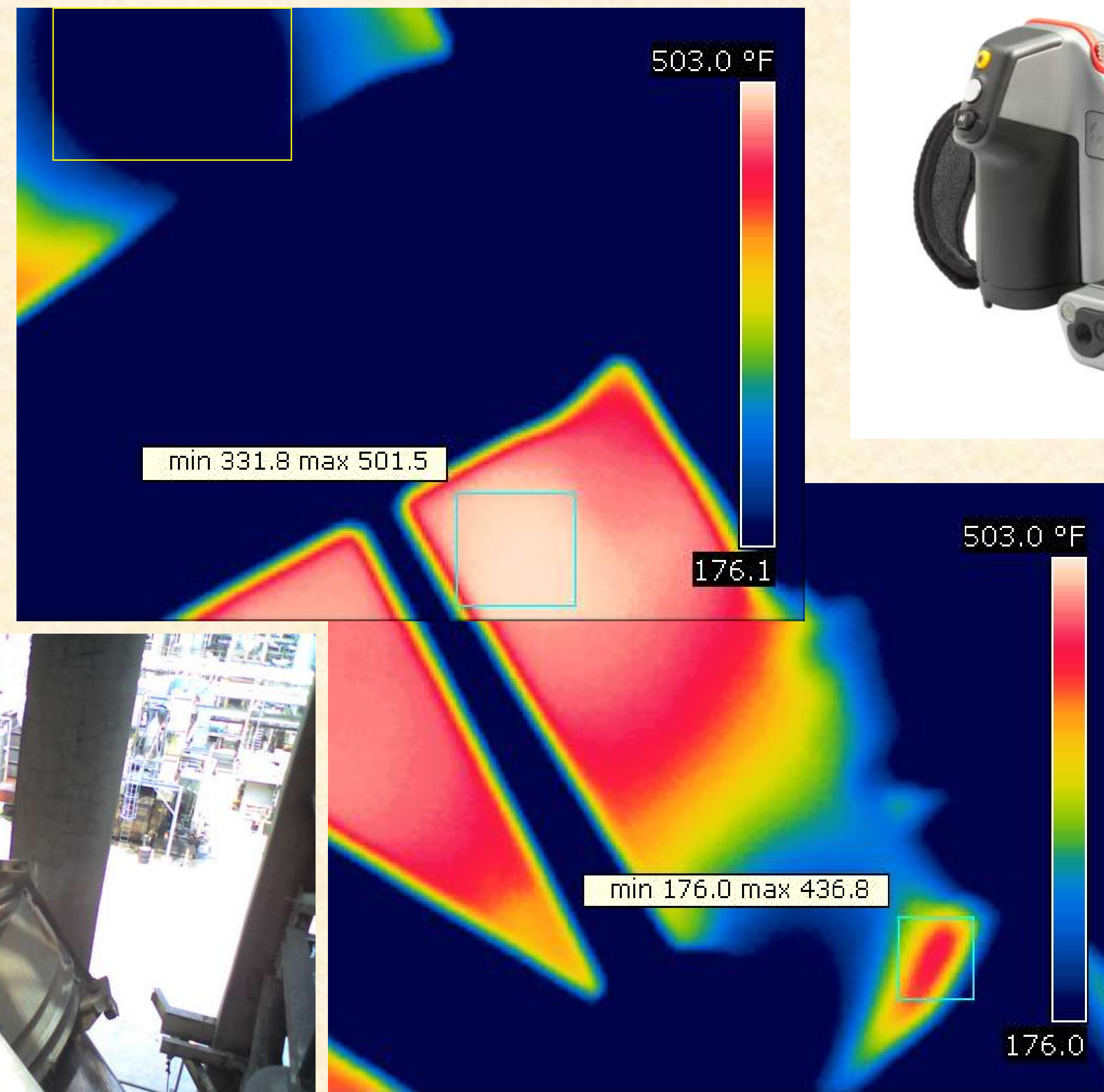


CITGO Petroleum Corporation:

Lemont Refinery

Eric Michel, Chemical Engineer Concentration
Junior at Calvin College

IR CAMERA



From Left To Right: Normal Picture Showing a water wash on a pipe from the FCC, IR picture of the same pipe, Camera that was used to take the picture



Training

This is The Refinery where I worked. The units that I worked with are on the very right side of this picture

Safety Training that I received before I was able to go into the Refinery:

Three Rivers Safety Training: Learned OSHA standards for safe work and CBL for CITGO

