

# First-of-a-Kind IVVI Robot

By Jerry Dolan, GE Hitachi Nuclear Energy.

## Jerry Dolan

*Jerry Dolan is a Senior Tooling Manager for GE Hitachi Nuclear Energy (GEH) responsible for Stinger development and delivery working for GEH in its In Vessel Visual Inspections (IVVI) Group. A veteran of nearly 28 years of technical design, installation and maintenance of industrial automation and instrumentation and control systems, he was the customer interface for a variety of commercial and industrial instrumentation systems. As a manager for a major industrial automation and controls systems company, he managed groups of engineers and technicians who satisfactorily delivered projects for his customers on time and under budget. This combination of hands-on experience and knowledgeable business savvy makes him the ideal Project Manager for Stinger.*

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*Note: IVVI is an intelligent vehicle based on visual information.*

## Reducing Dose and Adding Flexibility

During the 2013 Spring Outage season, GE Hitachi Nuclear Energy (GEH) and its BWR experts teamed with Southern Nuclear Operating Company (SNC) for the first deployment of GEH's new Stinger™ In-Vessel Visual Inspection (IVVI) tool at the Hatch Nuclear Plant. The Stinger tool provides BWR plants the ability to remotely conduct in-vessel visual inspections and to perform cleaning tasks during critical path activities, which directly reduces dose and the time needed to conduct visual inspections.

Legacy BWR inspection technology consisted of hand-held, pole-mounted cameras operated by personnel positioned over the refueling cavity. These personnel, in turn, were close to radioactive sources and were impacted by various other maintenance activities that were required to be performed in the reactor vessel throughout the outage. By comparison, Stinger allows

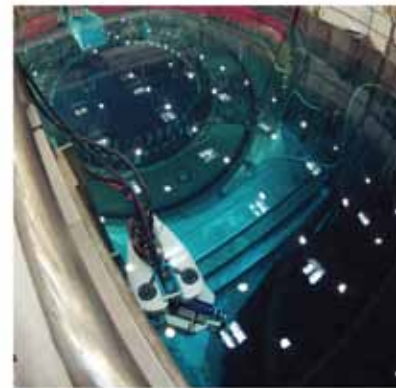
personnel to remotely perform IVVI inspections, away from other critical outage activities while at the same time providing higher quality examinations through the use of high resolution video.

Through advanced camera and remote positioning technology developed by GEH with input from our customers, Stinger allows outage personnel to clean and examine IVVI components from the annulus floor to the RPV flange without tool removal or reconfiguration. Remote operation of Stinger allows for uninterrupted fuel movement. Inspections may be performed in parallel with fuel movement and other critical path activities. Stinger can also inspect the open slot area below the steam dam when a 360 degree platform is used. Allowing workers to operate the Stinger remotely ensures reduced radiation exposure, thus helping plants meet their ALARA goals.

In June 2012, the Stinger tool's capabilities were demonstrated to several

utilities, including SNC, at GEH's BWR training facility in San Jose, CA. The GEH BWR training facility is the testing ground for new technologies used in the field for operating nuclear power plants around the world. It was the first facility of its kind capable of full scale simulation of nuclear plant refueling and maintenance activities. Impressed with the Stinger demonstration, SNC decided to pilot the tool during the 2013 Spring Outage (RFO22).

Stinger's performance at the Hatch site during RFO22 can be summed up



**Stinger docked in the Dryer Separator Pool (DSP) at Southern Nuclear Operating Company's Hatch Nuclear Plant .**

by one of SNC project managers, as follows: "Overall, Stinger provided very good service," said Project Manager Roger McDonald. "The new technology allowed us to work in parallel with [the] inspection process and maintain our outage schedule."

The tool's remotely operated technology, weld cleaning, image quality, and radiation tolerance were all proven during the Hatch outage. Equally as impressive, 100 percent of Stinger's scope was delivered on time. Based on the Hatch results, there seems to be little doubt that, by using this new IVVI technology, higher quality exams can be achieved and safety can be increased through dose reduction.

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