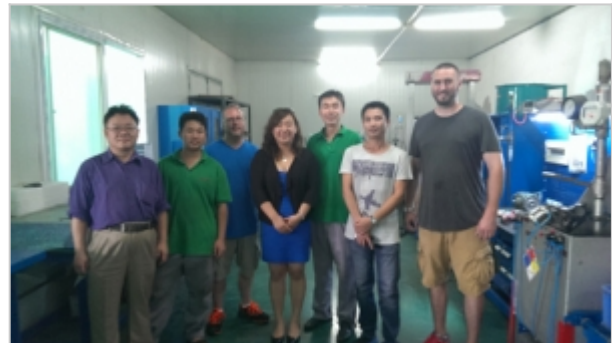


Petrol PLAZA

Husky Corporation Engineering Triage Team



For customers with equipment problems, the most frustrating thing they can hear from the repair engineer is “There is no problem when we test it in the lab. It must be an intermittent issue and those are really tough to diagnose.”

Take, for example, the vexing issue certain Chinese customers were experiencing with Husky Corporation’s V34i Vapor Recovery Nozzle, a highly reliable product used in many countries to capture gasoline vapors at the nozzle. But Husky engineers started receiving complaints from China that the nozzles sometimes, without explanation, failed to shut off and spilled fuel. It was an issue Husky took very seriously.

The Triage Team

Husky Corporation recognized long ago there is a huge difference between the pristine conditions of controlled engineering laboratories and the real world conditions where equipment is actually used. So the leading innovator and manufacturer of fuel nozzles, safe-t-breaks, hoses, and accessories will

dispatch engineers around the globe to investigate issues in the field. The 'Engineering Triage Team' can fully understand field conditions then deliver solutions.

"When customers are concerned about the performance of our products, we need to be there face to face, with our most knowledgeable resources available to troubleshoot in real time. Our customers value the dedication we have to making our products operate in all conditions – whatever they are," said Brad Baker, Husky Corporation Executive Vice President.

For the past eight years in the United States, and the past five years around the world, a Husky Engineering Manager and Product Engineer have traveled to investigate issues that elude laboratory-only solutions. The Triage Team developed a protocol, a battery of questions, instruments to gather field data – including flow, pressure, pressure-at-flow, static pressure, vacuum activation pressure and hydraulic hammer – and a tool kit to diagnose situations in real time.

"You can't always capture the real issue using the phone, fax, email or video conference. Things get lost in translation, even when people speak the same language. Going to the field where the issue occurs allows us to see first-hand what kind of environment our customers are really dealing with," Brown said.

Low Flow in China

Brown and Product Engineer Jerry Mahn spent two weeks in China in early 2013 investigating how the V34i was being used at gas stations maintained by Bay Environmental Technology Corp. (Bayeco) at locations owned by the world's largest oil producer.

"It was very exciting that the Husky engineers traveled to China to investigate the problem thoroughly. They got first-hand information on site, not just feedback from Bayeco," said Xiaoyu Shang, Bayeco Marketing Director.

"You cannot study and fix everything in the laboratory. You can try your best to replicate the issues. But you have to go into the field. You have all the operational elements to consider. It's extremely important to get a first-hand look and study it closely," Mahn said.

The team noticed a wide variety of dispensers and pumps using the V34i before discovering the fundamental issue. A significant number of fuel dispensing systems in China use suction-pump systems to withdraw fuel from underground storage tanks (UST). The Husky team discovered that when more than one customer was drawing fuel from the same UST, the suction-pump system was not able to generate sufficient fuel flow to cause the nozzle to shut off. And the problem only occurred in systems using suction pumps.

"The nozzle is designed to exceed the Underwriters Laboratories standard, which calls for a minimum of five gallons of flow per minute to shut off. The V34i will shut off at just 2 gallons per minute," Brown said. "The problem was at the pressures they were generating when the system had high demand, the nozzle was not able to flow enough to shut off. The flow rates were lower than the V34i was

designed for.”

The team reviewed security camera video of spills, which showed a trickle of fuel running down the side of the car when the problem occurred. It was a key piece of evidence illustrating the issue.

“When it did occur, the spill rate was minimal. But had it been flowing at a rate that would cause the nozzle to shut off, the flow would have been an even larger issue,” Brown said.

Armed with the data, research, and field observations the Triage Team returned to the Husky engineering lab and replicated the conditions they witnessed. The solution required a nozzle that would shut off at the low available pressures in China’s suction-pump dispensing systems. Ironically, the solution resided in a Husky Corporation nozzle that had been in use for years on U.S. farms. Those nozzles rely on gravity to deliver fuel from above ground storage systems for agriculture equipment.

“We realized we had a whole series of components that already were optimized for low flow rate situations in the nozzle we use for farm applications. So we put those components in the Chinese version of the V34i. It solved the problem,” Brown said. “Once we got back in the lab, we had it solved in about six hours. But we did have to fly to the other side of the world to find out. That was way more than half the battle.”

“During the visit we discovered something causing the problem which we never thought about before. That helped the Husky engineers improve the product for the Chinese market,” Shang said. “Overall, we are satisfied.”

Pressure in Korea

The Husky Triage Team solved a problem in Korea a few months later where the circumstances were reversed.

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