

Refinery Stackvision Install

Ross Meinhart

HES Professional

Environmental

romeinhart@marathonpetroleum.com

Background

- HES Professional Marathon Petroleum
 - 3 years
 - CEMS/Heaters Boiler
 - Spreadsheet World
- 13 Years Coal Fired Power Plant
 - Part 75 Boilers with Stackvision

- Old System

- Pass/Fail Email

- Pulls data from PI
 - Scroll through and look for red/green

- DCS alarms

- Operations alarm at central control room
 - Miss alarm
 - Get busy and forget about it

- Everything was run at analyzer shacks

- No remote viewing or controlling

- Old Pass/Fail Email

Flares 1/5/6 NHV	PASS	
Flares 1/5/6 Low Range H2S GC	PASS	
Flares 1/5/6 High Range H2S GC	PASS	
Flare 2 NHV	PASS	
Flare 2 Low Range H2S GC	FAILED	View Flare 2 Low Range H2S GC To Evaluate
Flare 2 High Range H2S GC	PASS	
Flare 3 NHV	PASS	
Flare 3 Low Range H2S GC	PASS	
Flare 3 High Range H2S GC	PASS	
Flare 104 NHV	PASS	
Flare 104 Low Range H2S GC	PASS	
Flare 104 High Range H2S GC	PASS	

Stackvision

- Installed Stackvision 4th quarter 2019
 - Installed on 4 refinery flare GC's
 - Bad actors of facility
 - Most downtime
 - Not much info from them
 - Limited by hard wire communication
- System fully implemented end of 1st quarter 2020
- Tied GC's into an analyzer network for remote access
 - Utilized fiber/Modbus for data
 - Remote calibrations
 - Remote CGA's
- Quickly turned into a big win for maintenance
- Data is sent to us vs. finding the data

Seeing the Data

- Daily Calibration Report

Source: F02

End Date / Time	Zero Level			Span Level			Results				Protocol Gas Details			
	Reference Value	Actual Response	Cal Error	Reference Value	Actual Response	Cal Error	Cal Limit	Error Method	Pass/Fail	On-Line	Gas Type Code	Vendor ID	Cylinder ID	Expire Date
H2SPERC														
11/02/2020 06:18				2.75	2.74	0.2	20.0	STD	Passed	Yes		NONPGV P	CC67726	01/15/22
H2SPPM														
11/02/2020 07:15	0.00	0.00	0.0				20.0	STD	Passed	Yes				
11/02/2020 08:18				248.80	277.23	9.5	20.0	STD	Passed	Yes		NONPGV P	SG9160572BA L	12/04/21
NHV_GC														
11/02/2020 06:18				614.43	597.80	2.7	20.0	STD	Passed	Yes		NONPGV P	CC67726	01/15/22

Source: F03

End Date / Time	Zero Level			Span Level			Results				Protocol Gas Details			
	Reference Value	Actual Response	Cal Error	Reference Value	Actual Response	Cal Error	Cal Limit	Error Method	Pass/Fail	On-Line	Gas Type Code	Vendor ID	Cylinder ID	Expire Date
H2SPERC														
11/02/2020 06:26				2.75	2.89	2.8	20.0	STD	Passed	Yes		NONPGV P	CC76847	01/15/22
H2SPPM														
11/02/2020 07:08	0.00	0.00	0.0				20.0	STD	Passed	Yes				
11/02/2020 08:12				248.80	256.41	2.5	20.0	STD	Passed	Yes		NONPGV P	XC025534B	12/04/21
NHV_GC														
11/02/2020 06:26				614.44	599.48	2.4	20.0	STD	Passed	Yes		NONPGV P	CC76847	01/15/22

