

*Agalgaon - Jakhapur, Mhaisal 6A & Mhaisal 6B
Lift Irrigation Schemes
Sangli district, Maharashtra*

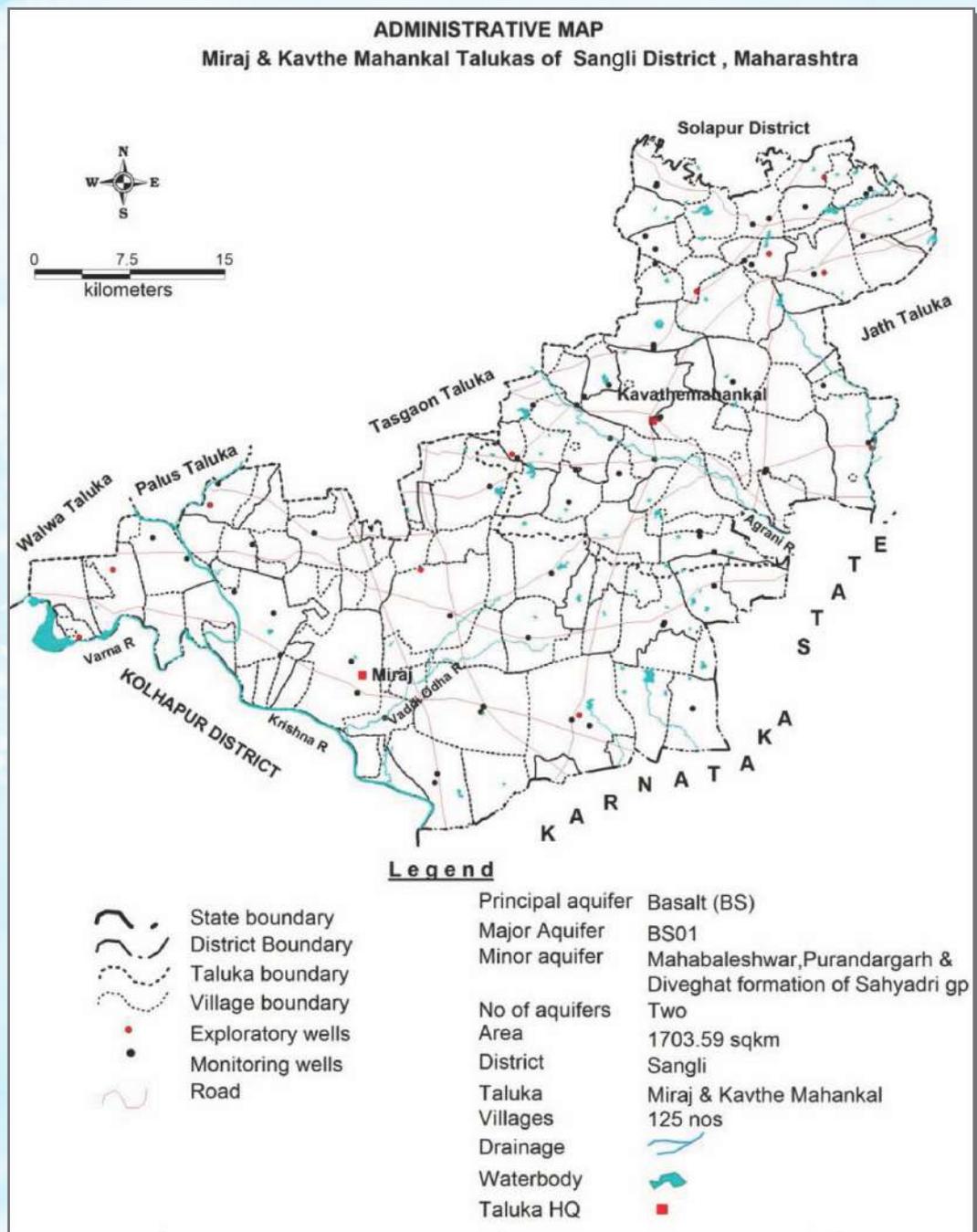




The area experiences the sub-tropical to tropical temperate monsoon climate with a hot summer and general dryness throughout the year except during the south-west monsoon season.

