

DRILLING ADVANCES

JIM REDDEN, CONTRIBUTING EDITOR



Old-school can't be ignored

To this day, I can almost feel the mini-hurricane whipped up by the Chinook as it hovered over Villano field in Ecuador's Oriente rainforest. Braced against a trailer, I watched it meticulously handle a long-line delivery of, what I recall, was drill pipe, but frankly, I was more fascinated by the mechanical dexterity of the helicopter than what it was dropping off.

That particular operation and the others I saw during a week on location went off without a hitch, but, unfortunately, all-too-often, that has not been the case. Over the years, it has been painfully evident that these largely indispensable workhorses can just as easily become occupational hazards. That reality was borne out in an April 2013 report by the U.S.-based Center for Disease Control and Prevention (CDC), which cited transportation as the root cause of 65% of U.S. oilfield fatalities during 2003–2010. Of these, three out of four involved helicopters in Gulf of Mexico service.

Those grim statistics have inspired helicopter manufacturers of late to replicate the automated systems of their fixed-wing counterparts, just as commercial airlines are bolstering their pilots' manual flying skills to better respond to emergencies on über-automated jetliners. Of the new systems being incorporated, a June 17 *Wall Street Journal* article particularly cited automated approach and hover systems, specifically geared for offshore rigs and platforms.

Recently, I spoke with someone, who knows of which he speaks, and his contention is that the growing love affair with automation step in the right direction, must come with a caveat, and one that offers a cautionary tale as automated drilling processes continue to take hold.

"Ultimately, if you've had solid training with it, automation can do some great stuff. The aircraft will be a lot safer, but you run the risk that when it breaks, it breaks really badly. There's no in-between if you don't have the pilot skills to recognize the problem and deal with the problem," said Matt "Camel" Mato, a former military and commercial airline pilot

turned product director for the Check Six oilfield-directed RIGOR digital checklist and compliance system.

Whether pilot, or driller, he said "old-school skills" not only remain relevant, but actually must be accentuated as processes become increasingly automated. "There's always a danger in over-reliance on automation. Automation definitely drives safety and performance, but what we find is that people come to think of automation as a catch-all for everything. In reality, automation requires much higher levels of training for the human in the loop."

Reverting to his aviation roots, which included designing the training system for the F-35 fighter jet, Mato said "modal confusion" was cited as one of the root causes of the 2009 crash of Air France flight 447 from Rio de Janeiro, Brazil to Paris that killed all 228 on-board. In other words, the heavily automated jumbo jet went into a cycle the pilot did not recognize and consequently failed to respond accordingly, with tragic consequences. While, thankfully, a hiccup in an automated drilling process would likely never eclipse that level of catastrophe, but at the very least, it could result in non-productive time (NPT), that operators can ill-afford, especially today.

"The tendency is for people to say, 'we've put automation in there, so we don't need to train people as well,' but actually, the reverse is true. If you want to take full advantage of automation, you have to train your people even better. They have to understand what the automation is doing and they have to be able to recognize and interpret when automation has gone sideways," he said. "The person operating the equipment needs to know when it's time to intervene."

"The worst thing that can happen is for the drill crew to get to the point that they decide the system's got it, so I don't need to worry about it. 'We have automatic kick detection, so the well will shut in automatically.' But, there's no replacement for a drill-

er sitting there, and well-trained to recognize a kick and know when it's appropriate to shut in a well," he said.

VALVES OPEN, CHECK

To that end, Mato said modified versions of the checklists airline pilots use, as a matter of course, take on pivotal roles in automated processes by helping even the most experienced hand recognize and respond when a deviation occurs. Digital checklists also have been tailored to provide detailed roadmaps for specific operations, such as emergency BOP stack pulls and re-installation, as well as pre-frac and post-frac operations.

"A checklist is a fundamental tool for helping you recognize deviations. When you automate, you have specific algorithms in place, and you expect things to go in a certain way. A checklist gives you an easy tool for identifying when a deviation is occurring and then provide a quick game plan for dealing with those deviations," he said. "In a stressful situation, you want to unload the cognitive stress on the human in the loop. We've done some of the thinking for them ahead of time and gave them the tools to quickly deal with the situation. They don't have to think through the whole situation and can immediately take care of the critical path items."

Mato admits there is some pushback from veteran rig hands, who see checklists as an affront. "The initial reaction is that they think you're taking something away from their professionalism and that's not it at all. The idea is, we want to take the basic stuff off your plate, so you can be freed up to deal with the intricacies at hand," Mato said.

"Let's face it, even the most experienced people make mistakes sometime. I tell them that as a pilot, with thousands of hours flying an aircraft, I've made several thousand landings. And, I went through a checklist every time." **WO**

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