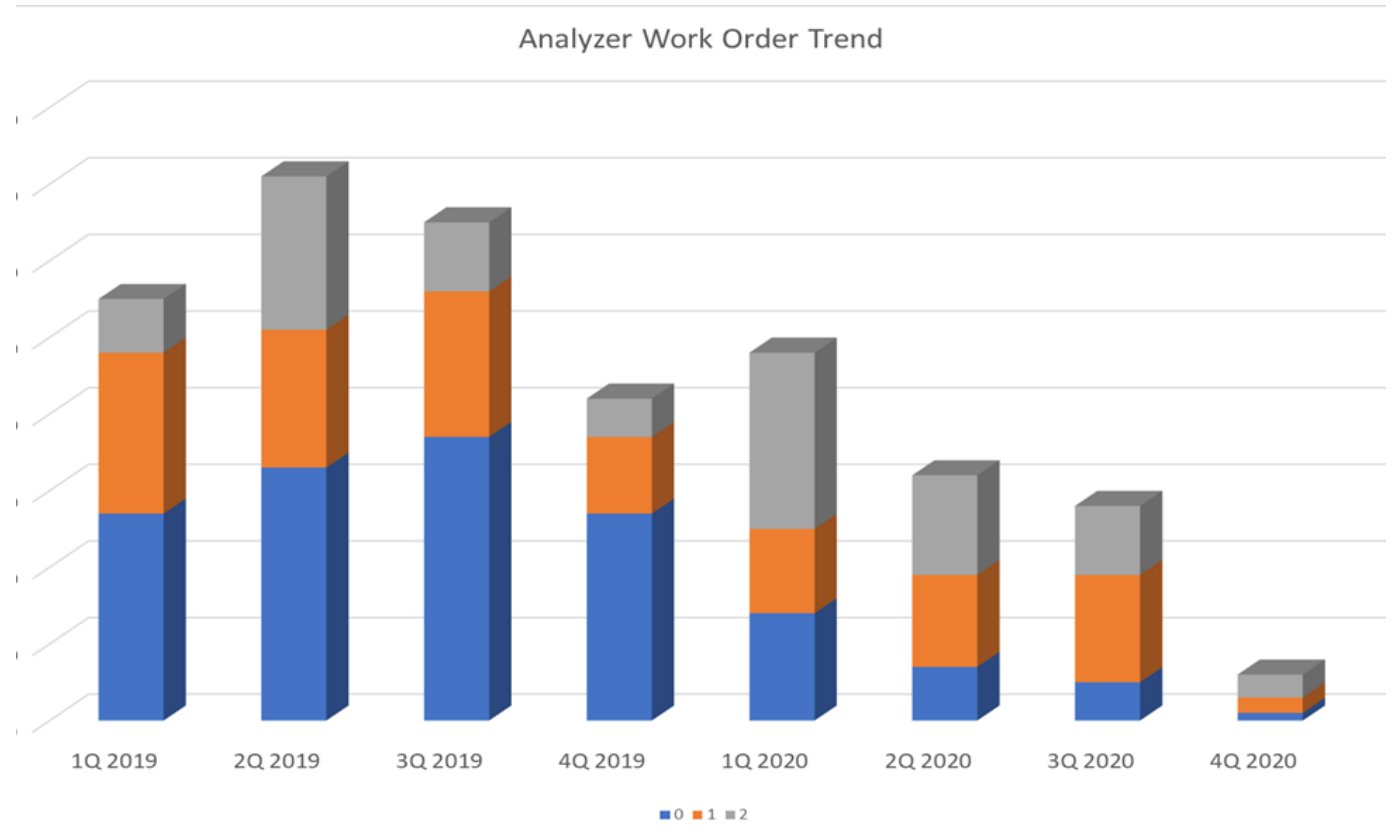
Proactive Calibrations

- Reduced GC EWO's by 50%
 - Proactive Calibrations
 - Detailed Daily Calibration Reports
 - Weekly Calibration Trends
 - Eliminated False Callouts From PI Issues
- Achievements
 - Saving Over 500 PM Man Hours Per Year
 - Reduced CGA hours by 50%
 - Automated Reporting
 - Streamlining CGA's
 - Immediate pass fail notification
 - Text alerts



Cost Benefits

- **50% Reduction in Analyzer Emergency Work Orders**
 - ✓ Average EWO Cost = \$1,000
 - ✓ 71 Less EWOs
 - ✓ Cost savings of \$71,000
- **43% Reduction in Overall Analyzer Work Orders**
 - ✓ Average WO Cost = \$2,500
 - ✓ 83 Less WOs
 - ✓ Cost Savings of \$207,500

