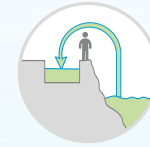




Why Floating Pontoon PS?



Initial Fill
(During Commissioning)

Make Up Water
(MUW) (During Operation)



*Aqua's (1005 hp @ 3.3kV) Submerged Centrifugal Pumpsets
based Floating Pumping Station lift $18,494\text{m}^3/\text{hr}$ @ 140m
Water for the Initial-fill of the Lower Reservoir at
Pinnapuram IREP 1,680 MW*

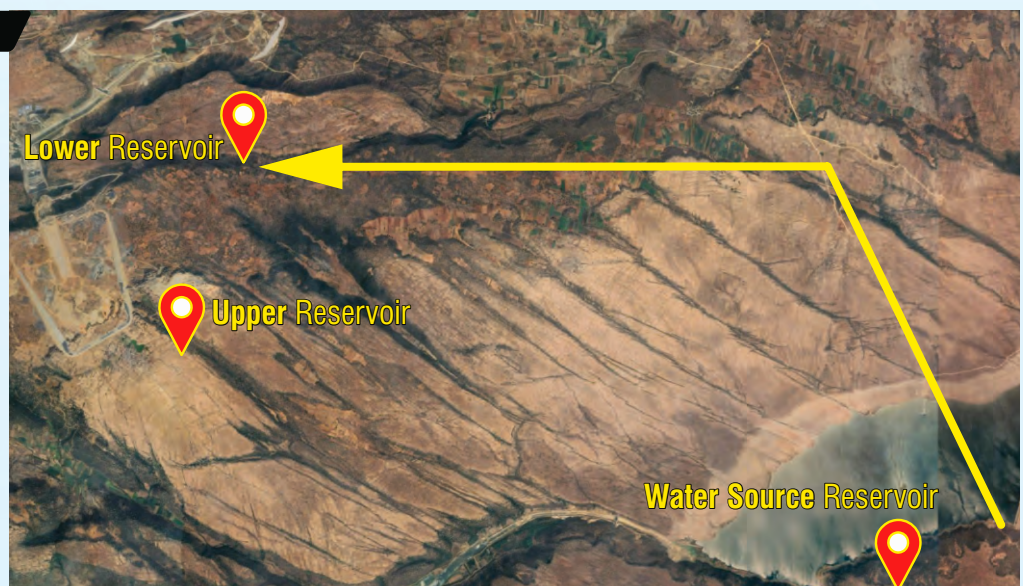


Being Artificial Reservoirs, Water for Initial Fill was to be Pumped from nearly **14km** (from Gorakallu reservoir) & at a Static Lift of **96m**

Aqua's Scope of Work

Design, Engineering, Manufacturing, Supply, Installation, Testing & Commissioning of Entire Floating Pumping Station consisting of:

- 1) **SubCF pumpsets**
14W+1S, 1005hp
@ **3.3kV**
(1321m³/hr x 140m)
- 2) **Pontoons** along with **Walkways**
- 3) SS Flexible & MS fixed **Pipelines**
- 4) **Valves**
- 5) 3.3 KV **VCB Panels**
- 6) 1005hp 3.3kV FCMA **Soft Starters** with 3.3kV **Capacitors**

