

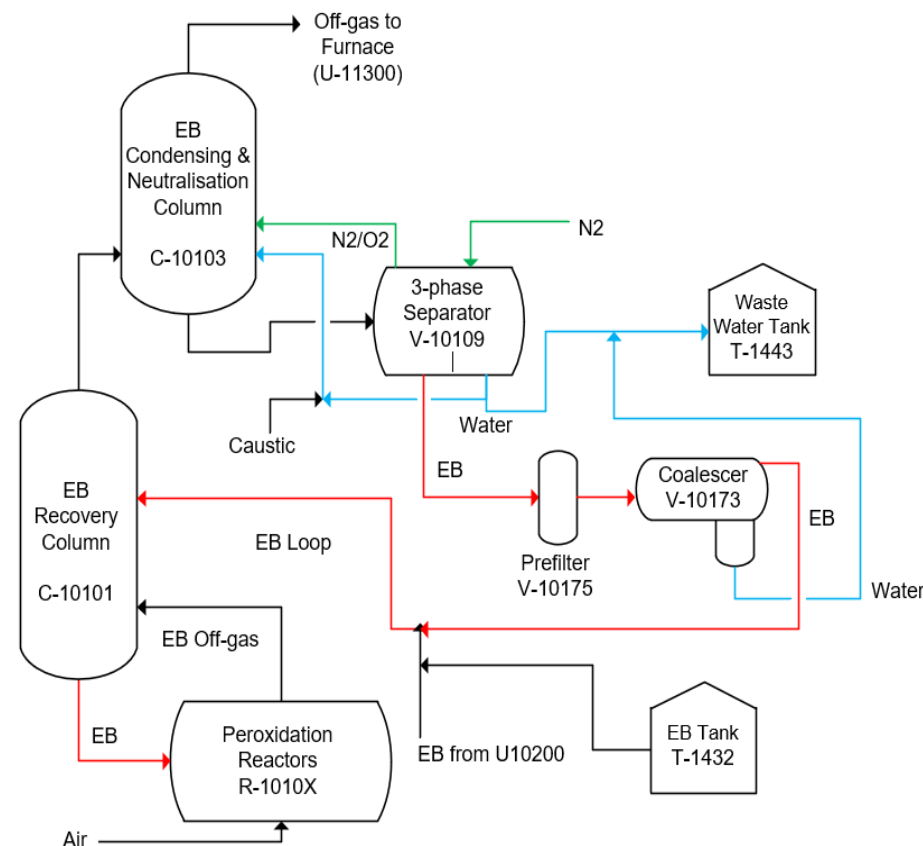
V10173 – Poor Sodium Removal Efficiency

Background and Timeline:

- V-10173 pall coalescer system was installed in 2014 to remove entrainment of salts in recycle EB from V-10109.
- High sodium observed at V-10173 inlet/outlet based on samples taken after S2 TA with V-10109 3-phase separator installation (0-350ppm vs <10ppm past data).
- The coalescer elements were replaced like-for-like on 4 Oct 2021 after 7 years of run. It was also delayed by another 6 months due to the late arrival of Kalrez O-ring. Vendor recommended < 2 years.
- High sodium continued to be observed at V-10173 outlet based on samples taken after coalescer was changed out (150 ppm vs <10 ppm past data).

Risks of Sodium Carryover:

- C-10101 tray fouling leading to high PD which could limit total offgas flow and more prone to trigger L2 trip (throughput impact).
- R-1010X air sparger fouling leading to limitation in air flow. This could impact reactor selectivity leading to lower production and yield (throughput impact).