Despite good rainfall & ample water in River Krishna, due to undulating terrain; large swathes of land went unirrigated.

To address these problems; Maharashtra Government's Water Resources Department had set up m/s. MKVDC.



सिंचनात् राष्ट्रोद्धार :

Situation :

Historically, MKVDC relied on Conventional Vertical Turbine pumpsets requiring Large, Costly, Complex Intakes to house & Long Construction time to build.

Also, due to Seasonal usage of Irrigation pumps; Silt & Rust accumulation into the Water Lubricated Line Shaft Bearings of VT pumps made them susceptible to Starting Problems. Due to complex Auxillary & Ancillary systems; the Operation & Maintenance hassles & costs were high with VT pumps.

Hence, under the new thought process; MKVDC retrospected the basic designs of Pumping Machinery & Civil Structure with a goal of **“Minimum Cost & Time - Maximum Results & Reliability”**

Solution :

History of Agalgaon-Jakhpur, Mhaisal 6A & 6B LIS Project's Design :

All these three schemes were originally planned and conceived with Vertical Turbine (VT) pumps option as was conventionally used and considered by Water Resources Department of Govt. of Maharashtra, against all their schemes completed in past.

Based on extensive studies involving Specially Constituted Team of Officers from their Central Designs Organisation (CDO), **Mechanical Organisation** (CE-Mechanical) and concerned **Project Civil** team. For this, a knowledgeable team of Engineers made Site Visits to various installations of SubCF Pumps in other States to have hands on experience of the Techno-Economical benefits of SubCF Pumps like simplicity & savings in pump house construction cost (*there-by reducing overall project capital cost to great extent*), maintenance - free aspects, simplicity & ease of operation and so on...to name a few, compared with conventional choice of VT Pumps option. Then, they unanimously decided to go in for using SubCF pumps

Based on the observations of sites, planning were prepared for complete pumping solution to cater to it's original Irrigation command full flow by electro mechanical components and rehabilitation of civil components. *“Procurement of Plant, Design, Supply, Installation, Testing and Commissioning of various Pumping Machinery Including Associated Electrical, Mechanical and Civil works.”*

Agalgaon- Jakhapur Lift Irrigation Scheme



Agalgaon- Jakhapur Lift Irrigation scheme is situated at **village Kuchi** in Sangli district where water would be available from the **Jath canal**. The Command area is **1910 hectares** comprising of villages Agalgaon, Jakhapur, Kuchi, Shelakewadi, Landgewadi and Zurewadi of Taluka Kavathe Mahankal.

Agalgaon- Jakhapur Lift Irrigation Scheme



TO WHOMSOEVER IT MAY CONCERN

This is certify that M/s. Aqua Machineries Pvt. Ltd., Ahmedabad has supplied, erected & commissioned Submerged Centrifugal (SCF) Pump set with Integral LT Submerged Motor for our Agalgaon- Jakhapur Lift Irrigation Scheme, Dist. Sangli.

The Pump set particulars are as follows:

Pump set Type	: Submerged Centrifugal Pump set with Integral motor (Auto- Coupling Installation)
Application	: Raw Water Handling (Irrigation)
Pump Model	: ARS_V_AC_1st_VoG_2052_M_M_0335_00415_NJ
Head	: 81.95m
Discharge	: 765.36 M3/hr
No of Stage (Impeller)	: 1 No.
Pump set Delivery Size	: 200mm
Motor Rating / Voltage	: 335HP / 250KW, 415V
Motor Type & Cooling	: LT Submerged Squirrel Cage Induction - Dry Air filled Totally Enclosed (IP68), Water Cooled (TEWC) (Complying to IC4A1W0 of IS 6362)
Installation	: Vertical Mounted Auto-coupling in Sump

These Pump set was commissioned in **January 2019** and are working satisfactorily till date. Pumps are running smooth without any noise or undue vibrations. We find these pumps having easy for installation and maintenance-free for our various LIS jobs.

outward-1247
Sangli
Date: - 18 SEP 2019



(Signature)
Executive Engineer
Takari Mechanical & Electrical Division,
Warnali, Vishrambaug, Sangli- 416415

End User:

The Executive Engineer,
Takari Mechanical &
Electrical Division,
Warnali,
Vishrambaug, Sangli-416415.