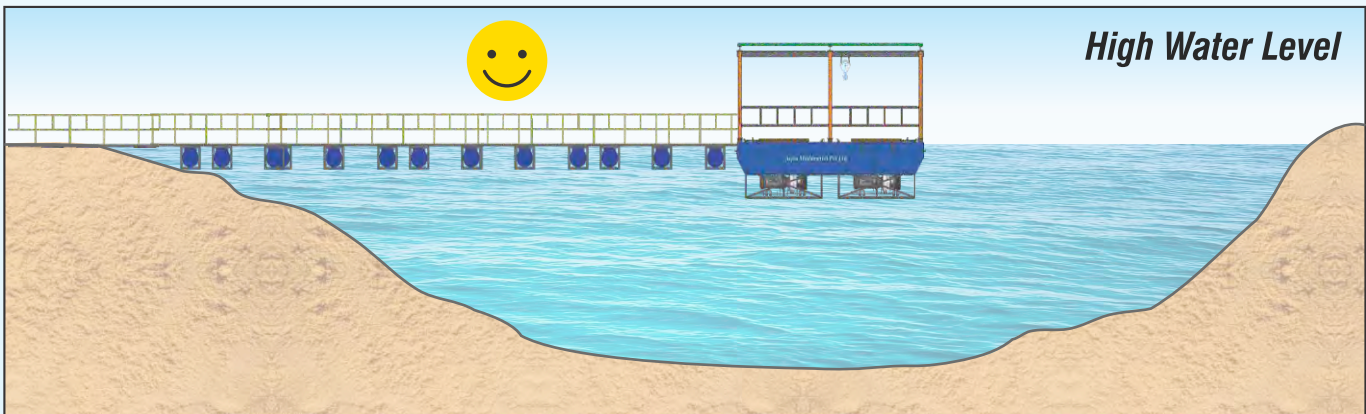


- 7) HT & LT **Cables**
- 8) Auxiliary **Transformer** 3.3 KV/0.415KV
- 9) DCDB cum **Battery Charger Panel**
- 10) **Earthing etc.**

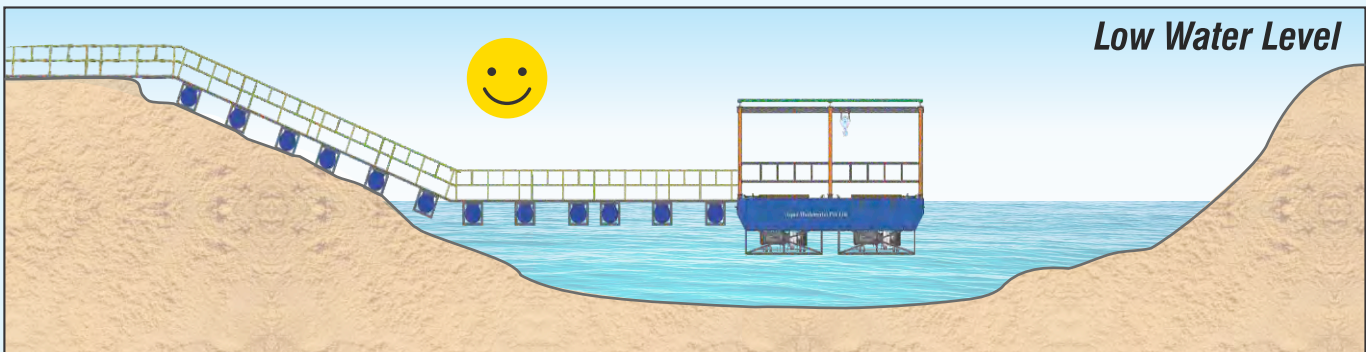
Why Floating Pontoon PS...?



With Submerged pumpset & Pontoon Technology, you have a **100% Guarantee** of being able to **Start Water Supply on Planned Date** irrespective of delays in Construction of Intake Well, Meandering Water courses, El Niño, etc.



High Water Level



Low Water Level

24 x 7 x 365 Water Supply is ASSURED Irrespective of Rise or Fall & Shifting of Water Course



Avoids the need for Time Consuming & Risky (Incise of Meandering River) RCC Intake well

