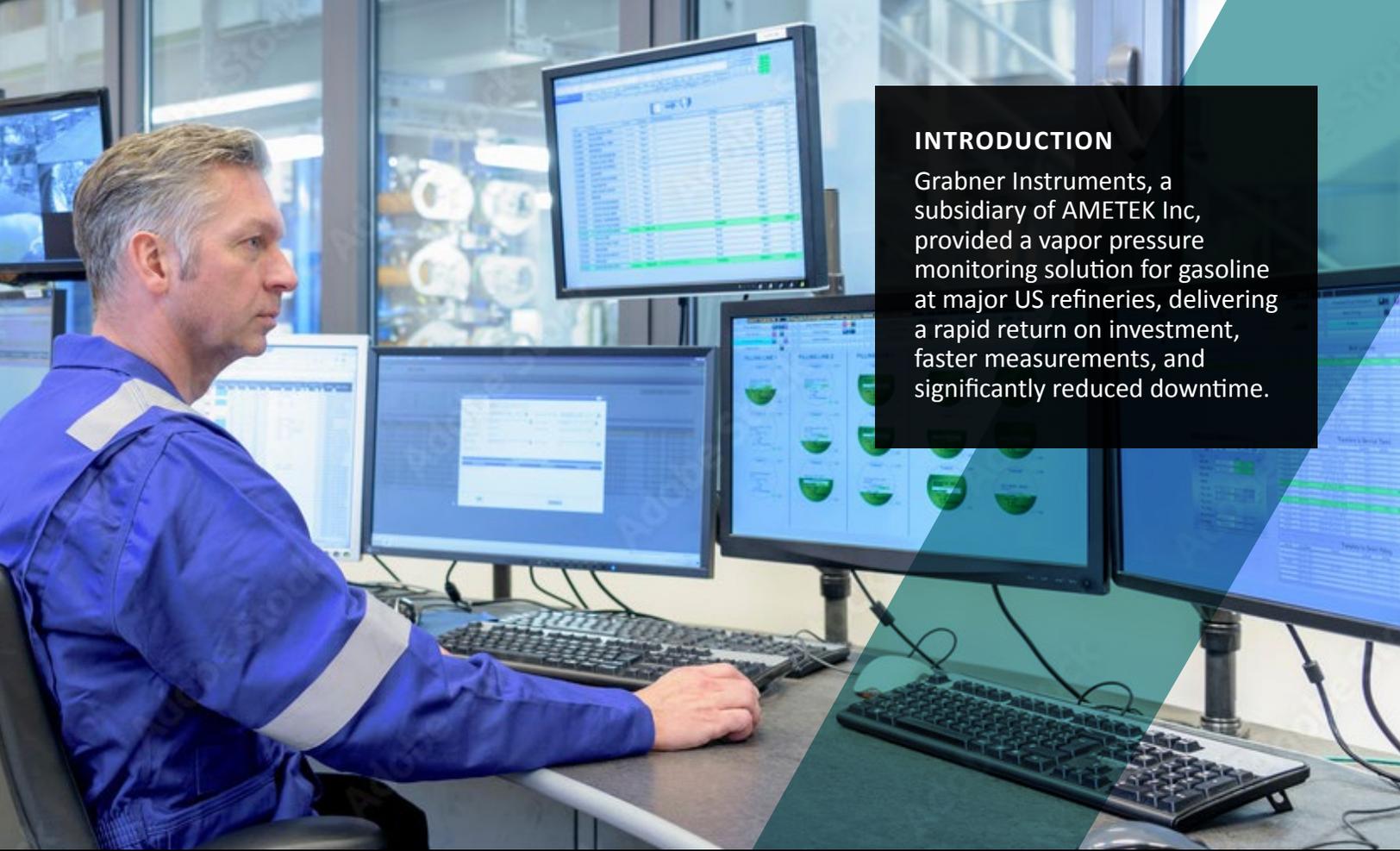




A highly profitable solution for **reducing vapor pressure giveaway** for a group of major US refineries.