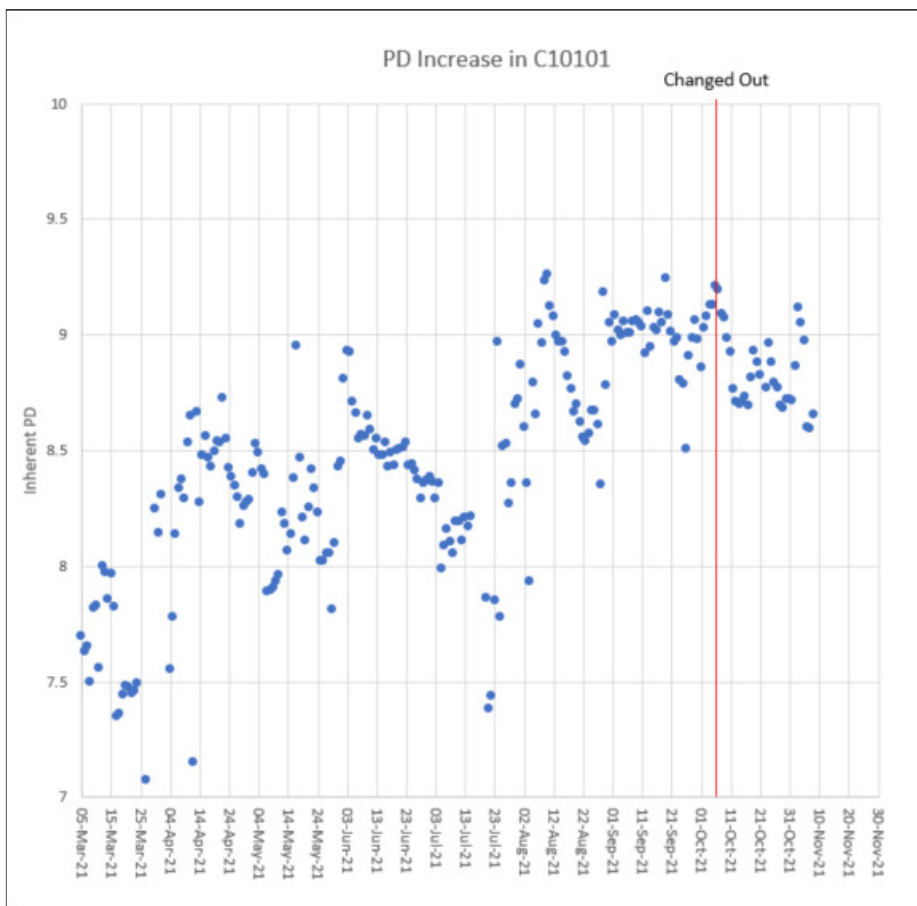
Hypothesis:

- High sodium carryover from V-10109 and lower sodium extraction from organic to aqueous phase as a result of V-10109 3 phase separator installation (0-350ppm vs <10ppm past data). Due to change from 2-phase to 3-phase separator operation, there is reduced liquid volume and lower residence time for effective separation.
- The new coalescers is not working as intended (defects) / installation error of the O-ring causing water bypass within the coalescers.

Way Forward:

- Operation handles:
 - Lower caustic recycle flow (101FC030) to increase residence time in V-10109. (Reduced to 365t/h, low alarm at 360t/h)
 - Review 101LCS030 controller mode to determine if auto control or on-off switch is a better control strategy to prevent sodium carryover.
 - Add CCC to BC10103-V10109 loop for effective sodium removal from organic to aqueous phase. (Test run completed)
- Monitoring Parameters:
 - C-10101 PD (Operating = 67 mbar, HH = 100 mbar)
 - R-1010X air sparger opening – To activate online sparger cleaning if necessary.
 - V-10173 inlet/outlet sodium sampling – To increase sample frequency temporary.
 - Monitor for another month – coalescer take some time to achieve optimal performance (e.g. wash train coalescers)
- Determine if the lower sodium removal efficiency is due to issues with the new coalescer elements or higher sodium carryover at V10109 outlet (engage both P&T and vendor).
- MOC to add CCC at V10109 EB outlet to enhance extraction of salt from the organic phase.