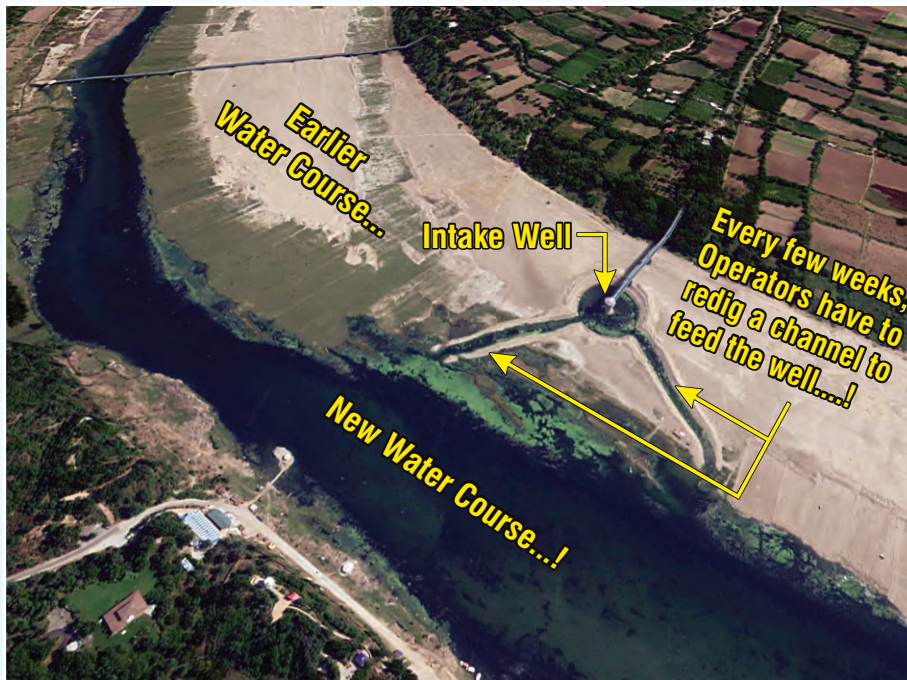


Avoids issues of **Land Acquisition** (for Pumping Station)



Eliminates Inundation & Flooding issues faced with Land-based Traditional Pumping Stations

Why Floating Pontoon PS..?



Quandry :

Where to Construct the Fixed Intake Well (to ensure that Water always comes in to the Well)...

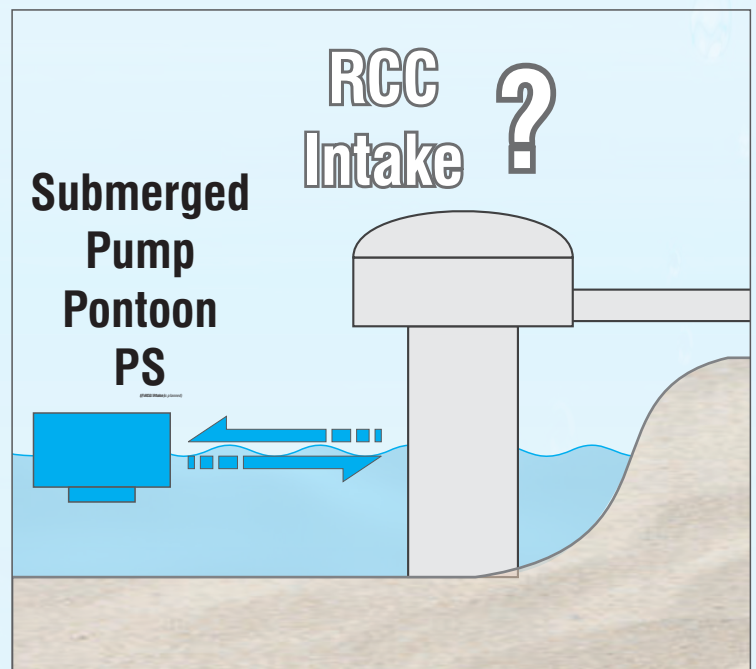
Solution :

Instead of a Fixed Well, go for a Submerged Pump based Floating Pontoon Station as it can be easily Shifted / Re-Located depending on the Water Course....

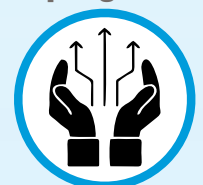
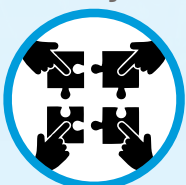
Instead of a **Intake Well dependent VT / HSCF pump**, in the Tender itself; opt for Versatile **Submerged pumpsets** which can be used :

- 1) **Either**, in a **RCC Intake Well** (if required (& as & when constructed))
- 2) **or on Floating Pontoons** also (if the Intake Well is done away with (or delayed in construction)) to be ordered **only if required**.

Either ways, Client is assured of Timebound Commissioning of Water Supply (as soon as Pipelines are laid & Electrification is done) at **No Additional Cost** - i.e. an *Insurance Policy without Premium*.