INTRODUCTION

Grabner Instruments, a subsidiary of AMETEK Inc, provided a vapor pressure monitoring solution for gasoline at major US refineries, delivering a rapid return on investment, faster measurements, and significantly reduced downtime.

THE CHALLENGE

A major petroleum company in North America needed to blend gasoline, gasoline components, and additives without exceeding the vapor pressure limits, which are set regionally by the US Environmental Protection Agency (EPA).

Non-compliance can lead to heavy financial penalties, so the ability to receive precise, accurate, and reliable vapor pressure results, just downstream of the blend header, is essential.

Operators also have to consider the 'giveaway' – the delta between the vapor pressure of the finished product and the set vapor pressure limit. Just a couple of tenths of psi can equate to added costs of millions of dollars annually, since producers could expand their product volume by blending less-expensive components such as butane to increase the vapor pressure closer to the limit.

The refinery used non-AMETEK analyzers which had reached their end of life and were no longer supported by the supplier. Moreover, the method used for certifying gasoline took approximately fifteen minutes to complete.

Obtaining faster results – closer to 'real-time' – would enable operators to adjust process controls in response to vapor pressure results, which would allow 'tighter' blending.

The refinery operators were looking for a robust, on-line vapor pressure analysis solution that had the precision and accuracy demanded by the mandated vapor pressure methods, but with faster results.

Additionally, the new analyzer had to be easy to maintain, with a rapid return on investment (ROI), low cost of ownership, and near-zero downtime.



Central
controller
option



THE SOLUTION

The refinery operators approached Grabner Instruments based on a number of factors. Brand recognition was key – Grabner Instruments’ benchtop vapor pressure analyzers have been the standard in vapor pressure measurement for decades.

In addition, Grabner Instruments could deliver precise, reliable results certified by a benchtop laboratory analyzer.

For this application, Grabner Instruments developed a ‘double’ version of its VPSO (Vapor Pressure System Online) VPSOD, with two measuring cabinets fitted on a single frame.

The measurements within each cabinet are triggered 50% out of phase with the other, which reduces the result interval from seven minutes to approximately 3.5 minutes. This analyzer possesses best-in-class precision and a quick-change measuring cell that practically eliminates downtime (less than five minutes) in the event of failure.

The first installation was carried out at a plant in California. Eight VPSOD systems have since been installed across a number of midstream locations, with some locations having two units. Retrofit projects are ongoing, and with additional plans to implement this successful vapor pressure monitoring solution at further critical sites.

	Butane	Gasoline
RVP Observed (psi)	52	8.5
Cost (dollars/gallon)	1.13	2.45
Barrel Volume (bbl)	2800	400000
percent	0.70%	99.30%
Analyzer Precision (psi)	.04	
Expected RVP (psi):	8.99	
Euros per Dollar	0.7338	
	<input type="radio"/> US <input type="radio"/> EU	
Calculations		
Cost of Butane:	\$132,888	
Total Revenue:	\$288,120	
Gross Profit:	\$155,232	
Expected Cost (dollars/gallon):	\$2.441/gal	

Calculate cost savings for on-line vapor pressure testing.

