



PROBLEM IN EFFLUENT TREATMENT PLANT IN FLOCCULATION TANKS AND ITS TROUBLE SHOOTING BY CARRIED OUT STUDY ON VARIOUS PARAMETER OF CETP WATER MLSS,MLVSS,COD,BOD & REDUCING TSS AT TPI INLET.

Environmental Science

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ABSTRACT

Effluent treatment plant is the garbage box of refinery which treats the refinery wastage from all across. The Refinery has been playing a catalytic role in encouraging over 200 small and big industries over the course of five decades. Petroleum refineries separate crude oil into a wide array of petroleum products through a series of physical and chemical separation techniques. These techniques include fractionation, cracking, hydrotreating, combination/blending processes, and manufacturing and transport. The refining industry supplies several widely used everyday products including petroleum gas, kerosene, diesel fuel, motor oil, asphalt, and waxes. The petroleum refining industry has a significant influence on the total pollution of the environment by industrial discharges and wastes. Environmental Pollution is a topic of great concern in the present conditions prevailing in the rural as well as urban India. Effluent which was collected from Equalization tank is routed to flash mixer and flocculation tank where chemical treatment is done for removal of emulsified oil and suspended solids. The effluent from flash mixer splits into two streams at flocculation tank (100- T-04 A/B). But sludge accumulation was always there in the flocculation tank, 100- T-04 B. To prevent or overcome this problem to overcome this problem RPM of Agitator (02 B) was increased. Rotation of agitator 02 B was reversed. Inlet sluice gate of both the flocculation tanks were opened 100 %. Stoppage of recirculation of effluent from Flocculation tank to surge sump for optimization of chemical dosing and reduction of load at surge sump. Oil skimming started from surge tanks which improved oil recovery efficiency of CETP. Reducing various high TSS streams being recirculated at CETP (Centrifuge, Surge tank skimming, FT recirculation stopped, Bio thickener).

KEYWORDS

Effluent, Petroleum, equalisation tank, flash mixer, Flocculation, sludge, agitator, skimming, optimisation, TSS, surge tank, efficiency.

ETP Plant plays a very important role for treating the industrial wastewater. ETP are mostly used to treat the industrial wastewater to make it reusable water or to safely discharge it to the environment. It will play a role of kidney which purifies the impurities of refinery. There are different types of environmental pollution such as air, water, noise, soil etc. these pollution types pose a great threat to the human life as well as of the flora and fauna. Amongst them, water pollution is a serious problem witnessed in the developing regions where many small-scale industries, medium scale industries as well as large scale industries.

Approx capacity of water used for cooling and other refinery process is 1.5 times of total refining capacity of refinery throughput. Any treatment of industrial waste and wastewater is mandatory for now by the circular of state governments. Gujarat Refinery is having their own CETP plant having capacity of 1500 M³/Hr. consisting of physical, chemical, biological & tertiary treatment facilities. Various measures have been adopted for control of gaseous emissions. Water conservation is another important area being vigorously taken up in refineries through its quality control, re-use of treated water and maximum use in cooling systems. And also as per the Water Act of 1974 and its subsequent amendment in 1988.

An ETP is therefore designed to remove the physical, chemical and biological materials present in the effluent. Depending on the level of treatment the wastewater requires, an ETP is divided into four different levels each designed to remove a certain type of material in the effluent.

These industries were compelled to meet the stringent effluent discharge norms set up by the CPCB and the SPCBs.

We have a problem in ETP flocculation tanks and its trouble shooting: Problems area

Presently effluent from Equalization tank is routed to flash mixer and flocculation tank where chemical treatment is done for removal of emulsified oil and suspended solids.

The effluent from flash mixer splits into two streams at flocculation tank (100- T-04 A/B).

But sludge accumulation was always observed in flocculation tank, 100- T-04 B.

Action Taken To Overcome This Problem

- RPM of Agitator (100-AG-02 B) was increased.
- Rotation of agitator (100AG-02 B) was reversed.

- Inlet sluice gate of both the flocculation tanks were opened 100 %.



Before Photograph



After Photograph

Other Operational Improvements

- Stoppage of recirculation of effluent from Flocculation tank to surge sump for optimization of chemical dosing and reduction of load at surge sump.
- Oil skimming started from surge tanks which improved oil recovery efficiency of CETP.
- Reducing various high TSS streams being recirculated at CETP (Centrifuge, Surge tank skimming, FT recirculation stopped, Bio thickener).
- Proper monitoring of Plant operations particularly during water draining operation from RO tank
- Slop tank temperature is being maintained at >60 °C for better water separation.
- Melting pit operation has started i.e. 3 melting pits / day resulting in emptying of sludge lagoon 02 A.



Before Photograph



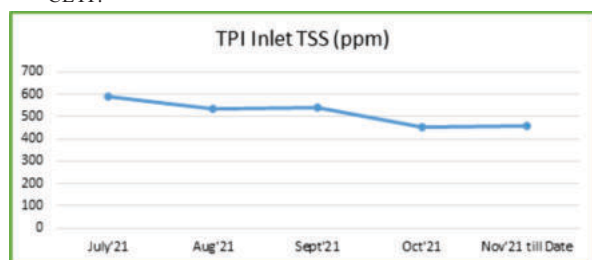
After Photograph

Benefits Achieved

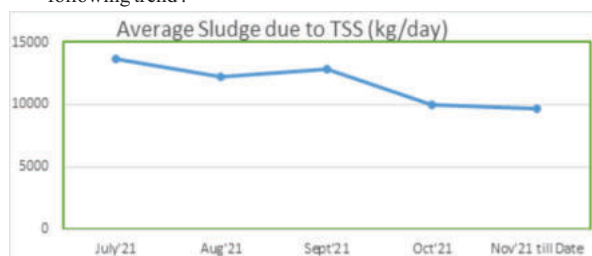
With all the above actions, following operational improvements are observed:

- i) Improvement in TSS as TPI I/L achieved by eliminating various sources of high TSS streams which were being recirculated in

CETP.



ii) Sludge generation from DAF at CETP has reduced. Refer the following trend :



- iii) Sludge stock has reduced even though CETP is processing sludge from other sources :
- iv) approx. 110 m3 from GHC offsite tank 29-TC-01D.
- v) Sludge from Tk-803, approx. 80 no of gully suckers are unloaded in melting pit so far.
- vi) Used transformer oil from various sources.
- vii) Spent lube oil from various units.
- viii) Sludge level at Lagoon -02 A has been reduced to minimum. Sludge levels at Lagoon-01 B also reduced.

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