

WATER CONSERVATION & REDUCTION IN EFFLUENT GENERATION THROUGH CHANGING COAGULANT REGIME.

❖ Existing PT Plant Process :

JSW Energy (Barmer) Limited has a Pre-Treatment plant (PT plant) to treat raw water to meet the certain quality parameters of water which is required for the operation processes & services and drinking water. Barmer, Rajasthan is a water stressed region.

Approx. **60000 M³ per day** raw water is consumed in the plant and **9000 M³ per day** effluent water is generated from Cooling Water Blow down. This blowdown effluent is further treated in Effluent Treatment Plant (ETP-RO) and re-used in the plant. Major quantity of Pre-Treated water is consumed in the Cooling water cycle of the condenser where the water is circulated through the Cooling tower. Due to the **high Chloride concentration i.e** cycle of concentration(COC) maintained which is 7, it increases the Blow down water(effluent) and subsequently the make-up water quantity is also increased.

For the treatment of raw water, we add Poly Aluminium Chloride (PAC – Chlorine content 33%) in the PT plant as a Coagulant to reduce suspended solid & Turbidity. During this process chloride is increased in treated water by around 5 PPM (8%) which in turn, due to the presence of chlorides, leads to increase Cooling Tower Blowdown by approx. **700 M³ /day** extra.

❖ Innovation :

It was decided to carry out Pilot Project to utilize a coagulant in the PT plant process, which is not chlorine based and subsequently, Aluminium Sulphate was shortlisted. The first trial was taken in the plant laboratory to set the optimum PPM dosing and suitability of the chemical. Thus, Aluminum sulphate (Non-Ferric) was used in Pre-Treated water instead of existing Chloride based Poly Aluminum Chloride (PAC). It was concluded that **5 PPM (8%) chloride** can be reduced by using Aluminium Sulphate instead of PAC as a coagulant for the water being supplied to the CW make-up point without modification in the existing dosing system.

❖ Tangible Benefits – Water saving through reduction in CW Blow Down :

About 2.77 lacs M³ water saved from last year consumption (FY22-23), with continuous application the reduction in blow down effluent increased to a steady level The tangible benefits accrued are also calculated and provided below. The above modification decreased CW Blow down to approx. 761 M³/day (9%).

- ❖ Intangible Benefits** - 1. Reduction effluent water Generation (reduces by approx. 700m³/day)
- 2. Reduction in Effluent Treatment plant load & Operation/chemical cost