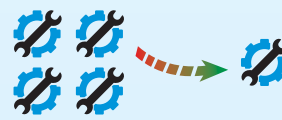
**Synchronization of
Hydraulic Engg + Pump + Pontoon + Walkway + Electricals + Piping
System Design on to a Single Vendor
for Turnkey Responsibility &
Harmonious System Performance**



Saves (upto 65%) of Life Cycle Costs*
(Capital + Operational (Spares + Consumables + Manning + Handling Shifting))



Saves (upto 66%) Man Power*



Saves (upto 45%-75%) Spare Parts*



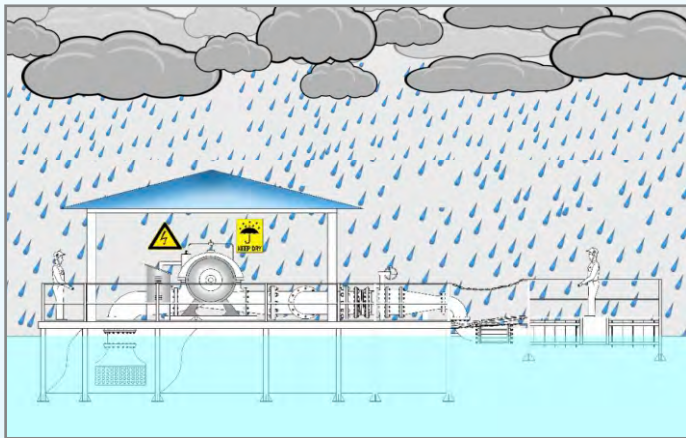
Saves (upto 70%) Consumables*

*Refer our detailed studies

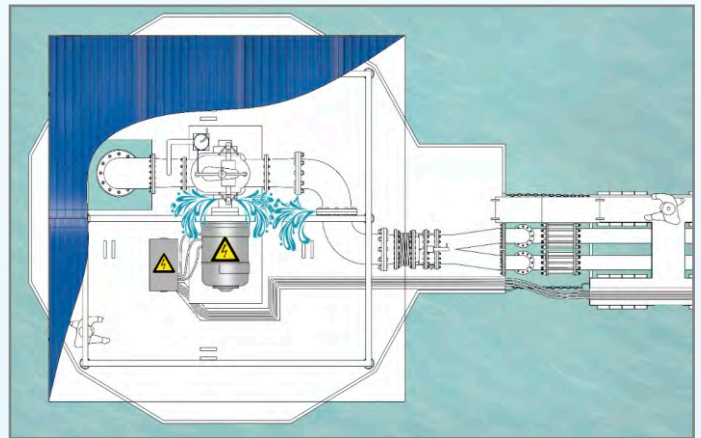
Limitation of Conventional Motors



Motors of VT & Horizontal Pumps need to be Protected from...



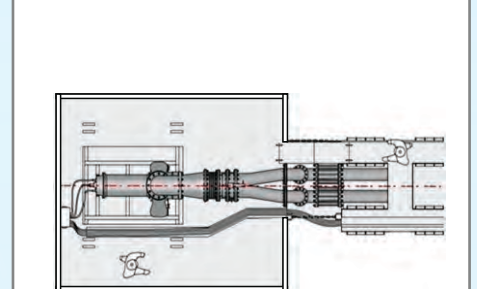
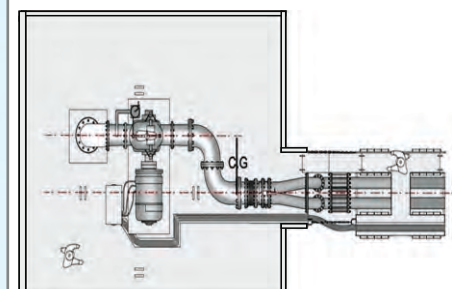
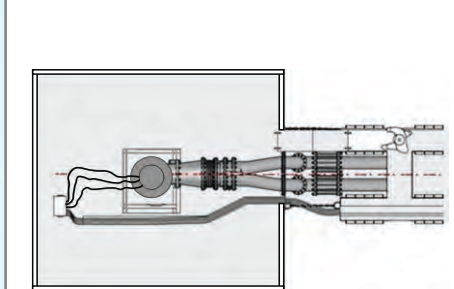
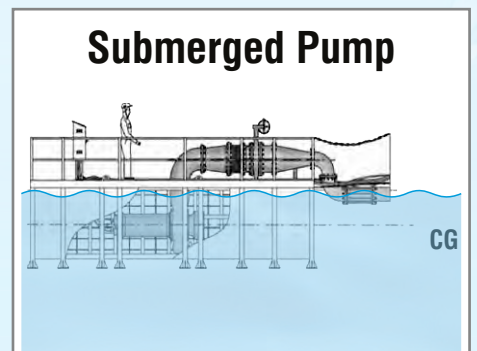
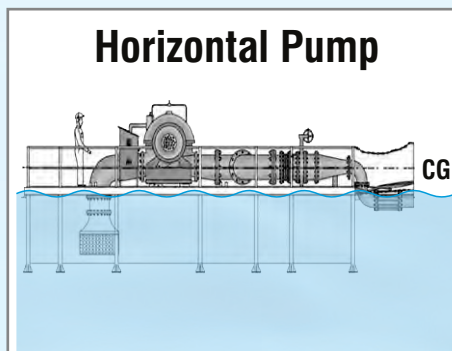
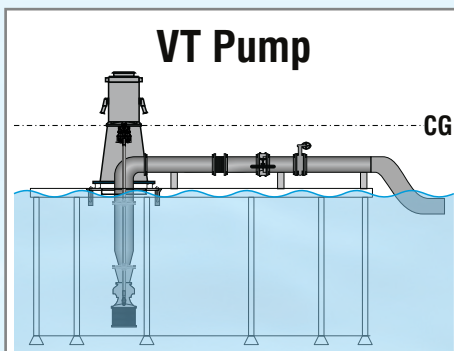
...Rains, Storms & Splashing Waves !