CBL (Computer Based Learning): Learned more about CITGO

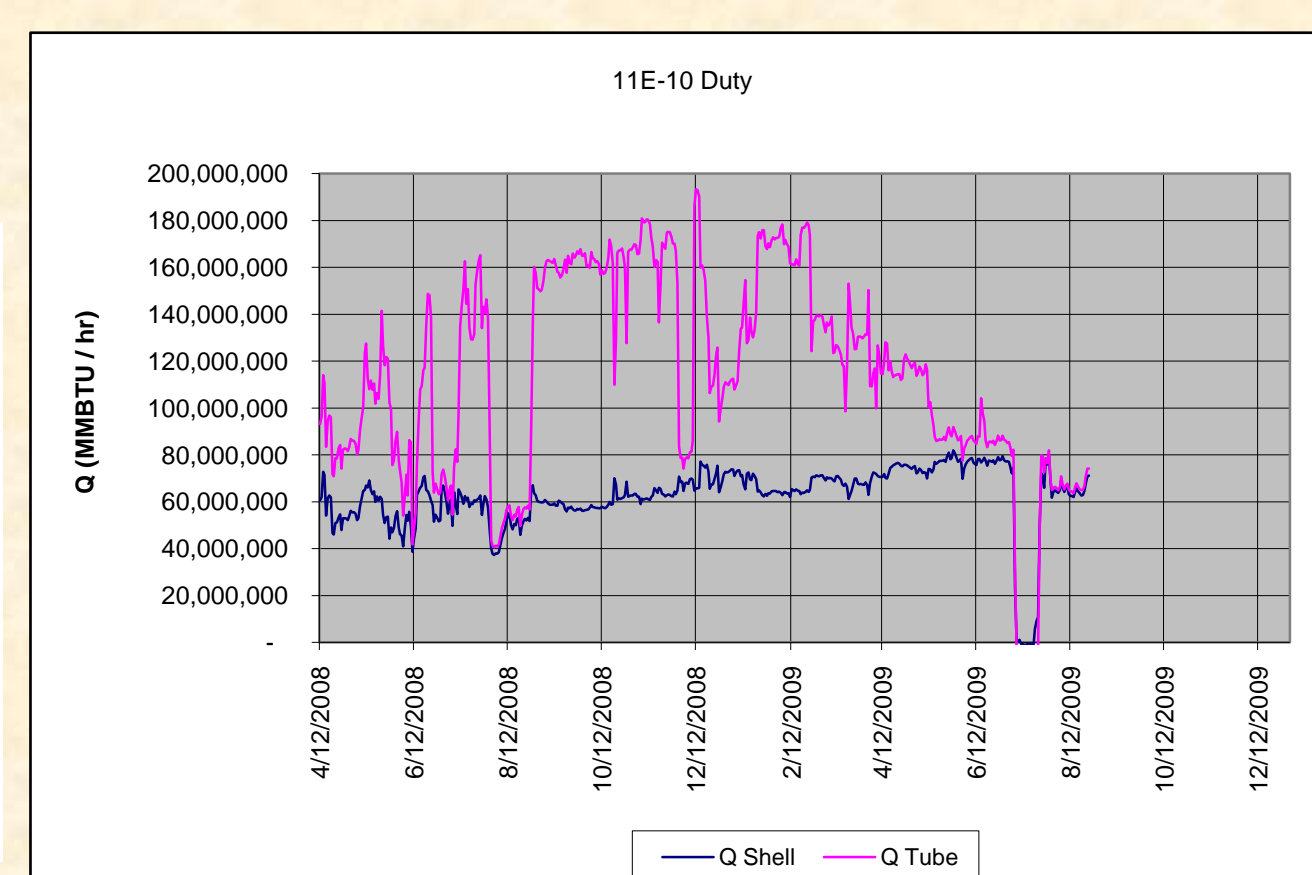
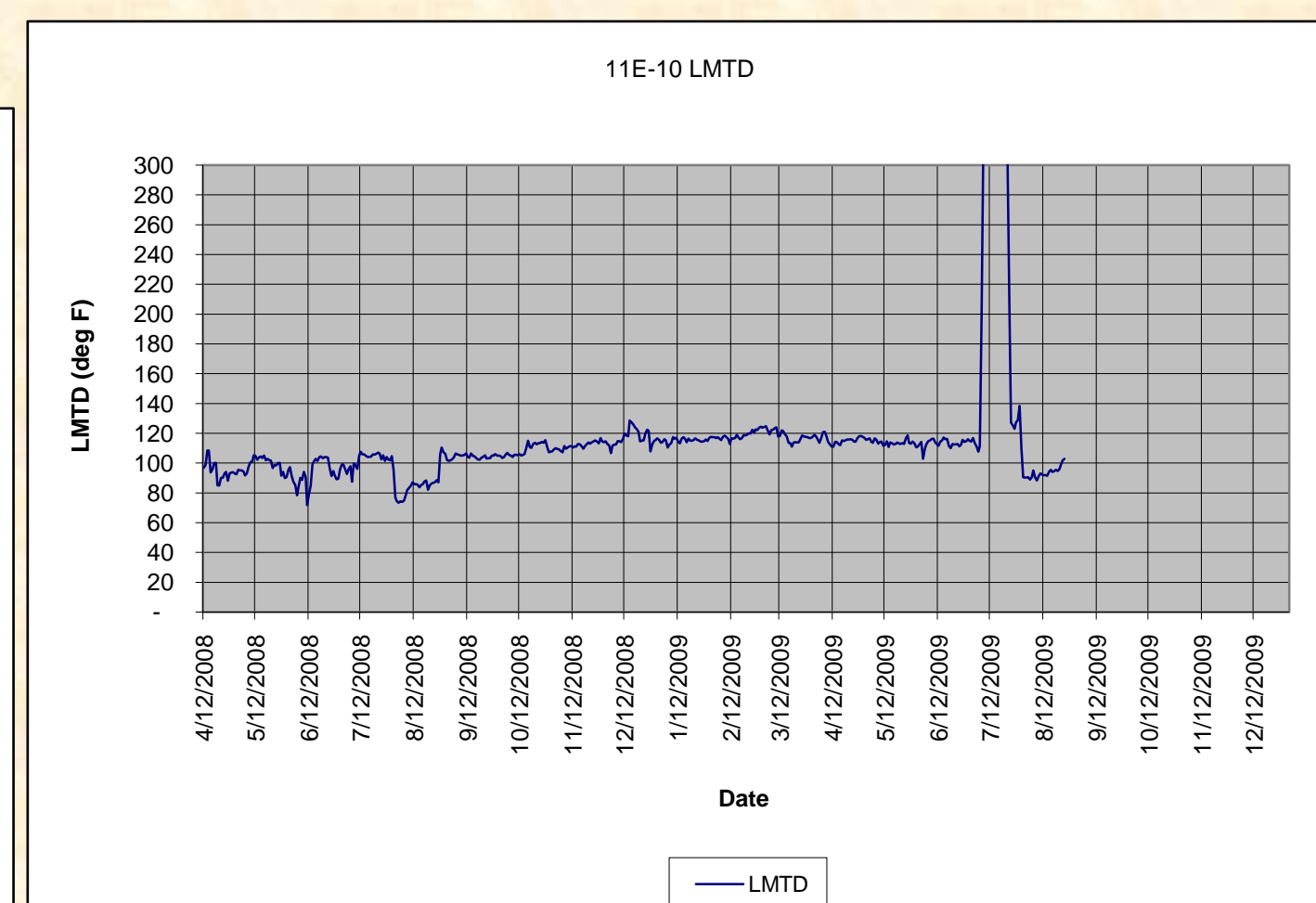
