



COOLING TOWER EVALUATION

PROJECT NO	:	001/CT/I/2026	PREP BY	:	AMD
DOC NO	:	21-CAL-HPLT-2077	CHECKED BY	:	
OWNER	:		APPROVED BY	:	
LOCATION	:		REV NO	:	0

I. DESCRIPTION

This evaluation assesses the overall performance of the cooling tower by analyzing key parameters such as efficiency, cycles of concentration, corrosion and scaling tendencies, water clarity, and microbiological activity. The assessment helps identify potential issues that could impact system reliability, including scaling, corrosion, suspended solids, and bacterial growth. By understanding these factors, proper water treatment and maintenance strategies can be implemented to optimize cooling tower operation, improve efficiency, and extend equipment lifespan.

II. EFFICIENCY

Air Dry-Bulb temperature	T_{DB_amb}	:	30.0	°C	adjust to your area
Humidity Relative	T_{RH_amb}	:	67.0	%	adjust to your area
Cooling water inlet temperature	T_{CT_in}	:	35.0	°C	Enter the actual value
Cooling water outlet temperature	T_{CT_out}	:	27.0	°C	Enter the actual value
Air Wet-Bulb Temperature	T_{WB_amb}	:	25.0	°C	
Differential Temperature	ΔT	:	8.0	°C	
Cooling Tower Efficiency	EFF_{CT}	:	80	%	

III. CYCLES ANALYSIS

		Makeup Water	Cooling Water	Cycles
Conductivity	$\mu S/cm$	500.0	900.0	1.80
Silica	mg/L	15.0	26.0	1.73

IV. CORROSION & SCALE INDICATOR (LSI METHOD)

		Makeup Water	Cooling Water
pH		7.7	7.7
Total Dissolved Solid	mg/L	500.0	900.0
Total Hardness	mg/L	56.0	56.0
Calcium Hardness	mg/L	28.0	28.0
M-Alkalinity	mg/L	40.0	40.0
pHs		8.84	8.87
LSI		-1.14	-1.17
		Corrosion	Corrosion

V. CORROSION INDICATOR (FE VALUE METHOD)

		Makeup Water	Cooling Water	Safe Limit
Fe	mg/L	0.11	0.15	0.19
Cycles			1.73	Safe*

*The Fe value in the cooling water system is the amount of Fe that enters from makeup, multiplied by the cycle. If it is excessive, Fe generated from corrosion.
or it could be that Fe has entered the system from external sources.

VI. CLARITY & ABRASION (TURBIDITY/TSS METHOD)

		Makeup Water	Cooling Water	
Turbidity	NTU	20.0	36.0	Turbid
TSS	mg/L	25.0	40.0	Safe

VII. MICROBIOLOGY (TPC / DIP SLIDE)

		Makeup Water*	Cooling Water	
Total Plate Count	CFU/mL	5.70E+03	1.20E+06	Very not safe-Give Biocide immediately, hyperhalogenation, drain, retest in 3-7 days

*makeup water data is only optional, just a comparison. if makeup has a much lower one, then the generation occurs in the cw system. otherwise, makeup itself carries as a source of bacteria

VIII. MICROBIOLOGY (NITROGEN SUBSTANCE)

		Makeup Water	Cooling Water	
Ammonia	mg/L	13.60	1.26	Oxidation Detected*
NO ₂	mg/L	0.02	0.03	
NO ₃	mg/L	1.60	9.80	

If the Ammonia concentration in the Makeup Water is high, but then decreases significantly in the Cooling Water, while the NO₂ or NO₃ levels increase from the Makeup Water to the Cooling Water, it suggests that an oxidation process has occurred within the system
Oxidation can occur due to the presence of denitrifying bacteria. otherwise, there are chemical oxidizing agents that enter the system, such as NaOCl, H₂O₂, or similar.