Mhaisal 6A Lift Irrigation Scheme



TO WHOMSOEVER IT MAY CONCERN

This is Certify that M/s. **Aqua Machineries Pvt. Ltd., Ahmedabad** has supplied, erected & commissioned Submerged Centrifugal (SCF) Pump set with Integral LT Submerged Motor for our Mhaisal 6A Lift Irrigation Scheme, Dist. Sangli.

The Pump set particulars are as follows:

Pump set Type	: Submerged Centrifugal Pump set with Integral motor (Auto- Coupling Installation)
Application	: Raw Water Handling (Irrigation)
Pump Model	: ARS_V_AC_1st_VoG_4063_M_L.....0442_00415_NJ.
Head	: 31.72m
Discharge	: 2520 M3/hr
No of Stage (Impeller)	: 1 No.
Pump set Delivery Size	: 400mm
Motor Rating / Voltage	: 442HP / 330KW, 415V
Motor Type & Cooling	: LT Submerged Squirrel Cage Induction - Dry Air filled Totally Enclosed (IP68), Water Cooled (TEWC) (Complying to IC4A1W0 of IS 6362)
Installation	: Vertical Mounted Auto-coupling in Sump

These Pump set was commissioned in **January 2019** and are working satisfactorily till date. Pumps are running smooth without any noise or undue vibrations. We find these pumps having easy for installation and maintenance-free for our various LIS jobs.

outward-1266
Sangli

Date: 8 SEP 2019



[Signature]
Executive Engineer
Takari Mechanical & Electrical Division,
Warnali, Vishrambaug, Sangli- 416415

Mhaisal 6A Lift Irrigation Scheme situated at **Mauje Anakale** in Jath Taluka in Sangli district where water would be available from Billur canal which is attached to **Jath & Kavathe Mahankal Canal**. The total command area is **6120 hectares**.

End User :

The Executive Engineer,
Takari Mechanical &
Electrical Division,
Warnali, Vishrambaug,
Sangli-416415.

Mhaisal 6B Lift Irrigation Scheme



Mhaisal 6B Lift Irrigation Scheme is situated at **Mauje Ankale** in Jath Taluka where water would be available from **Devnal Canal** which is attached to Jath Canal. The total Command Area of **4120 hectares**.

End User :

The Executive Engineer
Takari Mechanical & Electrical Division,
Warnali, Vishrambaug, Sangli-416415



Mhaisal 6B Lift Irrigation Scheme



TO WHOMSOEVER IT MAY CONCERN

This is certify that M/s. Aqua Machinerics Pvt. Ltd., Ahmedabad has supplied, erected & commissioned Submerged Centrifugal (SCF) Pump set with Integral LT Submerged Motor for our Mhaisal 6B Lift Irrigation Scheme, Dist. Sangli.

