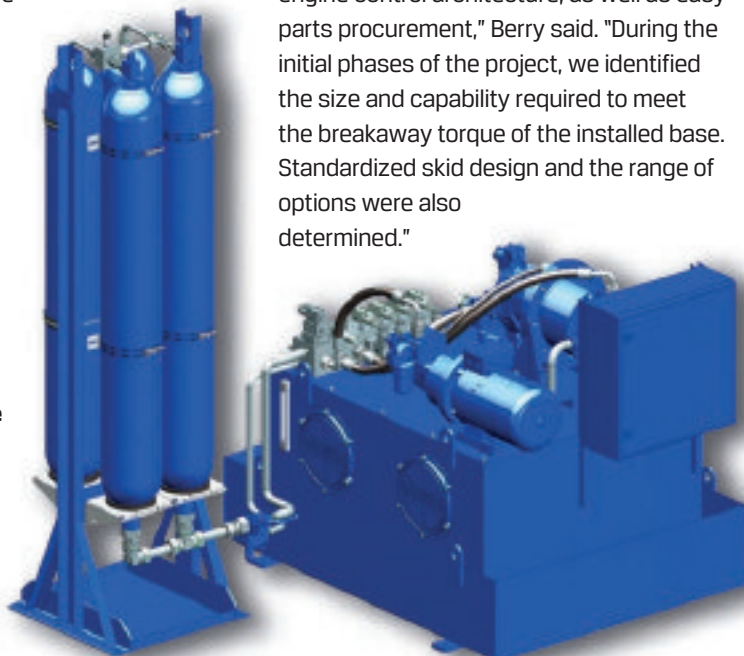
Post fall 2015, the two companies held site meetings with potential customers to gain feedback and insight on the evolving EcoStart. The key discussion points included enhancements to the skid, while other features were uncovered during this phase, such as the ability to start several engines and achieve quicker recharge times than comparable air starter systems.

Additionally, removing the pneumatic jacking system with slow roll eliminates a major safety hazard during maintenance, Berry said.

### First orders

This phase of development also addressed the service side of the system. The two companies tackled this with a commitment to provide spare parts availability within a 24-hour window, he said.

"The control panel utilizes COTS (commercially off the shelf) PLC technology for easy integration with the plant and engine control architecture, as well as easy parts procurement," Berry said. "During the initial phases of the project, we identified the size and capability required to meet the breakaway torque of the installed base. Standardized skid design and the range of options were also determined."



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The first purchase order for an explosion-proof model arrived in March 2018, which included the smallest available skid design (8 X 8 ft. [2.4 X 2.4 m]) for a 1000 hp (746 kW) engine. A larger EcoStart skid order came through in May 2018 for an application with a 4000 hp (2983 kW) engine. This explosion-proof EcoStart also contained redundant pressure controllers and motors, Berry said.

"There is a lot of industry interest in the EcoStart," he said, adding that the first installation of an EcoStart occurred in late 2018.

### Forthcoming features

Looking ahead, Berry said the next steps include providing auxiliary drive functions, which would replace multiple systems on the engine skid. The two companies are also researching different methods for driving the turbo assist as part of the EcoStart's start sequence.

"More importantly, we are eager to develop pull-through technology and concepts from the marketplace as soon as a product need is identified," he said. **CT2**