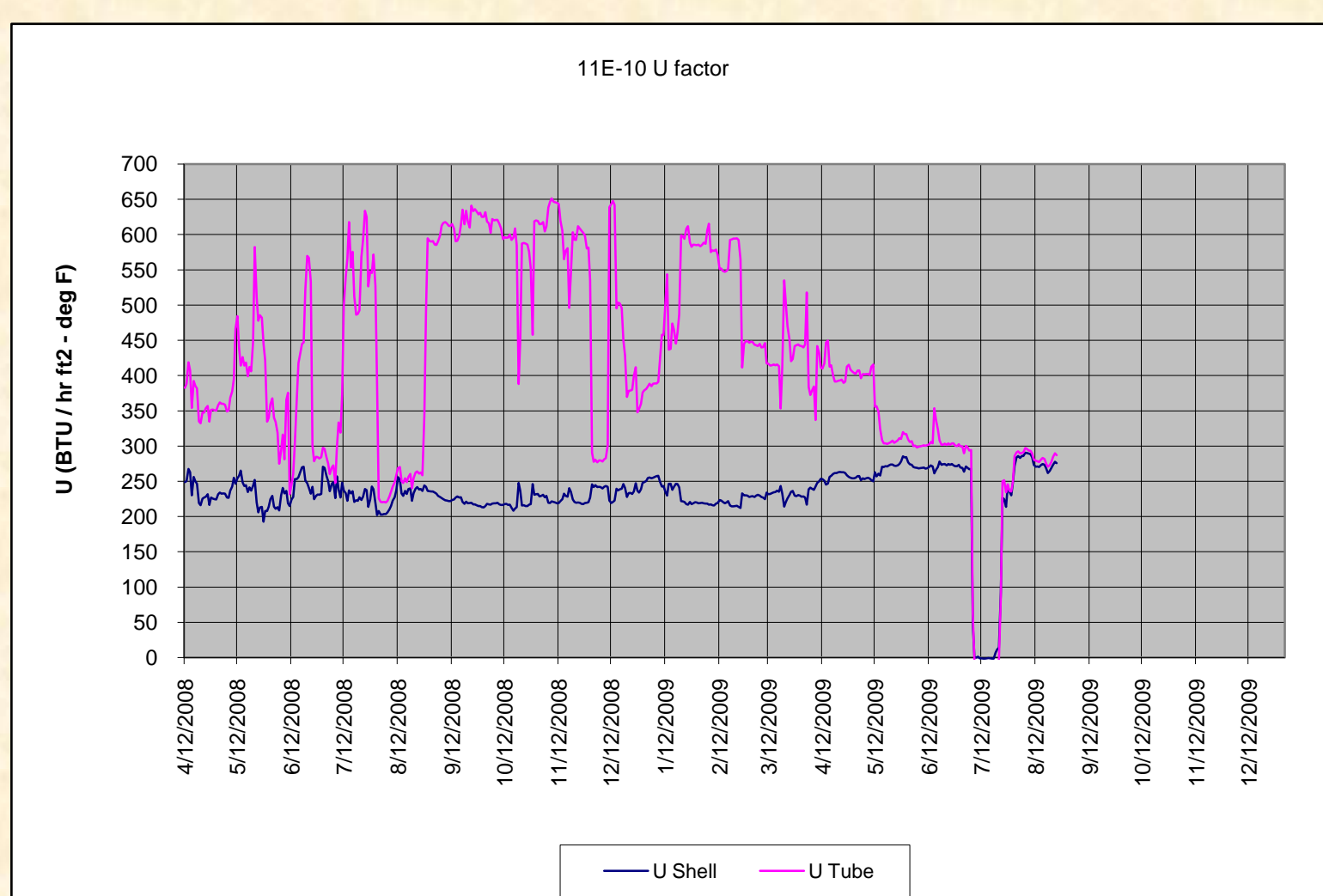
HF: Had a class on safety of dealing with Hydrofluoric Acid

