AQuA®©

Waste Water

Dahej

Industrial Effluent Pumping

GUJARAT INDUSTRIAL DEVELOPMENT CORPORATION

Gujarat Industrial Development Corporation established in **1962** develops Industrial Estates with State of the Art Infrastructure such as roads, drainage, electricity, water supply, street lights, and ready-to-occupy factory sheds.

Gujarat is the only state to enact the **SIR Act** in 2009 with the objective of creating ultra large sized Investment & Industrial Areas to develop them as Global Hubs - a SIR has a minimum area of **10,000 hectare**.

Dahej & Vilayat industrial estates have around 400 medium and large-scale units of which 90% are those making chemicals. The major water-intensive industries are ONGC Petro Additions Limited *(OPAL)*, Gujarat Alkalies and Chemcials Ltd *(GACL)*, Hindalco, Reliance, Meghmani, Gujarat Fluorochemicals Ltd, Grasim Industries Ltd, Jubilant Life Science and units located in Dahej SEZ - these units consume around 50 million gallons of water/day.

- **SIR** *(Special Investment Regions)*
- **SEZ** *(Special Economic Zone)*
- **PCPIR** *(Petroleum, Chemical & Petro Chemical Investment Region)*

GIDC Drainage scheme Infrastructure at Dahej PCPIR.

GIDC had commissioned a 90mld *(65 MLD for Dahej + 25 MLD for Vilayat Industrial estate)* Effluent collection and disposal scheme at Dahej PCPIR in year 2006-07.

Main components of existing drainage scheme were as below:

1. 90 MLD *(65 MLD from Dahej + 25 MLD from Vilayat)* Final Drainage Pumping Station (DPS) at Dahej.
2. 25 MLD drainage pumping station at Vilayat.
3. Ø 710 mm HDPE pipeline *(39.5 Kms)* from Vilayat DPS to Dahej Final DPS.
4. Ø 1000 mm HDPE pipeline from Final Drainage pumping station to Landfall point. *(9.5 Kms)*
5. Ø 1000 mm CS offshore pipeline from Landfall point to Diffuser point. *(4.25 Kms)*
6. The pumping machineries at Final drainage pumping station were designed for 90 MLD of effluent discharge with 100 % standby *(2 working + 2 standby)*.

Situation :

Initially, in 2008-09, only three effluent connections were made & only 0.76 MLD effluent was received at the Final DPS - there after as the number of industries increased, the Effluent quantity received increased to 35mld by 2015-16.

But the performance of the overall Effluent handling system **especially the Conventional Horizontal Non Clog pumps was not upto the mark**. Due to chemical precipitation, there was substantial erosion of these pump's Glands & Sleeves leading to high leakage of effluent from pumps - this subsequent corrosion of bearings *(of pumps & motors)* ultimately leading to the breakdown causing Overflowing of Effluent leading to severe Environmental issues & Authorities *(Gujarat Pollution Control Board and others)* to force heavy penalties.

Due to Different Type of Chemical Mixing liquids, equipments like Pipes, Valves, Conventional Pumping Machineries got **Scaled** & **Choked**.










Corrective Action Taken

All Major Chemical Industries's production depend on Effluent Disposal to Sea but due to frequent breakdown of Conventional Horizontal NC pumpsets; GIDC had to take shutdown frequently leading ultimately production loss. GIDC had constructed all Pumping stations suitable for Conventional Dry Pit NC pumps.

GIDC converted these Dry Pits by Artificial Pondage to Wet Pit type & installed Aqua's Submersible Effluent NC pumpsets in these "Wet Pits". Now, due to the hugely successful operation & low downtime, GIDC has eventually **replaced almost all Conventional Horizontal NC pumpsets with Aqua Submersible Effluent Pumpsets**.

Before

After

After

After

GIDC also uses Aqua's Submersible Effluent Pumpsets in their existing Dry Pit Pump House

(with artificial submergence)

Pumping Station	Flow	Head	HP	Qty
Vilayat Pumping station	1000	50	350	1
Dahej final pumping station	1400	40	300	2
	800	40	180	2
	650	48	200	2
Dahej - I	1000	40	215	1
Vilayat Pumping station	600	50	215	1
Dahej - III	237	36	75	6
	202	21	40	6
	43	15	7.5	6
Dahej - I	91	25	20	6
	91	21	15	6
SEZ final pumping station	152	36	40	4
	46	18	7.5	4
	219	22	40	4
Dahej - III	106	25	20	4
	64	15	10	4
	43	25	7.5	3
Sayakha E1-1 Pumping Station	32	32	15	6
	83	27	30	6
	57	32	17.5	6
	135	29	30	6
	125	22	20	6
	113	24	22.5	6
	79	55	45	6