The Pump set particulars are as follows:

Pump set Type	: Submerged Centrifugal Pump set with Integral motor (Auto- Coupling Installation)
Application	: Raw Water Handling (Irrigation)
Pump Model	: ARS_V_AC_1st_VoG_2563_M_M_0576_00415_NJ
Head	: 82.48 m
Discharge	: 1260 M3/hr
No of Stage (Impeller)	: 1 No.
Pump Delivery Size	: 250mm
Motor Rating /Voltage	: 576HP / 430KW, 415 V
Motor Type & Cooling	: LT Submerged Squirrel Cage Induction - Dry Air filled Totally Enclosed (IP68), Water Cooled (TEWC) (Complying to IC4A1W0 of IS 6362)
Installation	: Vertical Mounted Auto-coupling in Sump

These Pump set was commissioned in January 2019 and are working satisfactorily till date. Pumps are running smooth without any noise or undue vibrations. We find these pumps having easy for installation and maintenance-free for our various LIS jobs.

outward-1248
Sangli
Date: 18 SEP 2019



Executive Engineer
Takari Mechanical & Electrical Division,
Warnali, Vishrambaug, Sangli- 416415

MAHARASHTRA KRISHNA VALLEY DEVELOPMENT CORPORATION

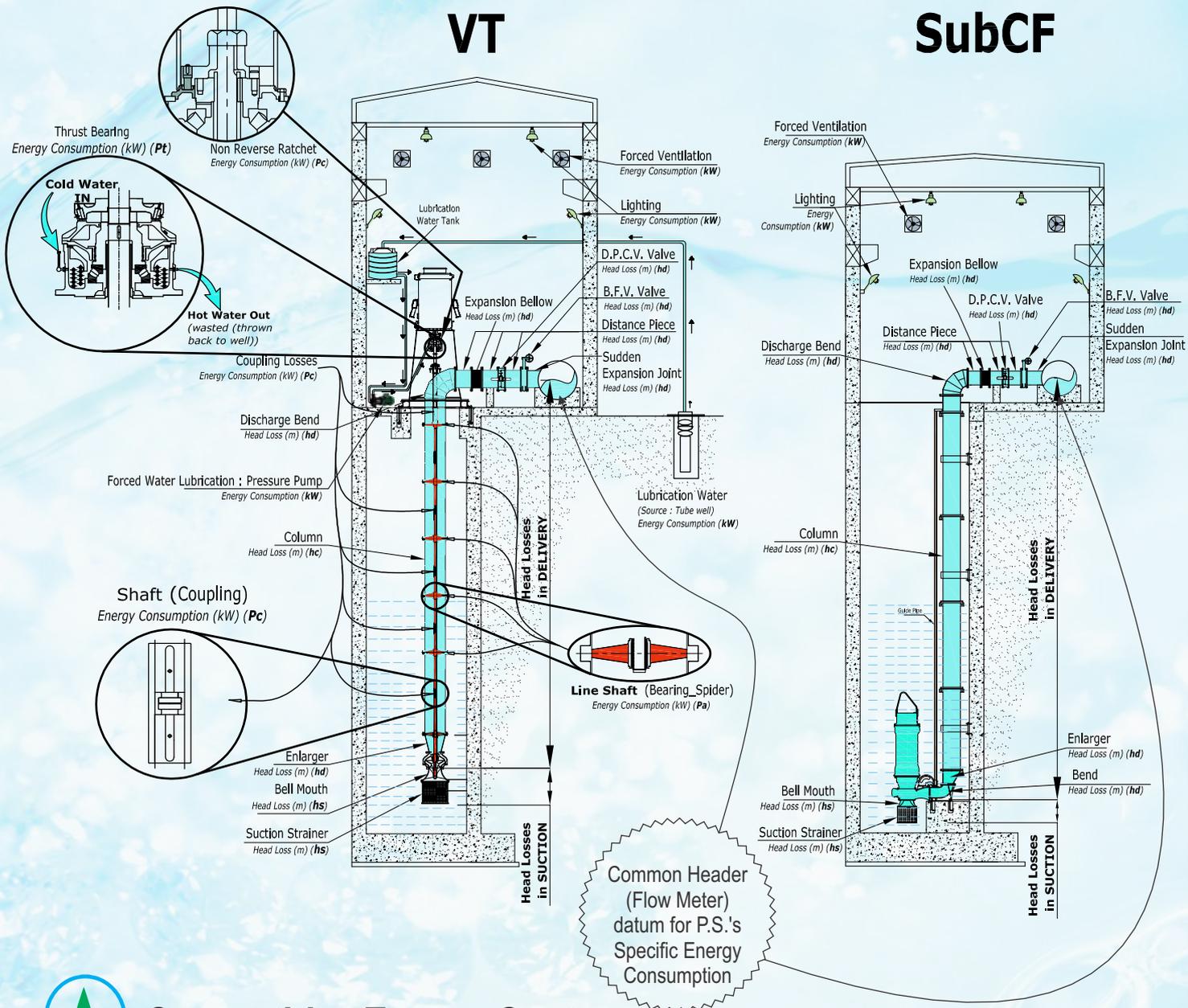
MHAISAL STAGE 6B LIS

TECHNICAL SPECIFICATION OF PUMPING MACHINERY

A) Pumps	
1 pump type/ Make	- Vertical Submerged Centrifugal Pump
2 Pump Hp / Nos.	- 488/4
3 Duty head (m)	- 82.48
4 Duty discharge (m3/sec) per pump	- 0.35
5 pump rpm	- 1500 (syn)
B) Motor	
