



Monitoring Report

Nass Corporation B.S.C.

ScaleWatcher Installation Report for RO System
and Truck Radiator Protection System

August 13, 2016



Overview

- Installation of SW truck radiator protection system for Back Hoe Unit was on June 20, 2016 and IE8 SW Model in the main inlet pipe before RO System was on July 17, 2016.
- Initial status for each application was noted:
 - * The Back Hoe Truck Unit of Nass Corp. in Saudi Arabia is normally encountering overheating problem every 2-3 weeks because of the old status of the said unit caused by the poor status of the radiator.
 - * External scaling and leaking of the pipe and fittings of the RO system were noted with pictures as reference point to monitor the effect of SW water treatment system.
- Progress for each application were closely monitored with each respective supervisor.



Truck Radiator Protection System- Back Hoe Unit

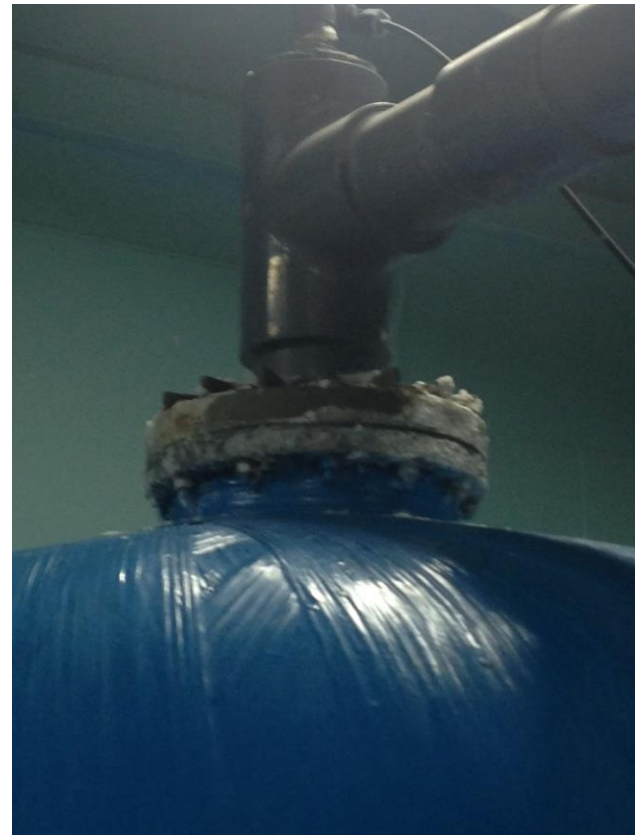
- Installation was completed last June 20, 2016 in a Back Hoe Unit that is regularly deployed in Nass Corp. projects in Saudi Arabia.
- The truck unit is causing high maintenance expenses due to overheating problems caused by poor cooling system of the radiator affected by scaling and corrosion. Muddy circulating water was noted by the mechanic- Mr. Gerald.
- The said unit is observed to overheat every 2-3 weeks after repair and maintenance.
- After installing SW- Radiator Protection System to treat the circulating water, the mechanic that no overheating problem has occurred up to this date since June 20, 2016. (exactly 55 days up to this day)
- Laborious repair and maintenance by the company has been significantly avoided.
- Video and pictures is to be forwarded by the mechanic upon replacement of the circulating water coolant of the radiator once the unit has been returned to the garage after the completion of the on-going project.
- Written report is requested to fully document this development.
- The system is conclusively to be a **success**- initial positive results has been achieved as feedback by the mechanic.



RO System with SW Electronic Water Treatment



RO Status Before SW Installation



RO Status Before SW Installation



RO Status After SW Installation



RO Status After SW Installation



Side by Side Comparison

July 16, 2016- SW was fully installed



July 27, 2016- after SW was fully installed (11 days only)



Side by Side Comparison

July 16, 2016- SW was fully installed



July 27, 2016- after SW was fully installed (11 days only)



Softening & Removal of Scales in Other Areas

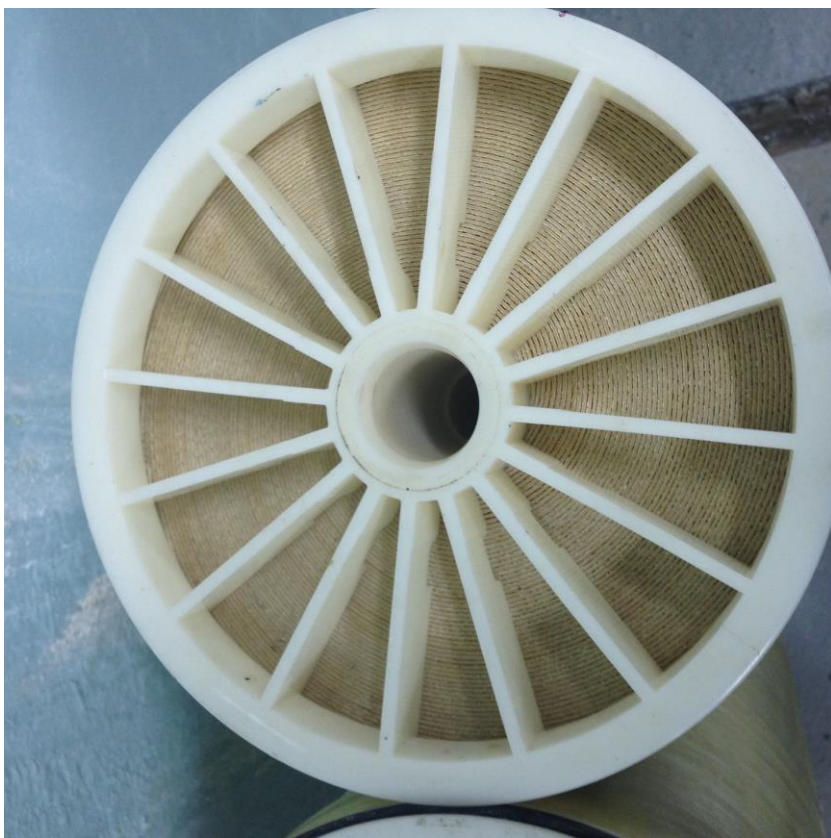
Hard external scaling started to soften



Scaling in the RO Membranes started to soften and water leaking has been minimized.



Nass Corp.- RO membranes which are prematurely replaced resulting to high maintenance expenses



Nass Corp.- RO membranes which are prematurely replaced resulting to high maintenance expenses



Observations:

- External hard scaling in the RO system, pipelines and fitting has started to soften in just 11 days after SW was fully installed.
- TDS did not change. This is possible due to high usage of chemical maintenance such as acids, Cl and descalers resulting to high operational expenses for the RO system; premature replacement of RO membranes.
- Water leaking in the pipeline and fitting has significantly improved.
- Maintenance program is ONLY being handled and performed by 3rd party maintenance team- Rain Drops. No internal QC team from Nass- for checking balance purposes.
- SW electronic water treatment was shutdown for 9 days (since Aug. 04, 2016) already as ordered by Mr. Roy Matthews of Rain Drops- a chemical water treatment supplier of Nass Corp.
- 1 vessel composed of 5 membranes was prematurely replaced as recommended by Mr. Roy Matthews.



Recommendations:

- Turn ON and implement a NON-STOP operation of the installed SW water treatment to fully realize its benefits.
- Implement the 30-50% reduction of chemical water treatment and conduct a weekly monitoring based on water parameters required by the Ministry.
- An internal QC team for the RO system is highly recommended to fully monitor the RO system performance and checking balance for the company's interest.



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