" Horses for the Courses - at Aqua, we pride on our heritage of unparalleled experience in Submersibles & strive to offer robust solutions after most of our competitors have failed "

*... **S R Tidke** & **A R Malik** (Sr. Managers Marketing)*

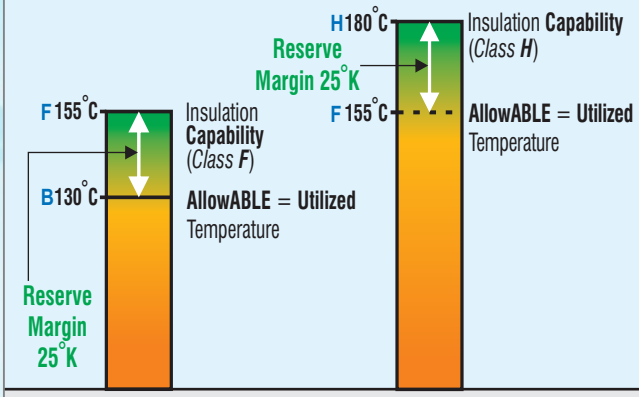
Waste Water

Benefits of Aqua's Submersible pumpsets

Huge Motor Reserve Margin: based on **Arrhenius** equation; for every 10°C Drop in Temperature, the useful Life of Insulation is Doubled.
Hence with a **50°K** Reserve Margin (***v/s just 25°K of Competitors***); **Aqua's** *(Motor {Stator Insulation})* will have a **6 times Higher Life** *(than competitors)*...!

Designed for upto **55°C Ambient temperature**

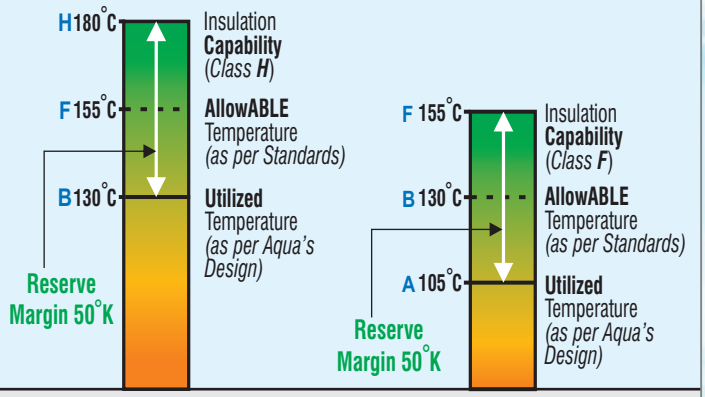
Competing Designs / Motors



Just 25°K Thermal Reserve **Margin**

Class "**F**" Insulation x Class "**B**" Utilization	Class "**H**" Insulation x Class "**F**" Utilization

Aqua's TESWC Induction Motors



50°K Thermal Reserve **Margin** leads to **6x** Higher Life.

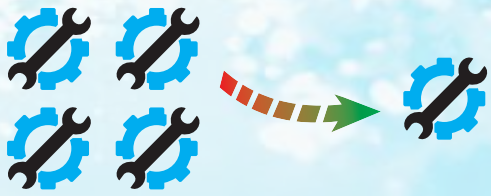
Option1 : *(Medium & Large LT Motors)* Class **"H"** Insulation x Class **"B"** Utilization	**Option2** : *(HT & Smaller LT Motors)* Class **"F"** Insulation x Class **"A"** Utilization

Thanks to the use of **Ultra Modern Design Mechanical** Shaft **Seals** *(instead of Rope Packed Glands as in Conventional NC pumps or Simple Low Profile Mechanical Shaft Seals used in Sewage Submersible pumps)*; **despite Severe Precipitation** *(of Effluent)*; Aqua's pumpsets run much more robustly.

Superb Bearing Life
Anti Drip, Premium Synthetic Grease ensures a minimum Regreasing Interval F_{10H} of 75,000h *(for Pumpsets rated upto 650kW)* & 45,000h *(for larger kW)* Pumpsets.

Oversized Shaft for Fail Safe Operation

Pump Clogging though undesirable, is often unavoidable - it will cause Severe Stress on Shaft & possibly causing its **Shearing**.
To tackle this problem, Aqua's Pumpsets are built with an **Oversized** SS **Shaft** & designed **without** Any **Sleeves** *(below the Mechanical Seals)* thereby **Eliminating shaft failures, Reducing Maintenance** & the **need** of **Spare Parts**.



Saves *(upto **75%**)*
Spare Parts & **Consumables***

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