Annex 4.2
Mass Balance for Outfall TDS

Outfall TDS Calc.(worst design conditions)

Mass Balance for TDS of Outfall(Ref: Design Document, Alfa Laval Process Flow Diagram, Rev.3) Date: 12.12.2012

Calc. as per design, worst conditions.

Total SW Flow	44.8	mgpd
eq.	201600	M3/day
eq.	8400	M3/hr.
eq.	8652	t/hr.

Total Sea water Inlet	8,652.00	t/hr.	
TDS sea water inlet	45,000.00	ppm	as per design
Distillate flow	570.40	t/hr.	
Brine Flow	2,842.00	t/hr.	
Brine TDS to FF tank	54,000.00	ppm	as per design
Cooling Water Flow to FF tank	5,239.60	t/hr.	
Cooling Water(TDS)	45,000.00	ppm	as per design
Outfall Flow from FF tank	8,081.60		

Mass/TDS Balance: Outfall flow*TDS(outfall)= Brine Flow*TDS(Brine) + Cooling Water Flow* TDS(cooling water)

$$TDS(outfall) = \frac{\text{Brine Flow}*TDS(\text{Brine}) + \text{Cooling Water Flow}* TDS(\text{cooling water})}{\text{Outfall flow}}$$

TDS(outfall)= 48,164.97 ppm

Difference= 3,164.97 ppm

Conclusion:

Below NEQS limit for TDS of 3500 ppm