1 Motor Type/ Make	- Submerged Squirrel Cage Induction
2 Motor kW	- 430
3 Voltage Rating (V)	- 415
4 Full Load Current (A)	
1) With Capacitor (A)	- 604.27
2) Without Capacitor (A)	- 664.70
5 Class of insulation	- H
C) Valves	
a) Butterfly valve	
1) Make /Nos	- Jupiter Engineering /4
2) Dia(mm)/PN rating	- 450 /PN - 1.6
b) Non Return Valve	
1) Make / Nos	- Jupiter Engineering /4
2) Dia (mm) / rating	- 450/PN- 1.6
c) Kinetic Air Valve	
1) Make /Nos	- Jupiter Engineering /4
2) Dia (mm) rating	- 100 /PN-1.6
D) L.T. switchgear Panel	
1. Rating / Make	- 415 V, 3PH, 50 HZ, 3200A / BM Enterprises
2. Feeder details	
a) Incomer - 2 Nos & Bus Coupler 1 Nos	- 415 V, 3200A, ACB L&T make
b) Outgoing Motor feeder- 4+1 Nos.	- 415V, 1250 A, ACB L&T make
c) Capacitor - 4 NO	- 415 V, 70 K V AR, Prabhodhan make
E) EOT Crane	
Make / Capacity	- Shri Abhay Cranes Pvt Ltd, Shegaon / 7.5 MT
Span	- 5.5 Mtr
F) Auxillary Equipments	
1. Temp Scanner	- Letrotech Make, 12 Channel, 4 Nos
2. LT Cable	- Power Cable - 1.1KV Two run, 3 core 300 sqmm, Al cable for each pump Control Cable - 1.1 KV, 20 core, 1.5 sqmm, single run for each PMU. and valve controls
3. PMU	- Aqua make
Cost of Work Contractor	- Rs. 3,88,22,460/-
	- M/s. Aqua Machinerics Pvt Ltd., Ahmedabad

Takari Mechanical and Electrical Division, Sangli.
Shot on OnePlus
By MANISH GHANWAT

