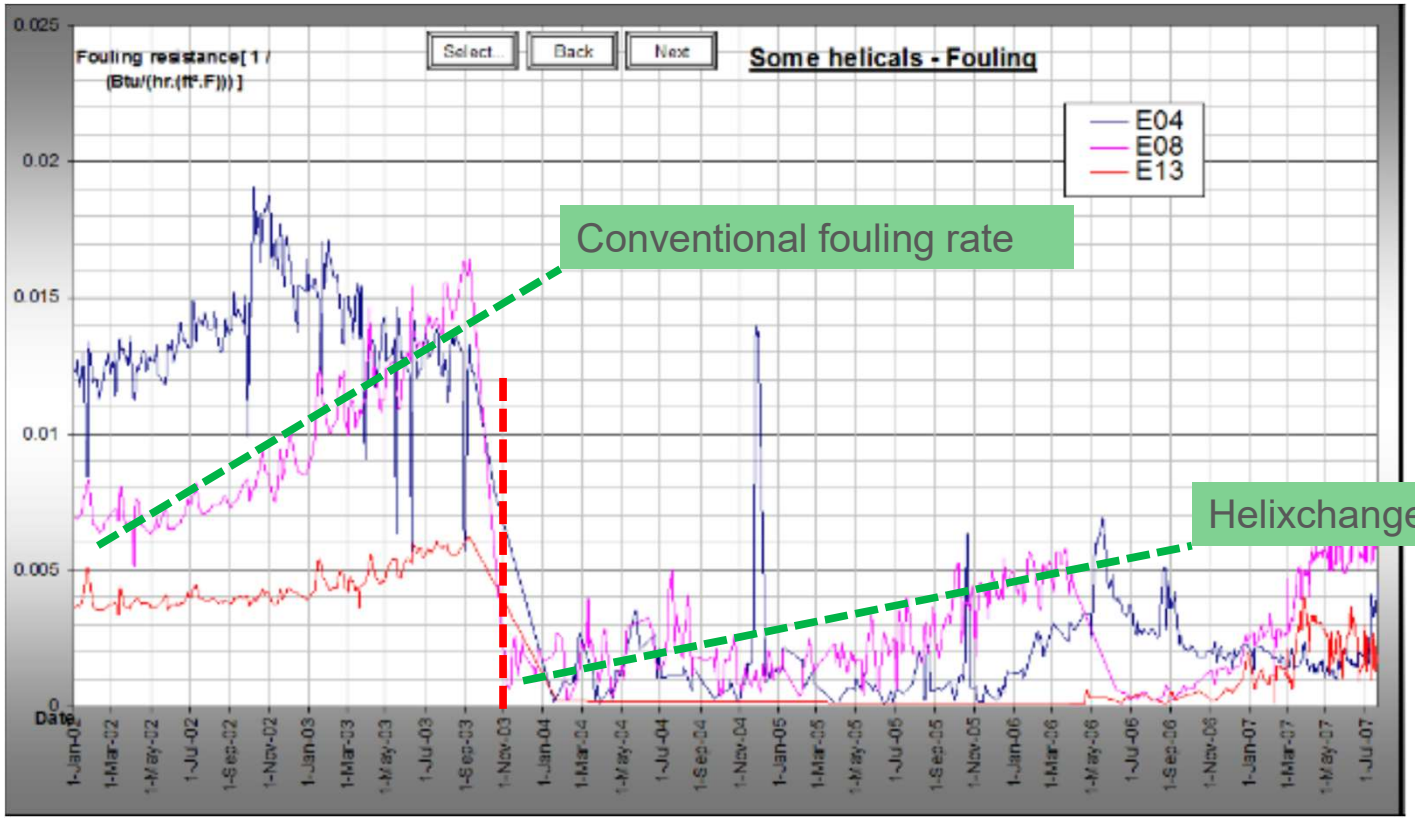
Case study: Bundle swap in crude unit

LUMMUS TECHNOLOGY

Gulf Coast



Case Study – Vacuum Residue

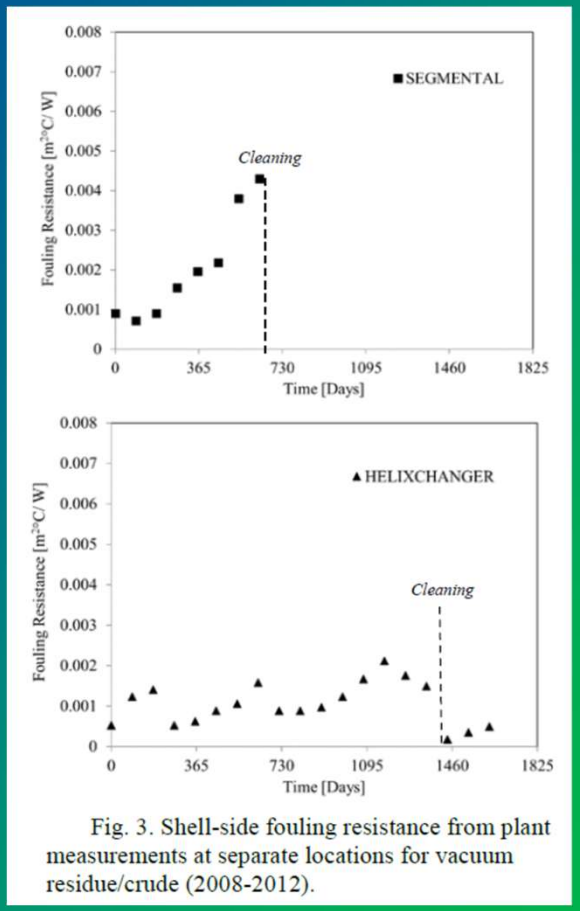


Fig. 3. Shell-side fouling resistance from plant measurements at separate locations for vacuum residue/crude (2008-2012).

Service: Vacuum residue/desalted crude heat exchanger

Problem:

- ✓ Highest fouling in the unit
- ✓ Cleaning required every 2 years
