

Case Study Beacon - 2000

The Long Term Performance of an Online Process NIR Analyzer for Diesel Fuels

Case Study Objectives

To evaluate the long term performance of the Beacon – 2000 On-line Process NIR Analyzer used for Diesel Fuels application. To focus on economic and environmental benefits that achieved by Beacon - 2000 in process implementation.

Project Specifications

Petroleum Refinery located in Kansas operates a 115,000 barrel per day. Crude oil and other unrefined petroleum inputs are converted in this refinery to high value, clean transportation fuels, such as gasoline and diesel fuels. Refinery uses advanced processing units capable of processes like thermal coking, catalytic cracking, isomerization, alkylation or reforming and processes moderately heavy, medium sulfur crude oil from a broad array of domestic and international sources and predominantly produces clean transportation products such as gasoline, diesel fuels, and propane.



Site Description

An oil refinery in Kansas uses on line NIR (Near Infra-Red) analysis to monitor its crude distillation. The NIR instrument is a PetroMetriX Beacon 2000 analyzer and its installation took place at 1997. A fast sample loop connects the intrinsically safe sample probe to the fuel streams as shown in the Figure 1). Two distillation towers are monitored using the Beacon's multiplexing capability. The same instrument measures an additional Reformate stream. Standard telecommunications fiber optics connects the sample probes to the main analyzer, which is located in the crude unit instrument room.

The analyzer was installed with a x7 multiplexer, to allow simple expansion of the system in the future. The analyzer communicates with a Honeywell TDC3000 through a Modbus interface. Communication with the TDC300 is bi-directional, so the analyzer can receive commands sent to it by the operators in the control room.

Customer Benefits

- The on line data provided by the system is used by the TDC 3000 for process optimization.
- The Beacon NIR system can be easily expanded to measure other process streams in the refinery.