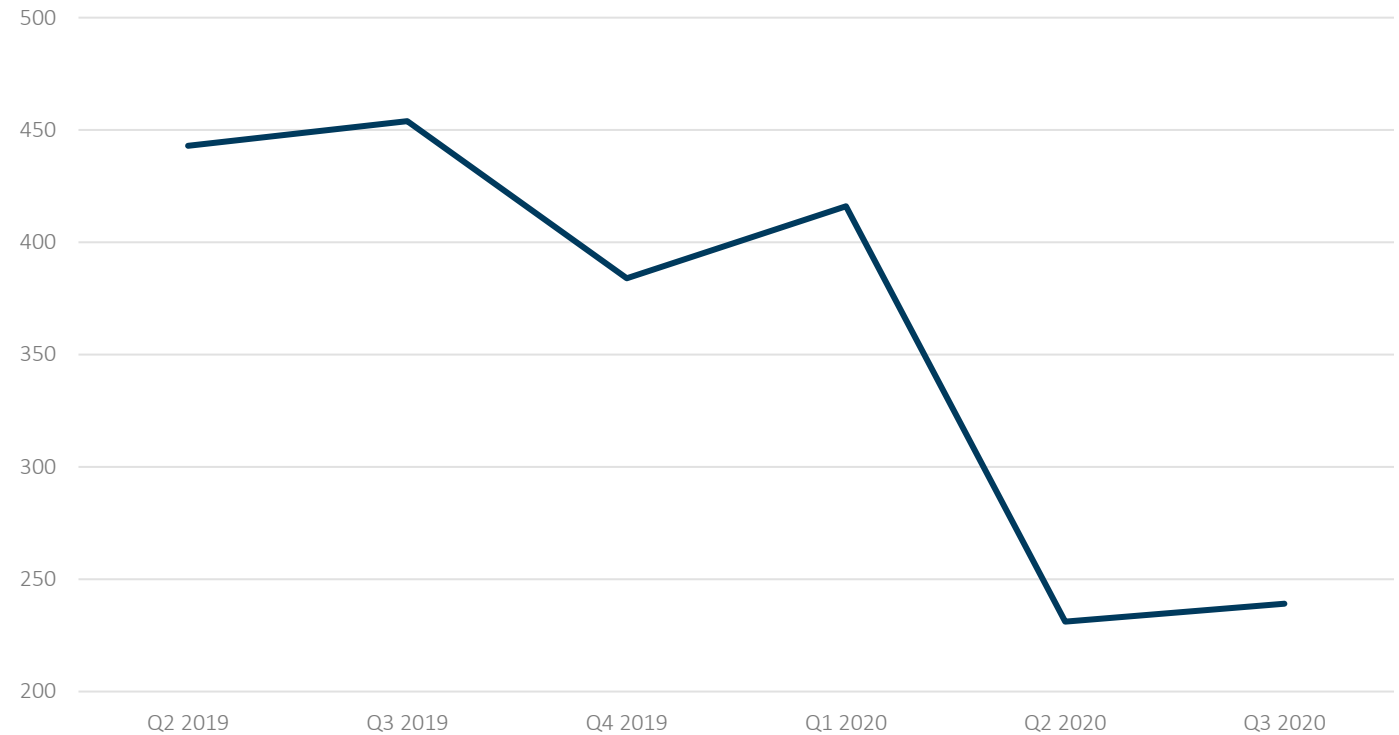


Cost Benefits

- **Compare 2019 to 2020**

- ✓ 48% Reduction in CEM Downtime
- ✓ 83% Reduction in Unscheduled CEM Downtime

CEM Downtime Hours



Moving Forward

- Detailed Component Report
- Started report 4 weeks ago
- Validate on Total BTU
 - Breaking down to individual components before BTU drifts
- Nobody has seen this on a daily basis
- Project Submitted for complete refinery install
 - ROI=50%

Source Parameter Unit	F03								
	ETHAN_21 (MOL_PERC)	H2SMOL21 (MOL_PERC)	HYDRO_21 (MOL_PERC)	METHA_21 (MOL_PERC)	NBUTA_21 (MOL_PERC)	NHV_21 (BTU/SCF)	NITRO_21 (MOL_PERC)	NPENT_21 (MOL_PERC)	PROPA_21 (MOL_PERC)
10/27/20 06:00	5.15	2.84	30.89	40.97	0.53	598.86	19.69	0.52	2.07
10/27/20 06:01	5.15	2.84	30.89	40.97	0.53	598.86	19.69	0.52	2.07
10/27/20 06:02	5.15	2.84	30.89	40.97	0.53	598.86	19.69	0.52	2.07
10/27/20 06:03	5.15	2.84	30.89	40.97	0.53	598.86	19.69	0.52	2.07
10/27/20 06:04	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:05	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:06	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:07	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:08	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:09	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:10	5.15	2.84IC	30.89	40.97	0.53	598.86IC	19.69	0.52	2.07
10/27/20 06:11	5.12	2.80IC	30.68	40.73	0.09	535.13IC	19.63	0.09	0.34
10/27/20 06:12	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:13	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:14	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:15	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:16	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:17	5.11	2.80IC	30.64	40.68	0.00	535.13IC	19.62	0.00	0.00
10/27/20 06:18	5.14	2.83IC	30.85	40.93	0.34	577.15IC	19.69	0.34	1.38
10/27/20 06:19	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:20	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:21	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:22	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:23	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:24	5.16	2.84IC	30.95	41.05	0.52	598.16IC	19.73	0.51	2.07
10/27/20 06:25	5.15	2.83IC	30.91	40.99	0.52	598.31IC	19.69	0.51	2.07
10/27/20 06:26	5.14	2.83IC	30.88	40.95	0.52	598.31IC	19.68	0.51	2.07