- ✓ Heat recovery below design after 3-6 months

Solution:

- ✓ replacement with HELIXCHANGER®
- ✓ Vacuum Residue on shell-side to minimize piping changes

Cleaning cost saving equivalent to one new bundle cost

Case Study - Bina Refinery – New Coker

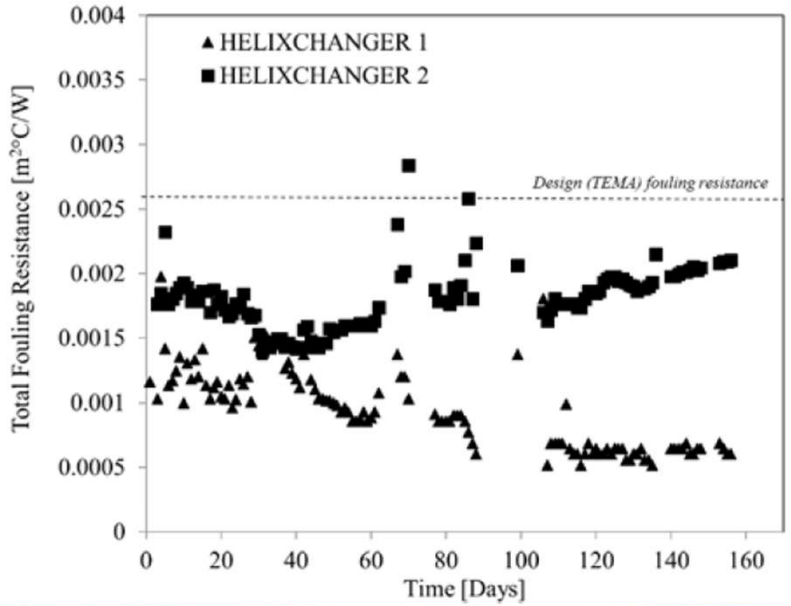
2 x Vac Resid (Shell Side) HCGO (Tube Side)

Fouling factor 0.0026 m2°C/W

Design Basis : 392 to 650 °F (11.6 MW)

Current : 330 to 650°F (16.2 MW)