<https://www.grabner-instruments.com/vpsocalculator>

THE RESULTS

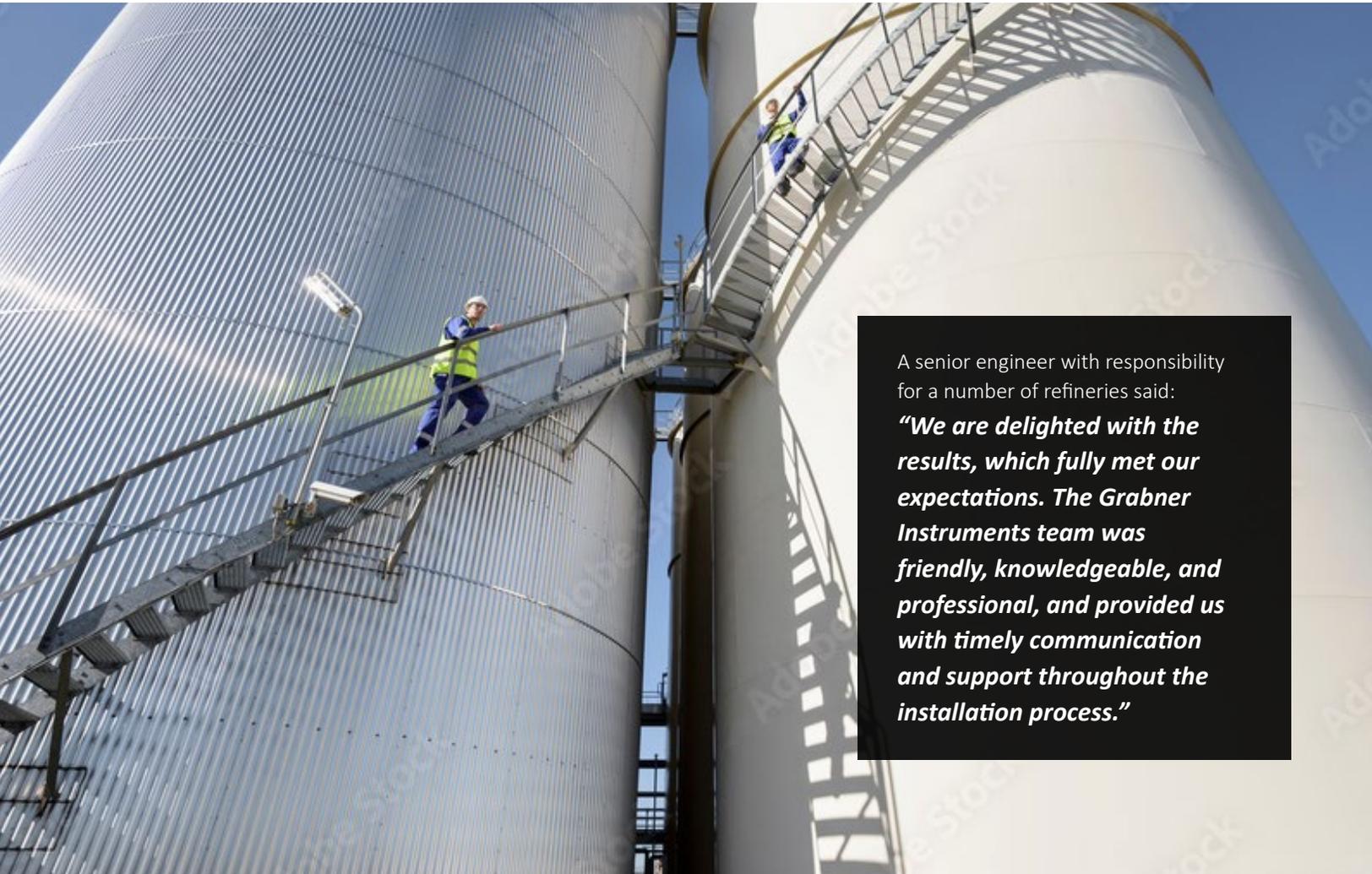
With installation complete, all refineries with the new equipment are running successfully, resulting in more profitable and reliable gasoline-blending operations.

The VPSOD system has led to operators being able to capture faster ROI – sometimes within just a couple of tank-blends – and millions of dollars in annual revenue across their sites.

The double-cabinet design not only lowers the measuring interval, but allows the customer to run different methods on up

to six measurement channels for seasonal specifications (for example, vapor lock in the summer), so they can satisfy more than one volatility specification with a single unit.

In addition, the quick-change measuring cell has practically eliminated downtime, while the redundancy of having two measuring cabinets ensures continued uptime in case of a cabinet failure that can't be resolved promptly.



A senior engineer with responsibility for a number of refineries said:

“We are delighted with the results, which fully met our expectations. The Grabner Instruments team was friendly, knowledgeable, and professional, and provided us with timely communication and support throughout the installation process.”

Explore further analytical solutions at:
www.grabner-instruments.com and www.petrolab.com

