

# The Profiler

A NEWSLETTER OF INFORMATION FOR COKE DRUM OPERATORS

## Innovative NDE Inspection for Coke Drums

CIA Inspection is pleased to announce its partnership with S.H.I. Examination & Inspection Ltd. (SEI), which is a subsidiary of Sumitomo Heavy Industries Ltd. to offer an innovative NDE inspection technique for coke drums and other refinery clad vessels.

Performed externally, this new “Phased Array and TOFD Simultaneous Ultrasonic System” offers more accurate detection and sizing of flaws in both circumferential and longitudinal weld of coke drums.

To overcome the individual shortcomings of shear wave and TOFD UT approaches, the AUT system combines both into a computer-controlled automated data acquisition system.



*SEI personnel on-site with AUT equipment*

### Why should we choose this service over Conventional Inspection Methods?

Standard TOFD and/or conventional manual UT have difficulty detecting flaws in the clad restoration weld. However, Phased Array can clearly detect

and size the low cycle fatigue cracks caused at the clad restoration weld and its heat affected zone. Standard TOFD cannot detect the flaws near the scanning surface.



*Post fabrication inspection using AUT system*

Dual TOFD uses two (2) kinds of TOFD inspection heads simultaneously to obtain more reliable inspection results than Single TOFD.

The best arrangement for Dual TOFD is two sets of probes, one high frequency set and one lower frequency set. It is very sensitive to all kinds of defects and with a simultaneous reading of both sets of probes; a fast one-pass inspection of the welds is possible.

The Dual TOFD/Phased Array Simultaneous Inspection is best performed during the beginning of a turnaround or other out-of-service condition for the coke drum. AUT can be performed online as long as the temperature variables of the coke drum are known.

### Advantages of the SEI AUT system

- It is faster than a combination of individual UT methods
- Two to three circumferential welds

can be completely inspected in a single shift

- There is a more accurate detection and sizing of flaws in both circumferential and longitudinal welds of coke drums than any individual UT method
- Provides a complete assessment of all parts of a coke drum weld
- It has been proven against established radiographic results.

This technique was developed for use during coke drum fabrication in Sumitomo’s factory and is used extensively for that purpose.

It has been successfully used on in-service coke drums in Japan and Venezuela and is now ready for use worldwide.



*Signing of agreement - Katsushige Nakashima - President of SEI & Rick Clark of CIA*

On CIA’s website ([www.cia-inspection.com](http://www.cia-inspection.com)) there is a link to a paper written by the Sumitomo team who developed this technique which clearly illustrates the results of this system. For more information within North America, please contact Rick Clark at 905-692-3678 or by e-mail at [rclark@cia-inspection.com](mailto:rclark@cia-inspection.com).

## CIA Increases its International Presence

CIA's inspection crew was kept busy this summer as they further expanded the remote laser and video inspection service in Egypt and Italy.

CIA performed a two drum inspection at the Midom Refinery in Alexandria, Egypt. Alexandria lies north-west of the Nile delta and stretches along a narrow land strip between the Mediterranean Sea and Lake Mariut (Mareotis).



*Rick Clark and family on Camel Mounts in front of the GIZA Plateau with the Pyramids of Cheops in the background*

The second largest city and the main port of Egypt, Alexandria was built by the Greek architect Dinocrates (332-331 BC) on the site of an old village, Rhakotis, at the orders of Alexander the Great.

The population of Egypt is 74,718,797. The climate of Egypt is characterized by a hot season from May to September and a cool season from November to March.



*The Sphinx in front of Cheops Pyramid*

Egypt is most famous for its pyramids. Today, the Great Pyramid is enclosed, together with the other pyramids and the Sphinx, in the tourist region of the Giza Plateau.

When it was built, the Great pyramid was 145.75 m (481 ft) high. Over the years, it lost 10 m (30 ft) off its top. It ranked as the tallest structure on Earth for more than 43 centuries, only to be surpassed in height in the nineteenth century AD.

CIA also performed a two drum inspection at the Agip Petroli Refinery in Gela, Italy this summer. The Greek city of Gela is located on the south coast of Sicily in the Salso Valley.

The population of Gela is 76,520. It rises over a coastal flat area, 45 meters above the sea-level. It is a port, industrial center, and seaside resort.

Gela, named for the river that runs beside it, was founded in 689 B.C. by colonists from Rhodes and Crete. In 310 B.C. Gela was conquered by Syracuse and was reduced to a military base occupying only the western part of the ridge top.



*Mark & Cindy Anderson and Rick & Judy Clark in front of an old castle on the shores of the Mediterranean Sea near GELA*

Around 284 B.C. Gela was destroyed and all of its inhabitants were moved to the new city. Gela remained deserted until the medieval town of Terranova was built on the site in the 13th century. In 1927, Terranova was renamed back to Gela.



*Valley of the Temples - Agrigento, Sicily Temple of Concord*

### Upcoming Conferences of Interest

**NPEC (National Pressure Equipment Conference)** - February 4-6, 2004  
Alberta, Canada ([www.npec.ca](http://www.npec.ca))

**"Bottom of the Barrel"** -  
March 30-April 1, 2004 -  
Houston, TX ([www.coking.com](http://www.coking.com))

**API** - May 17-19, 2004,  
Atlanta, GA ([www.api.org](http://www.api.org))

**NPRA** - May 25 - 28, 2004 San Antonio, TX ([www.npradc.org](http://www.npradc.org))

**Universal cokingokers.com** Delayed  
Coking Seminar June 8-10 2004, Long Beach, CA ([www.cokingokers.com](http://www.cokingokers.com))

### HAPPY HOLIDAYS!!!

The team at CIA Inspection would like to wish all our customers and their families a very happy and safe holiday season.

See you in 2004!!!!

#### CIA Inspection Inc.

Canadian Office:  
2399 Golf Club Road  
Hannon, Ontario Canada L0R 1P0

U.S. Office:  
13800 Westfair East Drive  
Houston, TX 77041-1101

Phone: 905-692-3678 Fax: 905-692-5410

Email: [rclark@cia-inspection.com](mailto:rclark@cia-inspection.com)  
[jcameron@cia-inspection.com](mailto:jcameron@cia-inspection.com)  
Web site: [www.cia-inspection.com](http://www.cia-inspection.com)