



CIA Inspection Inc.

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The Profiler

A NEWSLETTER OF INFORMATION FOR COKE DRUM OPERATORS

Remote Visual Inspection - the Wave of the Future

CIA Inspection's remote visual inspection capability has evolved from its original task of laser location to a viable alternative for out-of-service internal inspection of coke drums.

CIAI's laser profiling system provides a comprehensive internal dimensional profile. This "baseline" scan gives the owner/operator a base line profile of the drum, which is used for determining drum profile changes throughout the life of the coke drum.

CIAI's remote video inspection system is used for laser start reference point location, verification of weld locations as well as wide angle viewing for general drum condition and close up detailed inspection of circumferential welds. The results are recorded on VHS tape. The system uses the same azimuth and elevations as the laser profile so direct correlation is made between the laser profile data.

With its 14x-zoom camera, CIAI is capable of identifying surface stress cracking along the toes of circumferen-

cial welds. CIAI's equipment conforms to ASME Sec. V., Article 9, T-953 for Remote Inspection Requirements. The equipment has the capability to size anomalies open to the surface at full zoom.

As with any surface inspection method, the cleanliness of the inspection service limits the results. The cleaner the drum's surface the better the remote inspection results.

By using CIAI's remote visual and laser profile inspection in conjunction with vessel historical data, customers have been able to extend their out-of-service code inspection interval.

Relevant in-service anomalies are captured in digital form with the drum ID, azimuth and elevation references recorded. These images, with an interpretation, are part of CIAI's customer report. This allows assessment of the anomaly without having to review up to two hours of videotape.

From CIAI's interpretation, recom-



Cladding delamination as viewed from the video inspection and captured in digital form

mended follow-up allows volumetric assessment from the drum's outer surface. In the case of prominent indications such as open cracking, follow-up evaluation should be conducted as soon as possible to assure pressure boundary integrity. With tight surface type indications the follow-up evaluation can be carried out on-line at a later date.

The use of these follow-up inspection methods characterize and verify anomalies found during the remote visual inspection.

WELCOME ABOARD !!!



CIAI would like to welcome Rowland Scarr to the coke drum inspection team. Rowland comes to us from England and has a background in QA/QC inspection with particular expertise in coking plants. He may look familiar to some of our Conoco customers as he has worked at the Humber Refinery in England.

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India - CIA Begins Work with Reliance Refinery



Some of our new colleagues in India

CIA Inspection once again expanded its international market for coke drum inspection.

After completing an 8-drum inspection at the Reliance Refinery in Jamnagar, India, a side trip into the city gave the inspection crew a chance to experience

all the delights of this unique country. The crew was able to shop at the markets as well as taste some Indian cuisine. It was definitely an experience of a lifetime.



Camels, along with bicycles and scooters, all share the road in India.

Next stop – China!!!



Outdoor markets are a way of life in India. Everything from grains to fruit and vegetables as well as meat and fish are sold at many of these markets.

“Coking Corner” - Follow-up Inspection Recommendations

No single inspection method will determine the ultimate condition of a coke drum. Along with CIAI's inspection methods, the following techniques are aimed at improving the reliability of coke drums.

The ultrasonic test method is one recommended follow-up on visual indications from the remote video. Anomalies are located and evaluated externally using the azimuth and elevation data provided from CIAI's inspection. With the insulation removed and the drum surface suitably cleaned, the anomaly can be evaluated.

Due to the complex metallurgy of coke drum welds, conventional shear wave UT is problematic and subjective in

evaluating and sizing tight surface cracking at the toe of circumferential welds. In some cases, obvious visual indications could not be verified using this technique.

These problems can be overcome by using the TOFD (time of flight diffraction) ultrasonic test method. This UT technique differs from other UT methods because TOFD relies on the detection of diffracted rather than reflected signals. It relies on the detection of relatively low amplitude signals diffracted only from the tips of defects.

Capturing these responses and processing them in a manner that allows them to be discriminated from background and structural noise is possible. This

creates a differential image showing the presence and the location of a defect accurately positioned with respect to the geometry of the test area.

Another advantage of TOFD is the speed in which the data is gathered because it is a single pass collection technique. This is an ideal tool for defect detection and screening, critical sizing, defect characterization and propagation monitoring. The data can be produced as hard copy on line as well as digitized and stored on magnetic media.

For more information on this technique and its application to your site, please contact Mark Anderson at 905-692-0585 or manderson@cia-inspection.com.

Upcoming Conferences of Interest

AICHE - March 10-14, 2002 - New Orleans, LA (www.aiche.org)
(CIA will be presenting a paper)

NPRA - March 24 - 26, 2002 - San Antonio, TX (www.npradc.org)

API - April 21 - 25, 2002 - Chicago, IL (www.api.org)
(CIA will be hosting a booth at the Monday night welcome reception)

“Bottom of the Barrel” - April 23- 25, 2002 - Houston, TX (www.coking.com)
(CIA will be presenting)

“Universal Cokingokers” - June 3 - 5, 2002 - Seattle, WA (www.cokingokers.com)

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