Sources of Energy; Head & Flow Losses in Pumping Stations



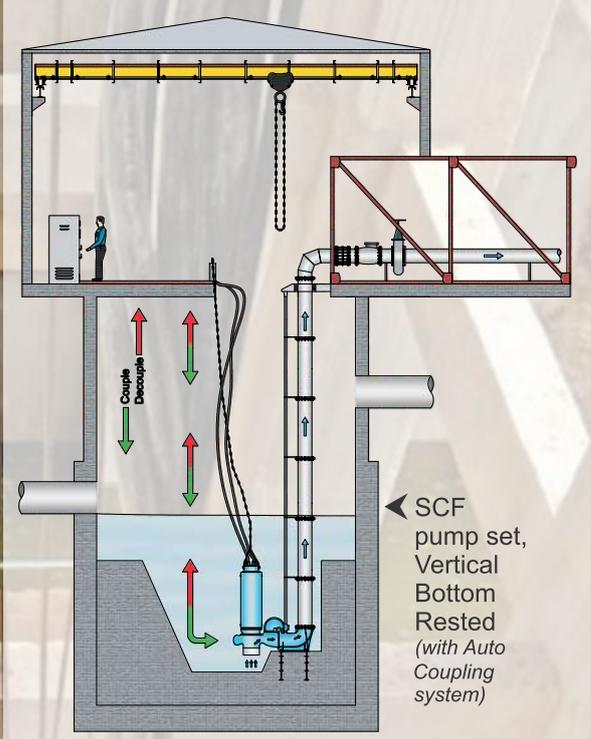
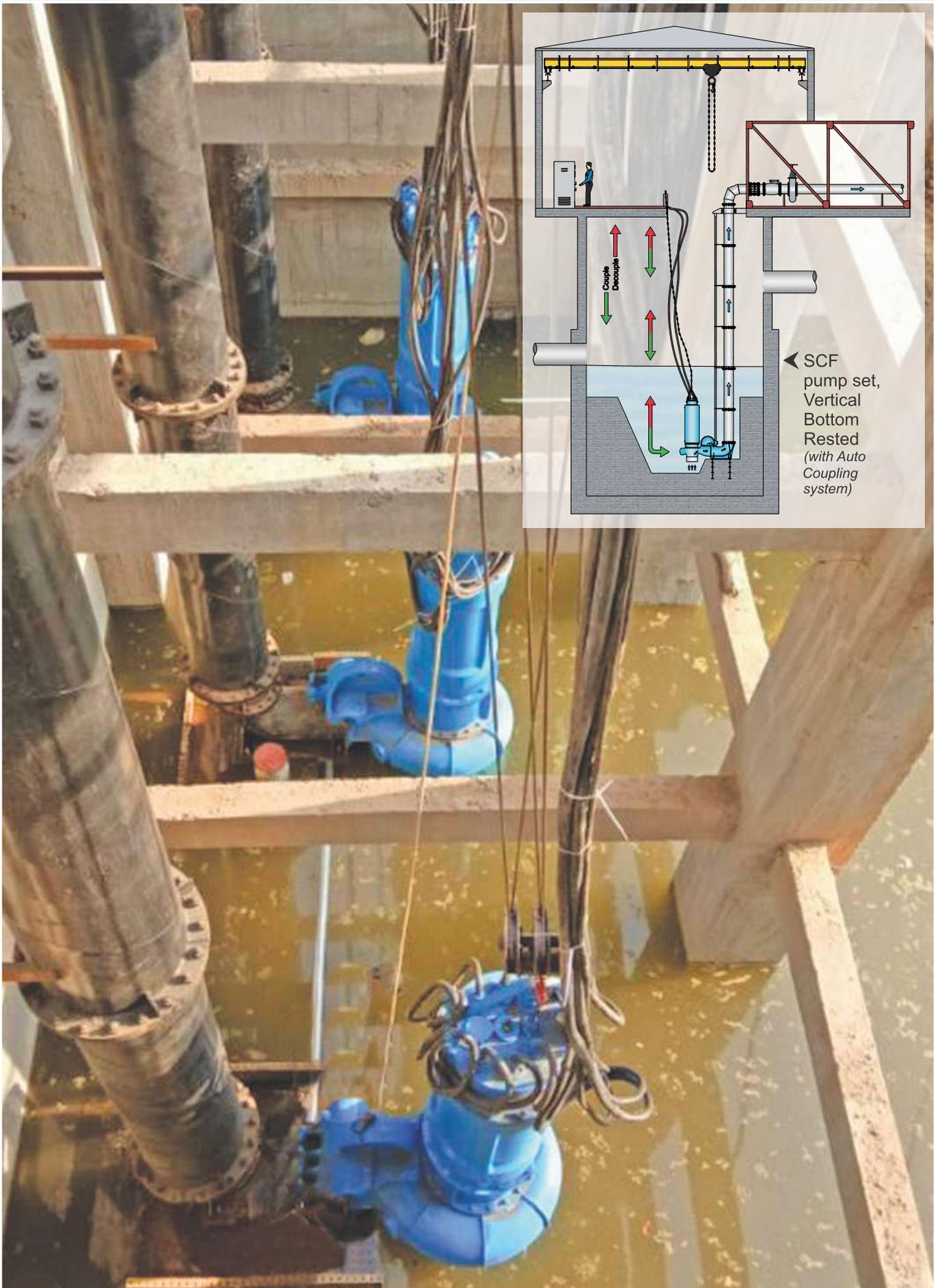
Competitive Energy Costs