39.65% Higher Duty



Case Story - Sohar Refinery

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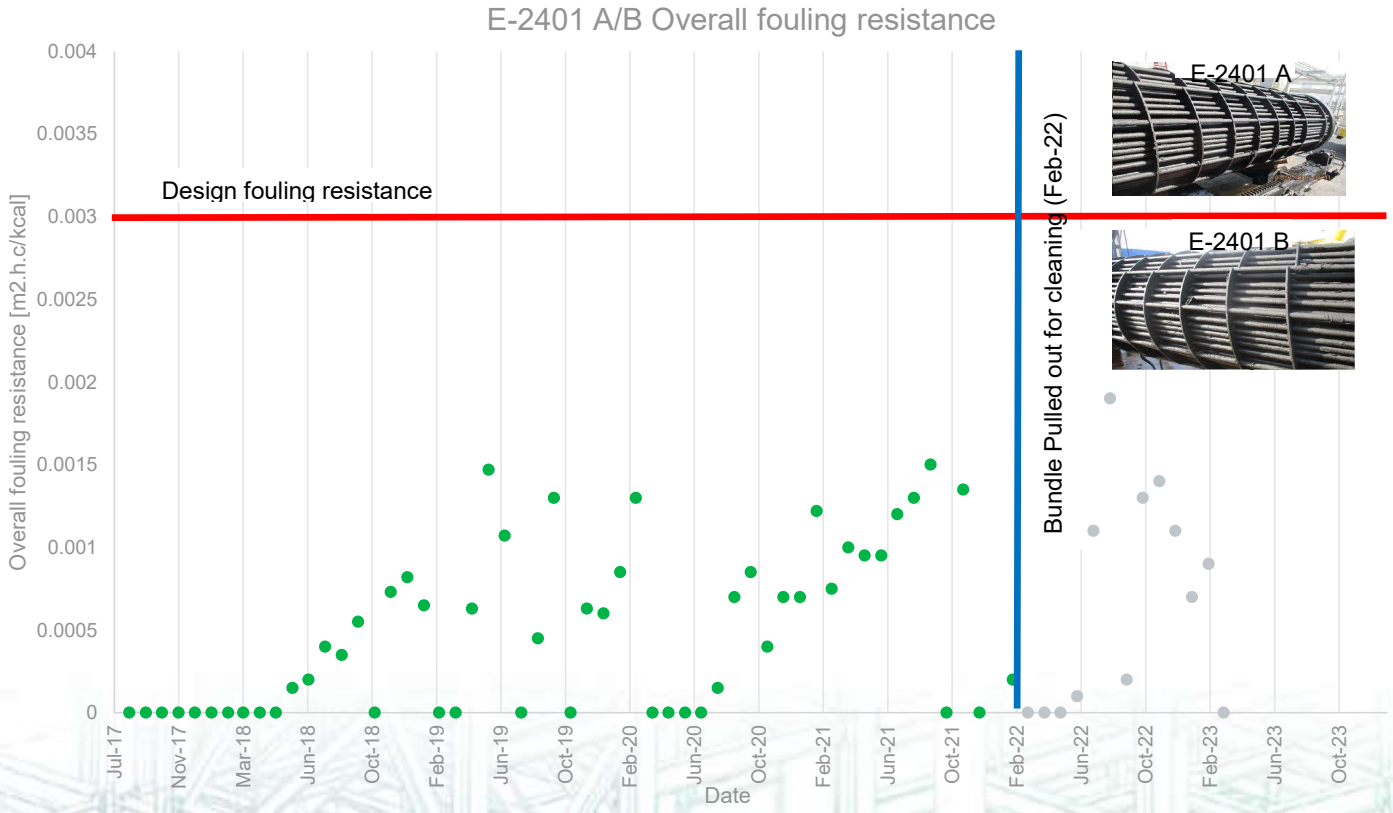


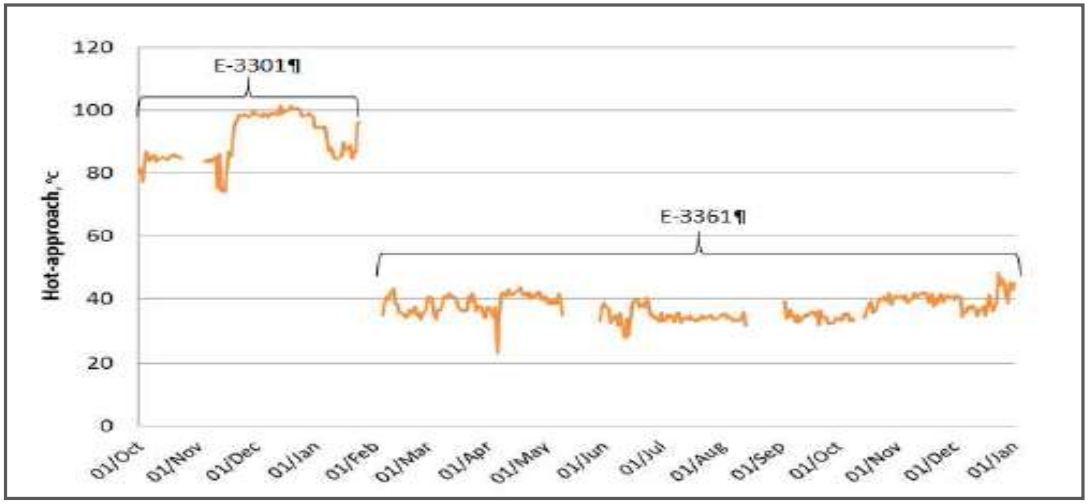
HELITOWER™ Case Study – Portugal Refinery