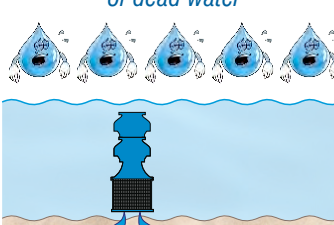
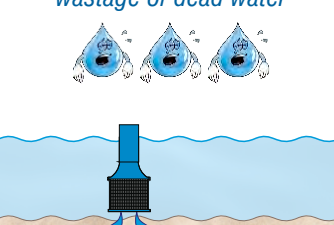
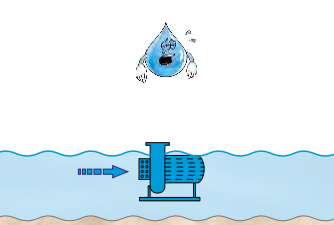


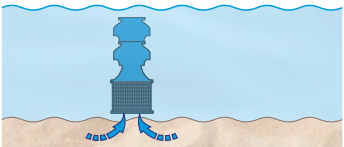
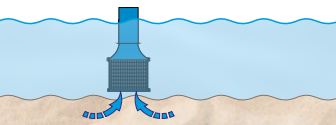
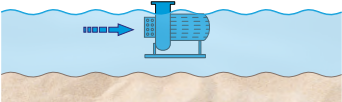
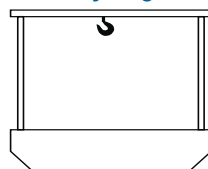
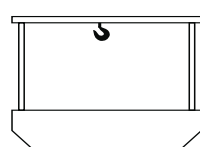
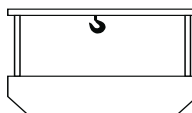
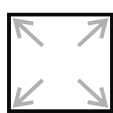
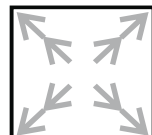
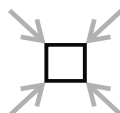
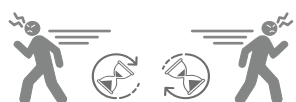
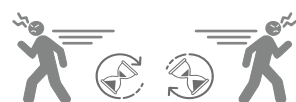
...Water Sprays !

(Frequently Emanating from Pipeline Leakages)

Why Submerged Pumps....?