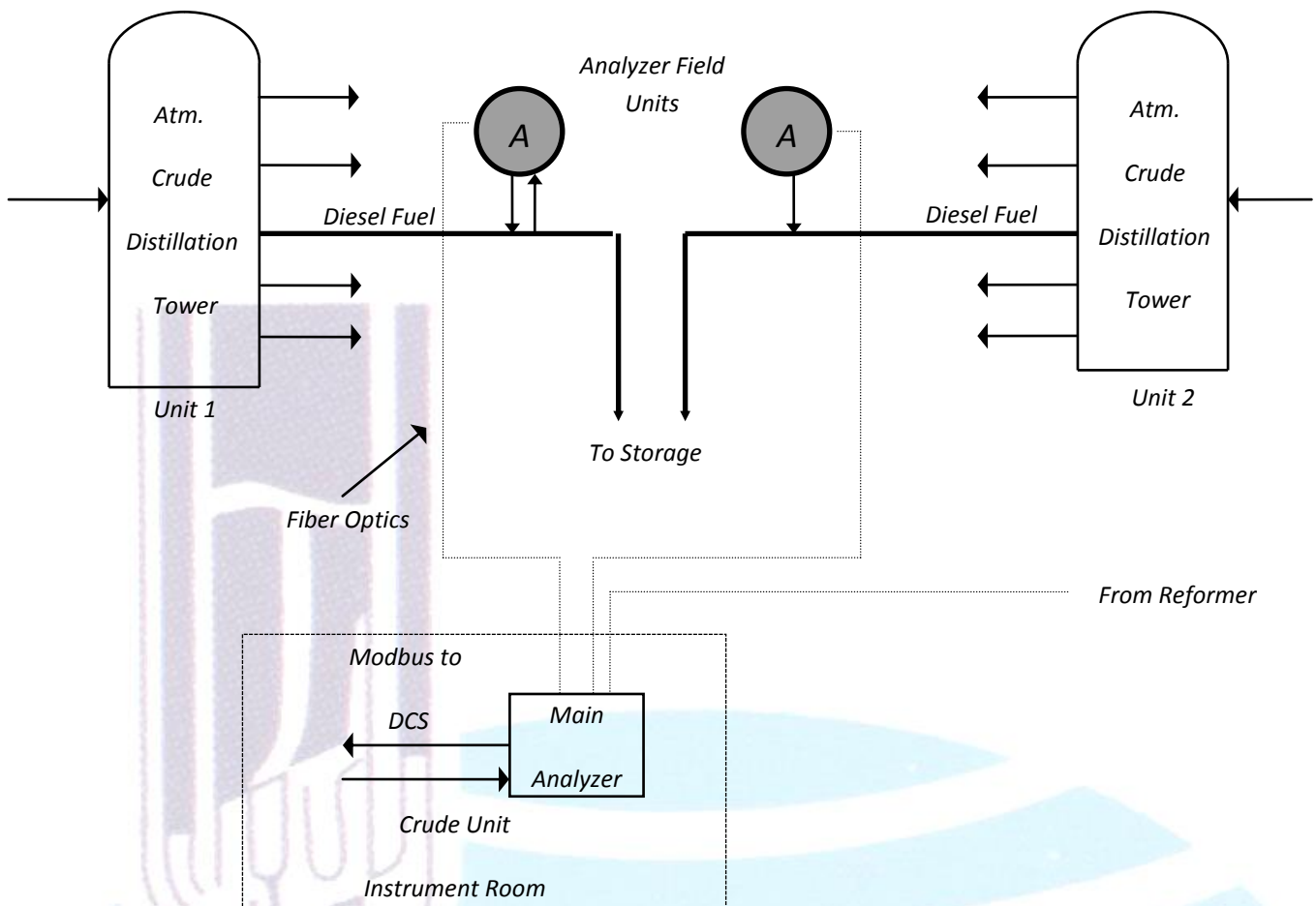


Figure 1: Scheme of On-Line NIR Analysis of Diesel Fuels

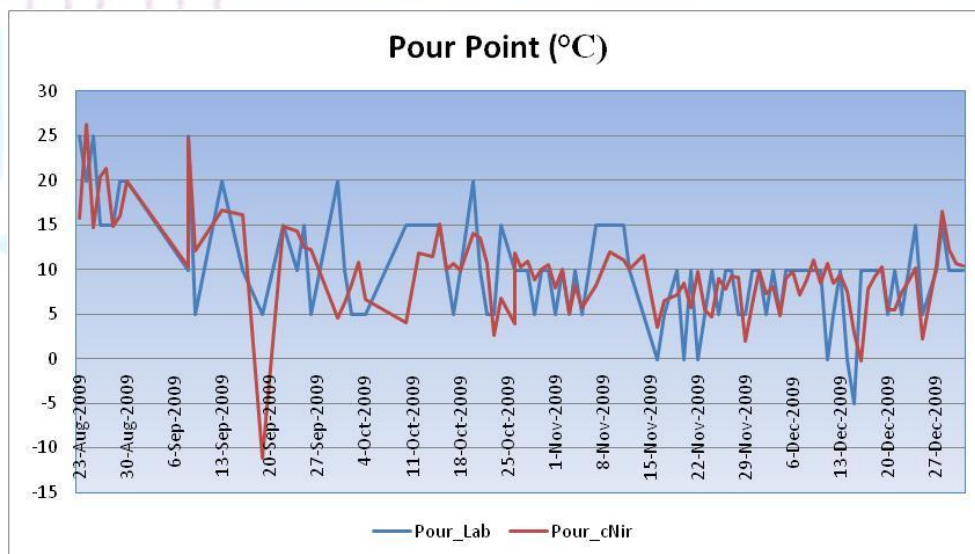


Figure 2: Diesel Fuel Pour Point

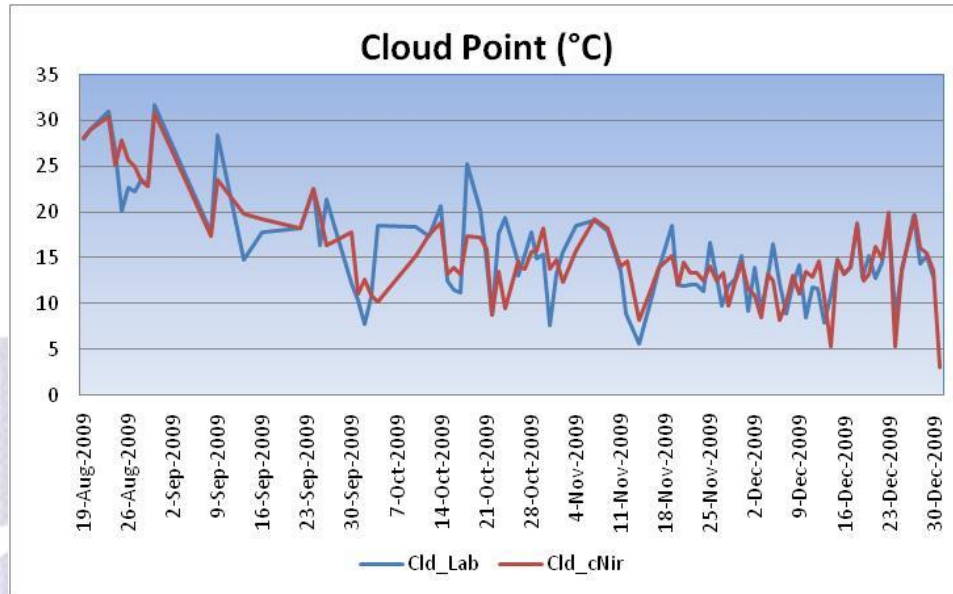


Figure 3: Diesel Fuel Cloud Point

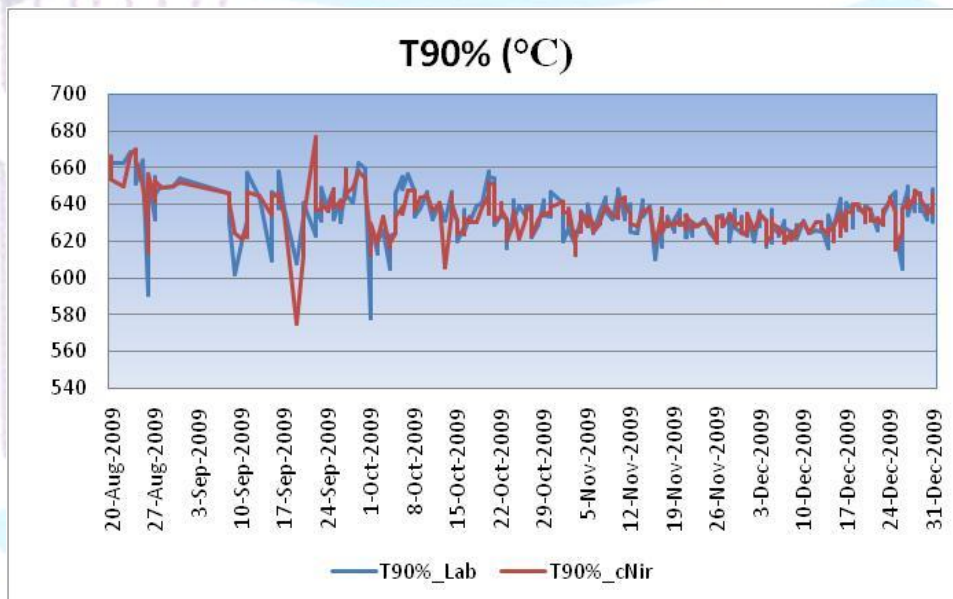




Figure 4: Diesel Fuel T90%

Case Study Summary

The process on-line NIR Beacon-2000 Analyzer is being functioning for more than decade. Since 1997 it is providing stream characterization to the control room which is being used for process optimization. This solution has proven to be a cost effective project. The Beacon-2000 NIR Analyzer commissioned at 1998 and bedded in the on-line process gave better accuracy, up-time and repeatability with very low maintains during all the past period. Later, the Analyzer system was expanded to more probes which were installed at Isomerization, FCC and Hydrogen bottom processes. The system upgrade was done with a very low additional cost which made its acquisition very profitable in comparison to its initial price.

Since 1997 a minimal model update and maintains was required. This was achieved due to successful implementation of  software program whose main purpose was to cover all variations of the product composition, which constantly change over time. The main concept behind  is linking the analyzer to the plant information system, utilizing the available plant data for automatic model tuning.

The tight collaboration through the installation and farther support from the validation and up to date that what made this installation so successful. In order to keep the NIR Analyzer on-line process technology up to date Modcon-Systems LTD. with its daughter company PetroMetriX released the new generation Beacon-3000 NIR Analyzer which is characterized by modern electronics and AMS software which enables more efficient performance.



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Headqurters: P.O.Box 24121 Akko 2202 Israel, Tel: (9724)9553955, Fax (9724)9553956

E-mail: sales@modcon-systems.com www.modcon-systems.com

Azerbaijan: (99412)4189859 **UK:** (44207)5043626 **USA:** (1917) 5916880 **Russia:**(7095)2349908