



TATA Steel Sukinda Chromite Mine

# ONE OF INDIA'S LARGEST CHROMITE MINE

## SUKINDA | ODHISHA

Sukinda Chromite Mine in Odisha's Jajpur district has become the first mine in India to roll out a pilot project on Sustainable Development Framework, a concept proposed and promoted by Union Mines Ministry for the development of culture of sustainable mining.

Tata Steel operates one of India's largest chromite mines at the Sukinda Valley in Odisha producing chrome ore which is subsequently converted it to Ferro Chrome and sold to customers across the world -Odisha accounts for about 98% of the total proved chromite (chromium ore) reserves of the country, of which about 97% occur in the Sukinda Valley. The valley is abundant in the deposits of chromite and has the largest open cast chromite ore mines in the world.



## Project Data :

- **User** : TATA Steel Ltd.
- **Project** : Sukinda Chromite Mines, Odisha
- **Pumpsets** : *Submerged Mine Dewatering Pumpsets*
  - 600 m<sup>3</sup>/hr flow x 140m head @ 355 kW (3300V)
  - 175 m<sup>3</sup>/hr flow x 145m head @ 130 kW (415 V)

## Earlier pumping methodology :

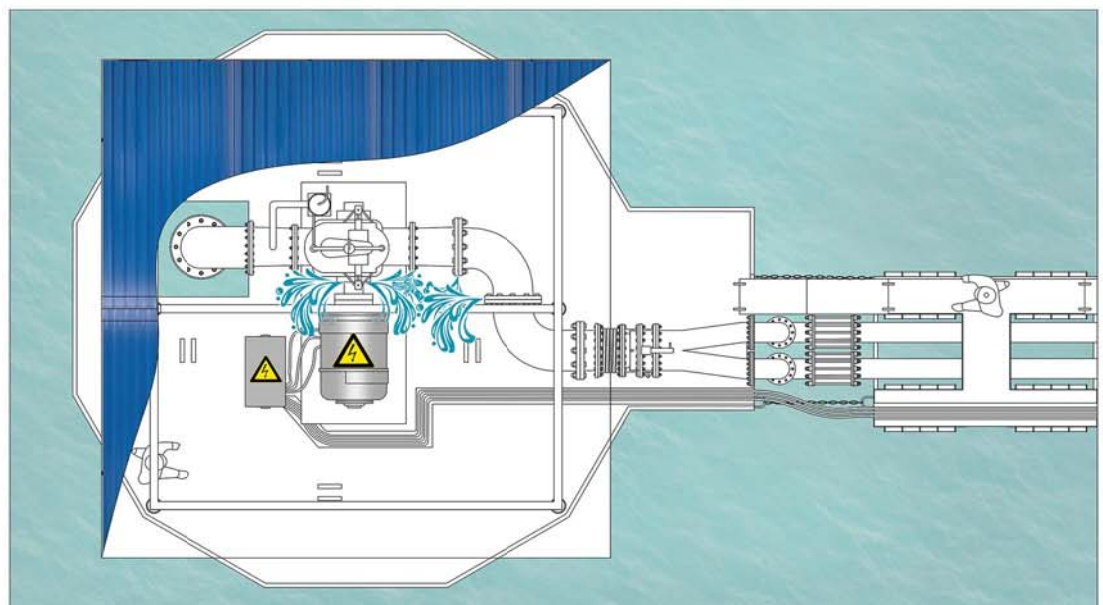
Tata Steel Ltd. (TSL) were using Horizontal Centrifugal Pumpsets for TWO stage dewatering system. TSL did 80m pumping through Centrifugal Pump on floating pontoon and put another Booster Inline Centrifugal pump to push water for balance (further) 60m .

