

# The Profiler

A NEWSLETTER OF INFORMATION FOR COKE DRUM OPERATORS

## Remote, Robotic Internal Crack Detection Service

CIA Inspection will soon be launching a new service aimed at performing remote internal crack detection for coke drums and other refinery applications.

When CIA identifies areas of concern during a laser and remote visual inspection, a decision must be made whether to follow-up on the indication or wait until the next turnaround.

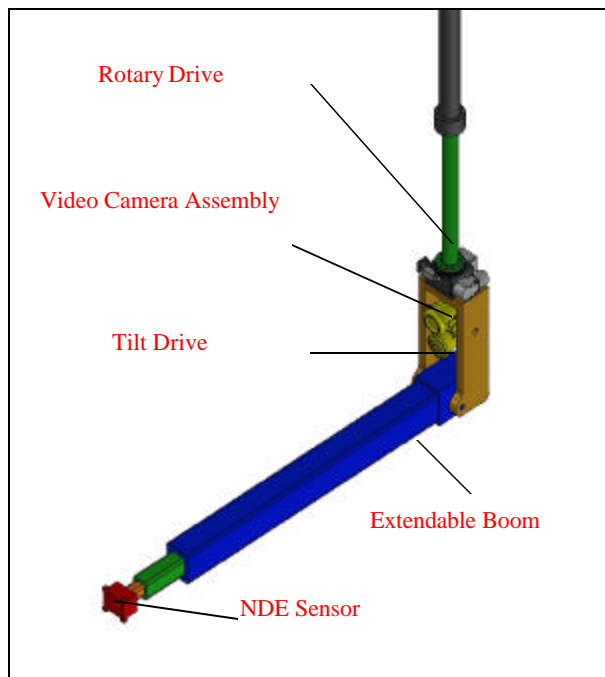
Traditionally, external conventional NDE methods such as SHEAR WAVE or TOFD are used to these areas of concern to determine both the location and magnitude of the flaw indications.

Access to these areas is very difficult and requires the installation of scaffolding and the removal or insulation and other surface preparations.

CIA has been searching for a means to quickly verify the presence of cracks in the failure prone areas from inside of the vessel without having to scaffold, remove insulation or prepare the surface of the area to be inspected.

A variety of technologies were considered and, after careful consideration, ACFM was selected as the most appropriate technology for this particular application.

ACFM is an electromagnetic technique for detecting and sizing flaws



coke drums include its suitability for remote, robotic deployment and the ability to work on relatively dirty surfaces.

CIA's system uses a custom designed ACFM sensor head composed of an array of individual sensors incorporated into an integral package. The size and spacing of the sensors are configured depending on the target defect size and other operating factors.

The equipment is designed to scan the com-

breaking the inspection surface of both ferrous and non-ferrous metals and alloys. ACFM is an acronym for alternating current field measurement.

Its conventional application is for the detection and characterization of fatigue cracks in and around welded joints but is increasingly used to detect a variety of surface breaking defects.

Since 1991 it has been used routinely for the inspection of underwater structures and is also being used in the petrochemical, nuclear, steel and railway industries.

Key features of the technique that lends itself to internal inspection of

complete weld, both toes and a little into the heat affected zone in one pass. This is achieved by using 16 sensor pairs in the probe.

The sensor package can be inserted from the top head using the drill stem in a manner similar to our existing service. This follow-up inspection to verify and characterize indications can be performed between cycles, on-line without the need to blind the vessel.

CIA's Rick Clark will be presenting a paper on this subject in Bahrain, November 27 - 30, 2005 at the Third Middle East Non-Destructive Testing Conference and Exhibition.

