



CRUDE AND VACUUM DISTILLATION EXPERIENCE

Apex E&M as a team has more than 200 years of combined experience over the past 40+ years in design, operation, maintenance, and troubleshooting of crude and vacuum distillation units. Our team of engineers and operators has experience founded solidly in field application just as firmly as in technical theory. This list only includes project and study related events. Not included are the numerous troubleshooting or operational activities that occur as a part of operating and maintaining a unit.

Timeframe	Location	Unit(s)	Activity
1980s	East Coast	Vac	Tower replacement and inspection of two vac towers
1990s	West Coast	Crude / Vac	Crude tower PA packing, vac tower full internals redesign
2000s	Gulf Coast	Crude / Vac	Full internals design for two ~250 MBPD crude and vac trains
2000s	Midwest	Crude / Vac	Front end design for proposed unit expansion
2010s	Gulf Coast	Crude / Vac	Restart of resid HT crude/ vac units. Redesign of vac wash section, spray headers
2010s	Gulf Coast	Crude	Workshops – optimize stripping steam on side strippers
2010s	Midwest	Crude / Vac	Design new vac tower for diesel recovery
2010s	Midwest	Vac	Modification of ejector system
2010s	Midwest	Crude	RCFA for tower corrosion issues
2010s	EU	Vac	Design review for new vac tower and overhead system
2010s	Midwest	Crude/Vac	Redesign and upgrade of crude and vacuum furnaces
2010s	Midwest	Crude / Vac	Redesign towers for high TAN service operation. Full replacement of vac internals
2010s	Midwest	Crude	RCFA for tower corrosion failures
2010s	Midwest	Vac	Redesign stripping steam system to prevent resid backflow on high level trips
2010s	Midwest	Crude/Vac	Maximize crude rate based on relief capacity and crude slate. 280-> 320 MBPD increase.
2010s	West Coast	Vacuum Diesel Frac	Replace trays with packing. Increased on-spec recovery by 50%, increasing vac capacity.
2010s	West Coast	Vac	Design new vacuum tower for hydrocracker enhanced diesel recovery
2010s	West Coast	Vac	Design of bottom boot quench / heat recovery system
2010's	Midwest	Crude	Redesign of crude furnace to reduce pressure drop issues
2010s	West Coast	Crude	Redesign lower side draw for overflash and product draw control
2010s	Midwest	Vac	Redesign of vac internals to reduce dP and optimize recovery
2010s	Australia	Vac	Internals redesign – Trayed lube tower to packed design
2010s	Midwest	Vac	Redesign of vac furnace to address reradiation issues
2010s	Australia	Crude	Workshop - Crude condenser and preheat train modifications to reduce fouling
2020s	Midwest	Crude	Pump around draw redesign
2020s	Midwest	Crude	RCFA for tower instability
2020s	Gulf Coast	Crude	Flash Drum troubleshooting