Problem: Large hot-approach temperature (HEA) in Texas Tower, E-3301, resulting in decreased energy efficiency of CCR Platformer. In the unit upgrade client wanted a technology that could guarantee a lower T approach

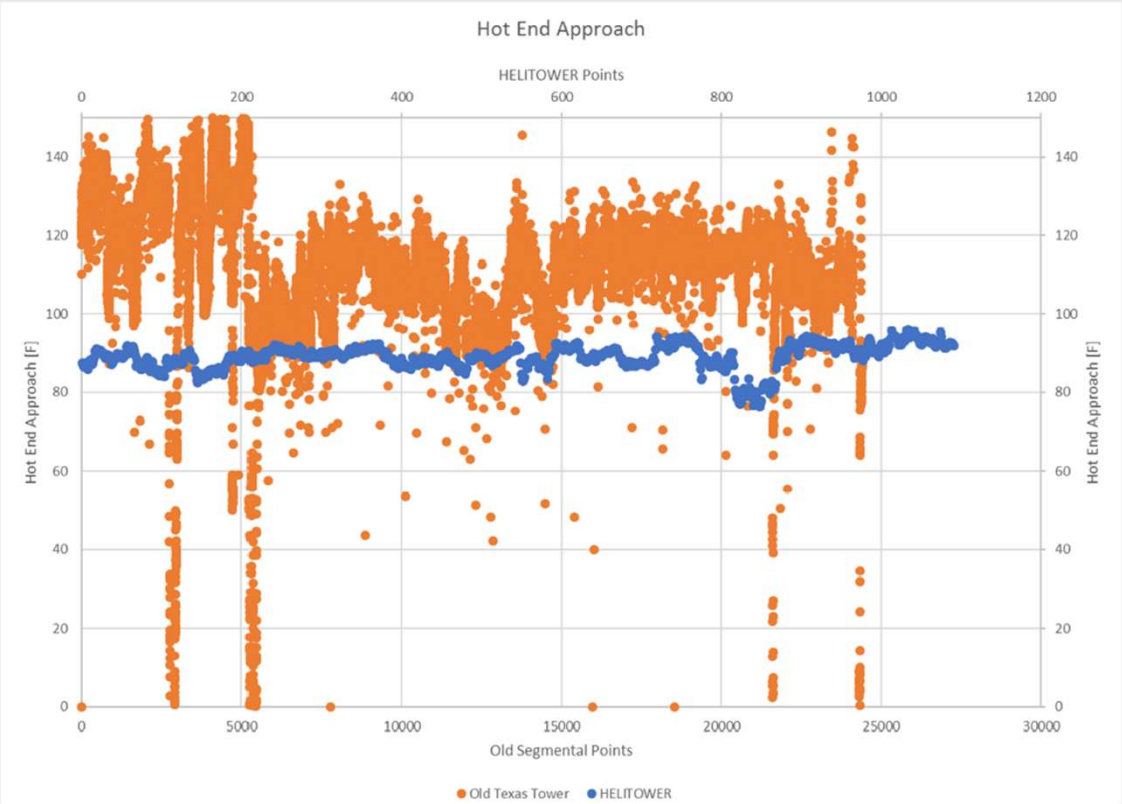
Solution: The Texas Tower was replaced with HELITOWER, E-3361, targeting a 35-40°C HEA

Results:

- **8 MM BTU/HR of energy savings**
- **HEA of 40C was achieved and maintained**



HELITOWER™– Shell Sarnia



		Old Texas tower	New HELITOWER
Data point		21-JUN-17 15:18:00	6/28/18 12:00 AM
Flow rate	BPD	12,268	12,501
	lb/hr	134,891	137,455
Feed in	F	133.40	133.50
Effluent in	F	911.73	908.20
Feed out	F	795.60	819.98
Effluent out	F	237.00	217.10
MTD	F	94.00	73.60
Hot end approach	F	116.13	88.22
Average duty	MMBtu/hr	78.50	82.68