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# Science of separating slop oil:

## instrumentation and oil recovery

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**It's time for an oil change. You drive to a service center or—for the more mechanically inclined—change it yourself. Either way, the process is fairly simple: used oil comes out and new oil goes in.**

But what happens to that spent oil? Or oil from lawnmowers, boats, and tractors—or from industry?

Almost all of it can be recycled. In fact, in the U.S. alone, if just those oil change do-it-yourselfers recycled their used motor oil, there would be enough to lube up 50 million cars every year.[1]

Swedish company RecondOil is making this happen for industry—and on a large scale. With the help of process instrumentation and control systems from Siemens, each one of RecondOil's custom-built recovery centers is able to recondition up to 20 million liters of oil every year.

Siemens automation and instrumentation work together to recondition used oil.

### From slop to solid gold

Slop oil is a product at the end of its lifecycle. Created during the refinery process or from heavy use during manufacturing such as steel making, for example, slop oil cannot be used for any further lubrication purposes.

Using the Siemens Totally Automated Integration (TIA) Portal, the designers assembled all of the required components along with SIMATIC S7-1500 control system. Minimizing wires and maximizing mobile requirements, all instruments are connected with Profinet communications protocol.

Less than four liters of used oil can pollute upwards of 3.8 million liters of fresh water.[2] Companies are therefore responsible for safe disposal of their slop oil—and its associated costs.

Combine this with ever-tightening environmental regulations surrounding waste management, and the importance of a process to clean oil is evident.

Which is exactly where RecondOil enters the picture.

RecondOil designs leading-edge slop oil recovery centers custom-built for a customer's specific application requirements. The system can treat tar sands, ship sludge, and various kinds of industrial waste oil containing a whole host of contaminants.

To clean slop oil, recovery center machinery injects the perfect mix of chemicals into the process—a formula based on the science behind separation technology in the biotech industry. These separation boosters pull solid particles away from oil, leaving a final product that can be reused by the customer or sold for use in other applications.

**A high level of precision**

Slop oil first enters the recovery center and is pumped into storage vessels. The oil and water separate naturally, so vessels are equipped with Siemens SITRANS LG250 guided wave radar transmitters. The cable version of this economical transmitter accurately measures the interface level of the oil and water, relaying measurements to the facility's control room.

As high-level backup on each of these vessels, Pointek CLS200 capacitance level switches will alert operators if slop oil ever reaches a set point in the 16-meter storage vessels. Together with the guided wave radar transmitters, these level devices ensure that operators are able to monitor levels as slop oil and water separate in these vessels.

On process vessels in the recovery center, SITRANS LG250 cable and rod version guided wave radar transmitters monitor levels as the oil is heated or chemicals are added, continuing the separation of contaminants from oil.

Each of these vessels also has a SITRANS LVL100 vibrating level switch installed to alarm if oil reaches a set low level in the process vessel. Since oil is pumped from container to container, operators need to know if there is not enough oil in a certain vessel, as they don't want pumps to run dry.

For each of the 14 storage and process vessels, RecondOil chose Siemens guided wave radar transmitters to streamline the number of devices operators needed to be familiar with. This saves time in everything from installation and commissioning to maintenance down the road once the recovery center is up and running.

**Top-notch temperature tracking**

Like cold motor oil in a car during the winter, slop oil that gets too cool during the reconditioning process becomes quite sluggish. RecondOil therefore uses 23 SITRANS TS500 temperature sensors with SITRANS TH100 transmitters through the process to ensure oil temperatures stay consistently warm to allow for efficient pumping.

RecondOil's Founder and CEO, Fred Sundström, welcomes visitors to RecondOil to see their solutions for dealing with slop oil.


SIMATIC S7-1500 control system integrates the data collected by process instrumentation in a centralized location for operators to have easy access to their plant systems.

Another crucial measurement in the recovery center is pressure. SITRANS P220 compact pressure transmitters relay measurements to the control room. RecondOil chose this particular model because the transmitter's front membrane protects electronics from dirt and other contaminants in the slop oil.

**Connecting the dots**

All of these pieces of Siemens process instrumentation are the eyes and ears of the recovery center, while Siemens SIMATIC S7-1500 control system is the brains of the operation.

Once RecondOil finishes custom designing and building the recovery center at its location near Stockholm, Sweden, each center is shipped in several 12-meter containers to customers worldwide. Technicians then assemble and commission the recovery center, with all of the instrumentation connected to Siemens SIMATIC PLC.

From the comfort of their control room, operators can monitor every step in the process. If a particular instrument alarms or needs maintenance, technicians will know immediately.

Having only one supplier—Siemens—for the entire system means that devices work seamlessly and also reduces time staff spend in training.

**The future for slop**

With a limited amount of oil remaining worldwide, industry is looking for answers.

RecondOil's ability to maximize the lifespan of oil, to take a product like slop oil—that at one time could only be disposed of—and make it into something valuable again, is one such environmentally sound answer.

And industry has taken notice—customers from across the globe travel to the company's facility in Sweden to see how the recovery center works.

"We welcome visitors to RecondOil so they can see firsthand what opportunities we are creating every day with this innovative technology," says Founder and CEO Fred Sundström. "Together with Siemens instrumentation and control systems, we are changing the way companies deal with slop oil."

[1] From https://archive.epa.gov/wastes/conserve/materials/usedoil/web/html/index.html

[2] From https://www.epa.gov/recycle/managing-reusing-and-recycling-used-oil

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