Normalised PD Trends and Samples



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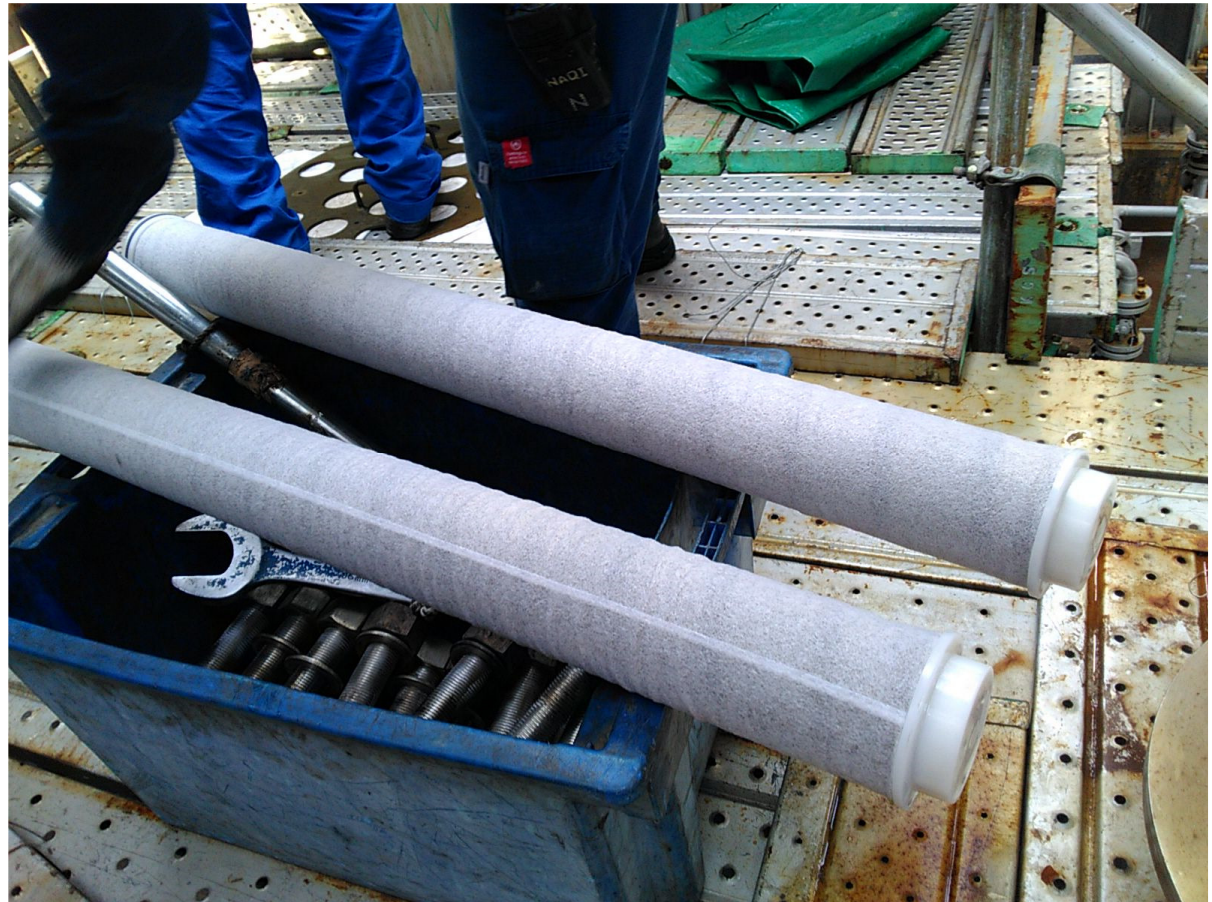
		101SPD012 V10173 inlet	101SPF001 V10173 outlet	% Removal (assume wrong)	Recirculation Rate
	Previous Data at comparable pH	2.7	<0.1	96%	400
After S2 TA	12/5 11am	1.61	0.45	72.1%	400
	12/5 5pm	28.2	17.8	36.9%	380
	17/5 11am	55.07	31.12	44.5%	370
	18/5 5pm	180.32	17.51	92.3%	360
	23/5 12PM	0.25	27.45	(99%)	360
After V10173 Replacement	6/10 1PM	353.2	10172.6	(27%)	370
	7/10 3PM	252.5	4162.3	(15%)	370
	08/10 4PM	115.1	160.0	(0.4%)	370
	13/10 11AM	325.9	156.8	51.89%	370
	20/10 11AM	45.2	26.4	41.59%	365
2t/h CCC Test Run	22/10 11AM	38.7	9.1	76.5%	365
	2/11 10AM	121.5	17.7	85.4%	365