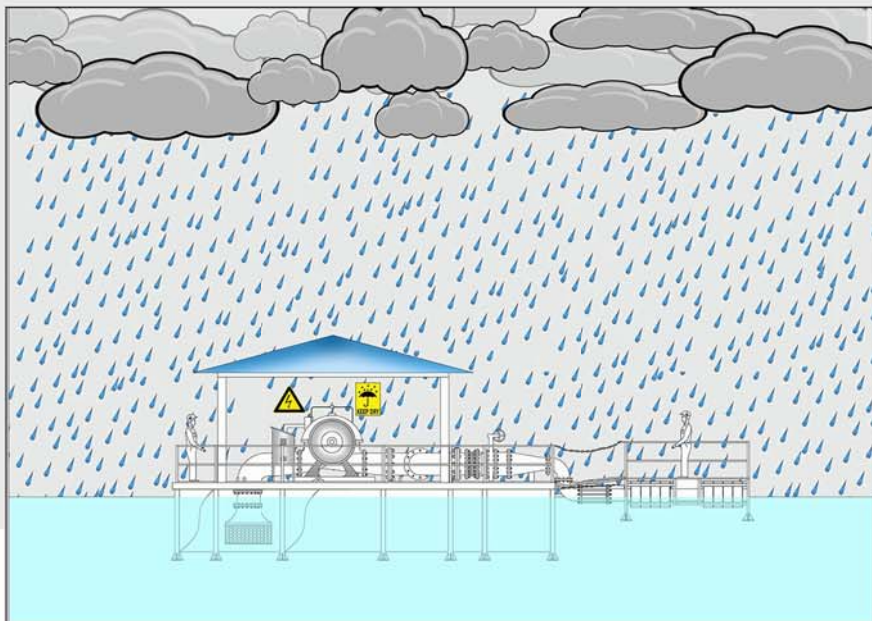
TSL were facing major problems in Priming & Maintenance & had to depute dedicated staffs. Due splashing, rain, gland leakage of water & unbalanced load of Bare Shaft Horizontal pumpset mounted above pontoon; the floating pontoon was frequently tilting on one side.

In monsoon & heavy rain fall, operating of floating pontoon centrifugal pumpsets were difficult & also needed to covered motor through roof top.

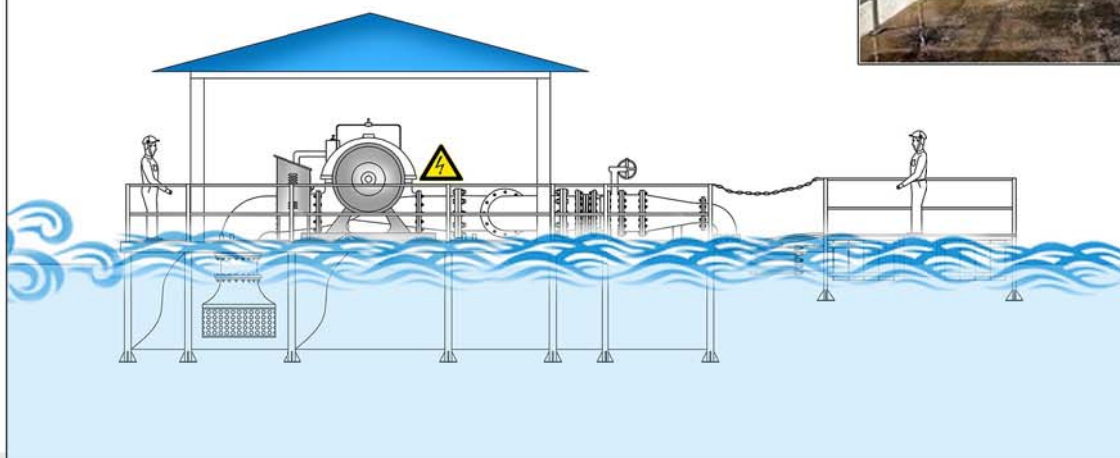
Centrifugal pump motor's misalignment caused heavy vibrations & required frequent Bearings & Gland Maintenance.