	VT Pump	Horizontal Pump	Submerged Pump
Pumping CutOff Depth ...ability to Lift Dead Water 	 Very High ...due to Long Underhanging depth & Vertically Bottom Suction - huge wastage of dead water 	 High ...due to NPSHr Cavitations Problems & Vertical Bottom Facing Suction - Substantial wastage of dead water 	 Minimal ...due to Horizontal Side Suction & Minimalistic Underhanging Depth 

	VT Pump	Horizontal Pump	Submerged Pump
Risk of Toppling & Lateral Stability due to Lower Center of Gravity (CG) & Low Roll Center (LRC)	Much Above the Deck ...leads to pendulum like high amplitude oscillations  Highly Unstable ☠️	Above the Deck ...leads to mild oscillations  Unstable 😞	Below Deck ...so no oscillations  Stable 😊
Stability against Waves, Storms etc.	Highly Unstable ...leading to Chances of Toppling & Oscillating	Mildly Unstable ...having Some Chances of Toppling	Very Stable... ...no Chances of Toppling
Direction of Pump's Inlet Suction Flow	Vertical Bottom Facing ...leads to Undesirable Suction of Silt ☠️ 	Vertical Bottom Facing ...leads to Undesirable Suction of Silt 😞 	Horizontal Side Facing ...leads to Suction of Fairly Clear Water from Upper Strata. 😊 
Pontoon's Head Room requirement (for Lifting Hoist)	Very High 	High 	Medium 
Size of Pontoon	Bulky 	Very Bulky 	Compact 
Lubrication of Pumpsets	Forced Water Lubrication is Continuously required. ...is Very Costly & Very Complex to Operate & Maintain ☠️	Periodic Oiling &/or Greasing is required. ...is Costly & Tedious to Operate & Maintain 😞	Not required. 😊
Installation & Operating Manpower: Skill level required & Quantity	Ultra Highly Skilled ☠️ 	Highly Skilled 😞 	Medium Skilled 😊 
Conducive to Remote Operation	No ☠️ 	No ☠️ 	Yes 😊 
Need for Operator to go to Pontoon Frequently ...for Priming, Alignment of Shaft/Coupling; Gland Packing Replacement / Tightening; Valve Opening / Closing; Forced Water Lubrication; Re-Oiling, Re-Greasing; Sleeve Replacement; etc.	Yes ☠️ 	Yes ☠️ 	Not Required. 😊 

Operation & Maintenance		VT Pump	Horizontal Pump	Submerged Pump
Startup	Suction Priming	Not Required 😊	Mandatory tedious & requires the operator to go upto the pump during each startup; adds to overall Maintenance ⚠️	Not Required 😊
	Suction Vacuum Pump Operation during Pump Start			
	Need of Vacuum Pump/ Foot Valves			
	Time Consumed	15-30 mins*	15-30 mins*	approx. 5 mins.
	Ease of Operation	Very Cumbersome 😞	Cumbersome 😞	Very Easy
Risk of Bearings Damage (due to Water/Moisture Ingress)		High Risk ⚠️	High Risk ⚠️	No Risk (as bearings are sealed off by 2 mechanical seals)
Routine Maintenance	Recommended Mean Time between Maintenance of Gland : (Rope / Mechanical Seal)	approx. 15 days 😞	approx. 15 days 😞	5 to 7.5 Years 😊
	Recommended Mean Time between Alignment Check (if) & Maintenance of Couplings (if) & Shaft	approx. 30 days 😞	approx. 30 days 😞	Not Required
	Vibration & Noise Checking	Every Week 😞	Every Week 😞	Not Required 😊
	Suction Manifold Cleaning	Monthly 😞	Monthly 😞	Not Required
Periodic Maintenance	Spare Parts : nos./types of Spare Parts to be kept in Stock as per DIN 24296 for 2y of operation	42 nos. ⚠️	36 nos. ⚠️	12 nos.
	Bearing Re-Lubrication	Weekly/ Monthly 😞	Weekly/ Monthly 😞	30 to 60 months 😊
	Shaft Sleeve Replacement	Every 6 months ⚠️	Every 6 months ⚠️	60 months 😊
	Mean Time Between Replacement of Bearings	approx. 2 Years 😞	approx. 2 Years 😞	at least 15 Years
	Discharge Valves Maintenance	Every 4-6 months		
Operational Energy Cost (kW/hr)		100%*	100%*	98.5% to 96.5%
Pumping Plant Load Factor (PPLF)		~0.75*	~0.74*	~0.98*
Cumulative Water Actually Dewatered in LifeTime		100%*	101%*	~133%*

Aqua Machineries Pvt. Ltd.

www.aquapumps.com

Registered Office & Manufacturing Plant

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