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6

Old Elements



Old VS New



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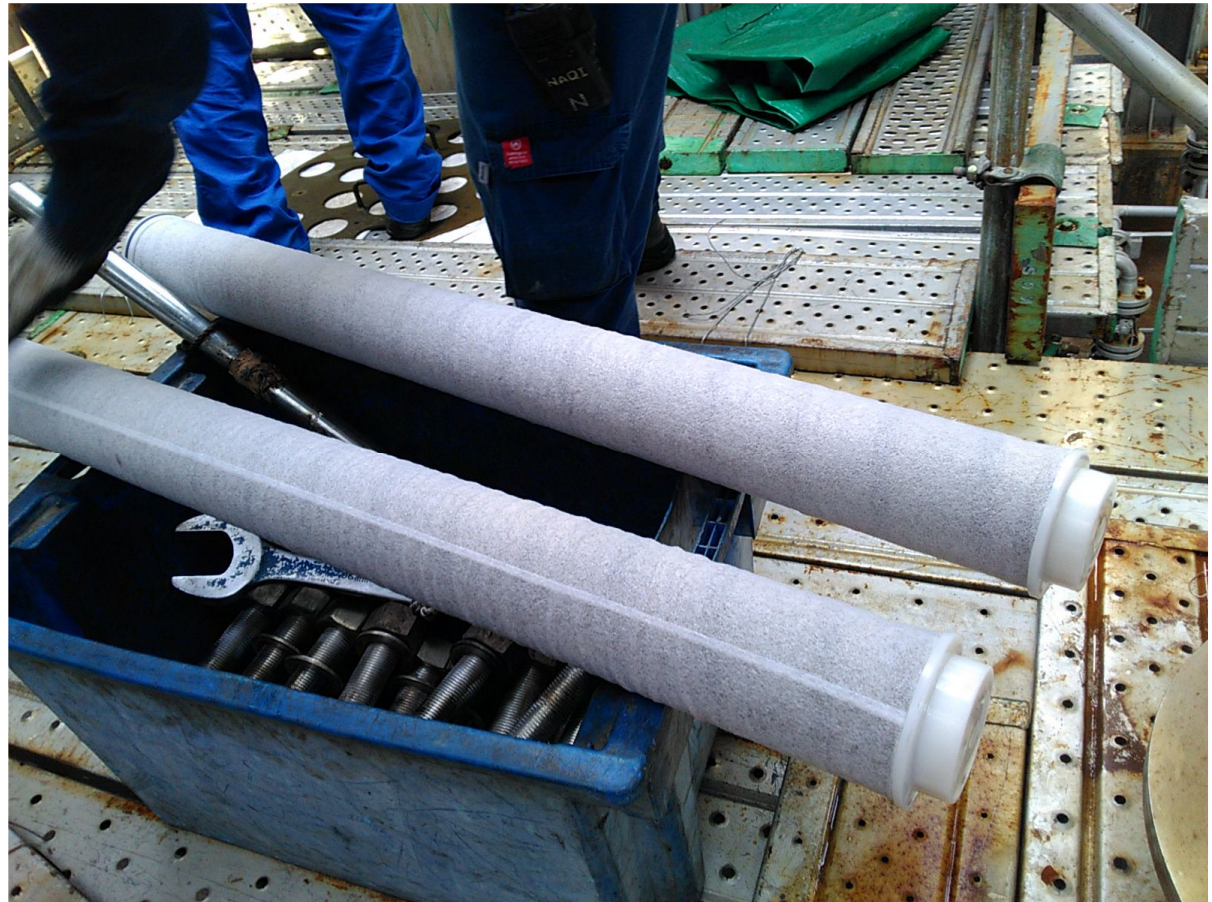
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Old Elements



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