The Bowl Efficiency of SubCF Pumps is nearly similar to VT pumps....

However, the **Elimination** of Line Shaft, Coupling, Thrust Bearing, Spider, Shaft Enclosing Tube, Forced Water Lubrication system, etc causes a **Reduction in Power Consumption (kW)** as well as a **Reduction in Hydraulic Losses (m)**.

Hence, **Power Consumption of SubCF based PS is Slightly Lower (than VT pumps based PS)** leading to **Lower Wire to Water (Specific Energy) Energy Consumption (kW/m³)** - the savings growing larger & larger with deeper column depths

Quick & Easy Installation:





Robust & Reliable

No breakdown even in high silt levels & rust proof bearings against long periods of Idling.



Zero Maintenance

Mechanical Shaft Seals are Silt & Rust resistant.

Bearings are Greased for Life.



Minimal Noise, Vibration & Heat Emission.



Low Life Cycle Costs (LCC)

Zero Consumables, Minimal Maintenance & Good Wire to Water Efficiency.



User Friendly

The use of Auto Coupling system enables Installation / Removal in matter of minutes (*for cleaning grass, plastics, etc stuck up in suction strainer*)



Ultra Low ManPower requirement

- **Requires No Special Pre – Post / Ancillary-Auxillary Operations** (*like Valve Opening- Closing, starting-stopping-monitoring Forced Water Lubrication systems operation etc.*)
- **Requires No Consumables** (*like Oil, Grease, Gland Ropes, Bush, Pins, Couplings, Sleeves, etc*)
- **Requires No Routine Maintenance** (*like Oiling, Greasing, Gland Tightening, Gland Rope replacement, Shaft Alignment etc.*)



Inbuilt Intelligent & Extensive Monitoring devices allow you to Quickly (& Remote[#]) monitor pumpset's health

- **LSLD** detects Pressurized Water leakage from Mechanical Seals
- **CCWLD & SBWLD** detect Accidental Water leakage from Cable Sheath's Cuts &/or Nicks in to motor
- **BTDs** in the form of Bi-metallic Switches & PT100 monitor Bearing Temperature
- **WTDs** in the form of Bi-metallic Switches &/or PT100 monitor Stator Winding temperature against Thermal Overloading

([#] requires additional communication hardware)

"As compared to VT pumps, SubC7 pumps are very simple to Operate & Maintain. We don't have to operate Forced Water Lubrication before starting the pumps or worry about Rusting & Jamming of Line Shaft Bearings between watering seasons or Alignment (& subsequent Shaft Bearing Failures)."

- Prakash Latte, Operator; Agalgaon Jakhapur PS
- Akshay Shejul, Operator; Mhaisal 6B PS
- BabaSaheb Janakar, Operator; Mhaisal 6A



"After studying Technical Materials, Visiting some Installations & doing Comparative Costings, based on approximately 25%-33% Savings; we decided to go in for latest technology SubC7 pumps & are satisfied with the results."

- Mr. H. V. Gunale, S.E., Sangli Circle, MKVDC



Aqua Machineries Private Limited

www.aquapumps.com

Registered Office & Manufacturing Plant

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