Fire Training: Took a class about the levels of fire and then had a field test

Hydro Treating: Had ART come in and teach the basics of a hydro treating unit

New Hires Class: Taught the basics of the EPA and its regulations at CITGO

Relief Valves: took a class on how to size relief valves



I worked to determine the U Factor, LMTD, and the Duty on many different Heat Exchangers at the Crude Unit. This Exchanger took the crude oil coming in to the refinery and heated it up while cooling down the fuel gas oil coming from one of the gasoline hydrotreaters. In the U factor and Duty graph you can see the error that is had in calculating these factors, because the lines are supposed to be right on top of each other.

Unit 23 Flag Report								
							Data For 7/6/2009	
Description	Tag	Min	Max	Shift 1 - Midnights	Shift 2 - Days	Shift 3 - Afternoons	Min	Max
Feed Streams								
DES RECT HSR CHG, BPD	23F-1103-PV			8183.0	9113.3	9869.2	8495.5	9175.2
DES SECT MSR CHG, BPD	23F-1112-PV			5302.6	5278.4	5101.9	5097.3	5623.2
BFW TO STEAM DRUM	23F-110-PV			6.7	6.7	6.7	6.5	6.9
Product Streams								
REF TO STG U-22, BPD	23F-105-PV			9621.1	9524.2	9395.8	8712.4	11024.8
DEPNT OH LQ TO SP, BPD	23F-120-PV			1050.0	1077.0	1039.8	853.6	1119.0
ABSORBER H2 T BCT, MCFD	23F-131-PV			2298.0	2304.7	2318.6	2230.2	2376.1
ABSORBER H2 TO SP, MCFD	23F-214-PV			4540.5	4633.7	4479.1	657.9	1068.4
DEBUT OH LQ TO SP, BPD	23F-1102-PV			894.8	930.0	962.4	9180.3	9825.8
TAIL H2 TO 18-22, MCFD	23F-2105-PV			5298.7	5259.3	5402.5	4839.9	5585.8
ABS H2 TO FG, MCFD	23F-2108-PV			0.0	0.0	0.0	0.0	0.0
DESULF NAP T 18, BPD	23F-2117-PV			5067.8	5359.8	5613.8	4870.7	5155.8

I first worked on Flag Reports: which are what all the OPE's in the Refinery look at first thing in the morning. It will show them whether or not they are hitting their targets for the last 24 hours. This is about 1/10 of a full report, and only shows the inlet and outlet streams to this particular unit, which happens to be the cat reformer.



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