***HSCF pumpsets have Leaking Glands while Pipe Joints will develop leakage at Gaskets which necessitate IP 68 Sealed Motors***

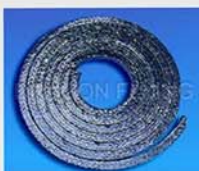
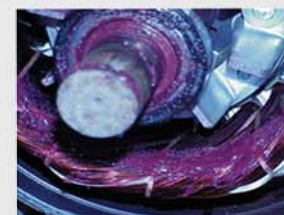




**No need of Operator to Prime the pump  
No need to go to the Pontoon...!**



*Gland packing require Routine maintenance at every 200 to 500 hours in case of HSCF pumps*



## The Situation :

A large quantity of water, generated during mining due to seepage of ground water & also due to rainfall, needs to be handled during the mining operations.

The Sukinda Valley experiences about 110 cm to 180 cm of rainfall annually, of which 80% of the rainfall is during the monsoon season i.e. between June and September. Groundwater is a common problem when mining, and developing a mine below groundwater level presents many challenges. Poorly controlled seepage & groundwater will have negative impacts on the safety, efficiency and economics of mining operations. To continue the mine working below water table & with the mine working going deeper the water inrush due to seepage is likely to go up.

## AQUA's Solution :

Aqua has offered single stage pumping solution by supplying 140-145m submerged pumpsets for mines dewatering.

TSL has installed AQUA Submerged Mine Dewatering Pumps on floating pontoon and doing pumping throughout tail end without any Booster/ Relay pump.

Supplied MS Fabricated floating pontoons are robust in design & as the Submerged Mine Pumpsets are below the pontoon; its Centre of Gravity is lowered. The weight of pumpset has shifted to downwards centre of pontoon & ensure stability.

Due to Submerged type pumpsets, no priming & superior staff required. TSL has saved copper cable laying, Control Panels, multiple piping, valves, man power etc cost.

TSL also observed marginable cost saving in maintenance expenditure.



### Low Energy Cost

Wire to Water efficiency is at par with Centrifugal pumps & substantially higher than Water/ Oil filled Submersible, Polder/ Borewell pumps



### User Friendly

Compact, Fully Portable & Flexible - can be installed either Vertically or Horizontally or Inclined



### Low Life Cycle Costs (LCC)

Highly Efficient, Minimal Maintenance, extremely Low Consumables and spare part requirements; Low down time



### Plug & Pump

No base Plate, Coupling to align; No priming to startup



### Robust & Reliable

Over-safe Design & Smart Protection Systems result in high Reliability



### Maintenance Free

Requires No Consumables or Routine maintenance (No Priming, Oiling, Greasing, Gland Tightening, Shaft Alignment)



### Weather Proof

No risk of cavitations - No damage due to Rains Withstands wide temperature variation (-5°C to 60°C)



Being safely tucked away **under water**, Submerged pumpsets are exposed to **Lower Risks of damage by Flying Debris loosened during blasting & excavation**



3.3kV 450kW 2stage SubVT pump on Pontoon\*  
Clients has decommissioned HSCF pump#



Date: 24/11/2017

### TO WHOM IT MAY CONCERN

This is to certify that we are using Aqua make Submerged Turbine Pump set model ASS\_H\_PS\_2st\_BO\_2552\_M\_M\_0475\_03300\_NJ, Sr No 26561, rated for flow 600 m<sup>3</sup>/hr x 140 m Head with 355 kW ,3.3kV HT Motor.

The said pump set has installed on the Pontoon thereby being Submerged & are running smoothly. As compared to the earlier used centrifugal pump sets, this submersible pump is simple to operate and maintain. The more advantage is that no priming is required and giving satisfactory performance since then.

FOR TATA STEEL LTD

  
24/11/2017  
Sr. Manager (Electrical)  
Sukinda Chromite Mine



MINING



AQUA Submerged Mine Dewatering Pumpsets is simple & easy to operate, robust in design, almost nil O&M spares

# AQUA MACHINERIES PRIVATE LIMITED

[www.aquapumps.com](http://www.aquapumps.com)

## Registered Office & Manufacturing Plant

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### Customer Support - [All India]

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