

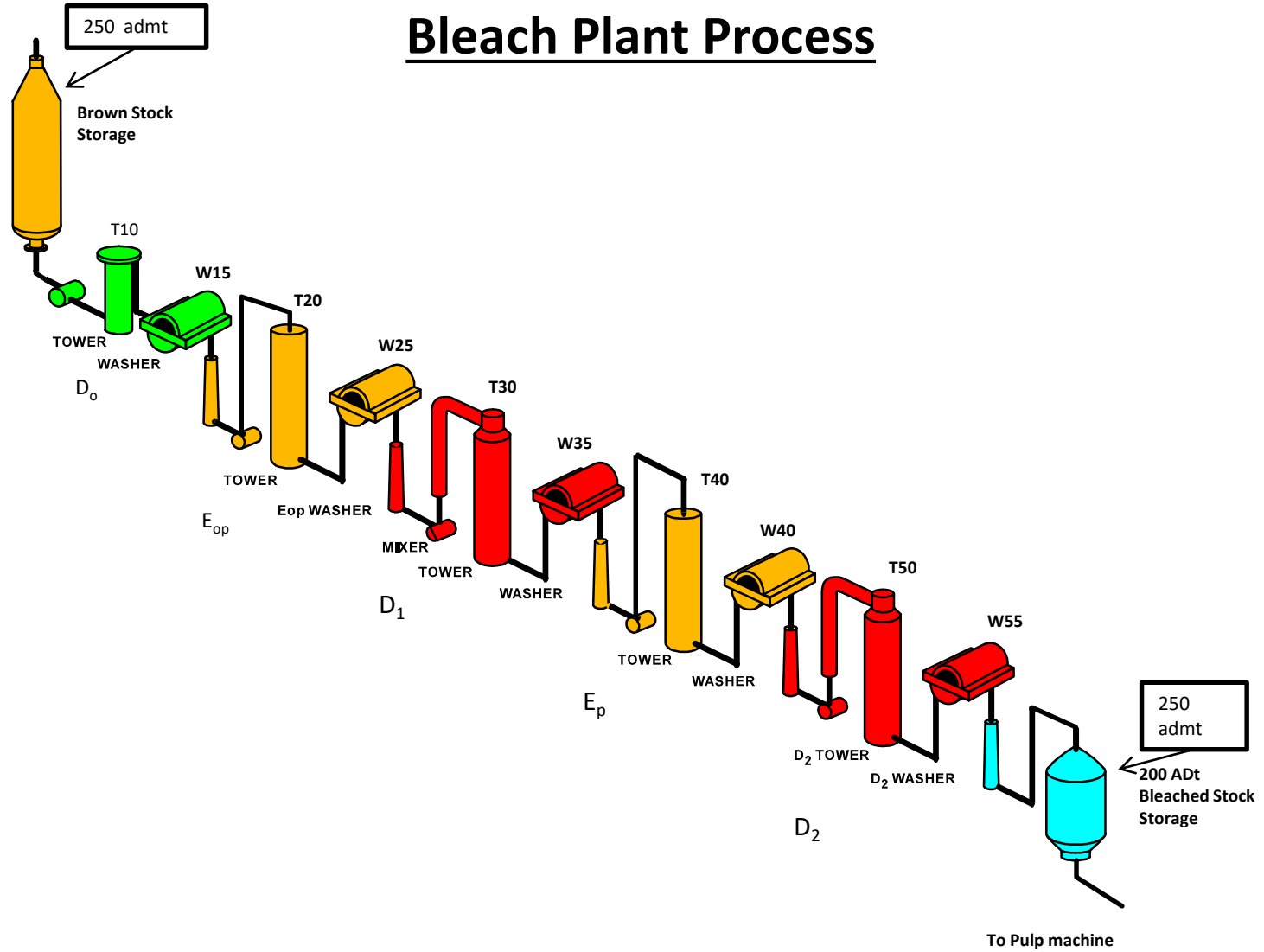
Bleach Control Project With TEXO

**By: John Shao Skookumchuck Pulp Inc.
Laurier Morissette TEXO**

Mill

- Skookumchuck Pulp Inc. is built in 1968
- It is currently owned by Paper Excellence since 2013
- The mill produce 260,000 tones NBSK with brightness 87+ISO every year
- The wood species are SPF with Fir/Larch
- The bleach plant has five stages of $D_oE_{op}DE_pD$
- The bleach plant was originally designed at a rate of 380tpd, and upgraded to 750tpd. Higher rate reduce the stock retention time in the bleach towers, and thus the bleaching efficiency.

Bleach Plant Process





T50 (D₂)
681m³
145 mins

T40 (E_p)
474m³
100 mins

T30 (D₁)
681m³
145 mins

T20 (E_{op})
474m³
100 mins

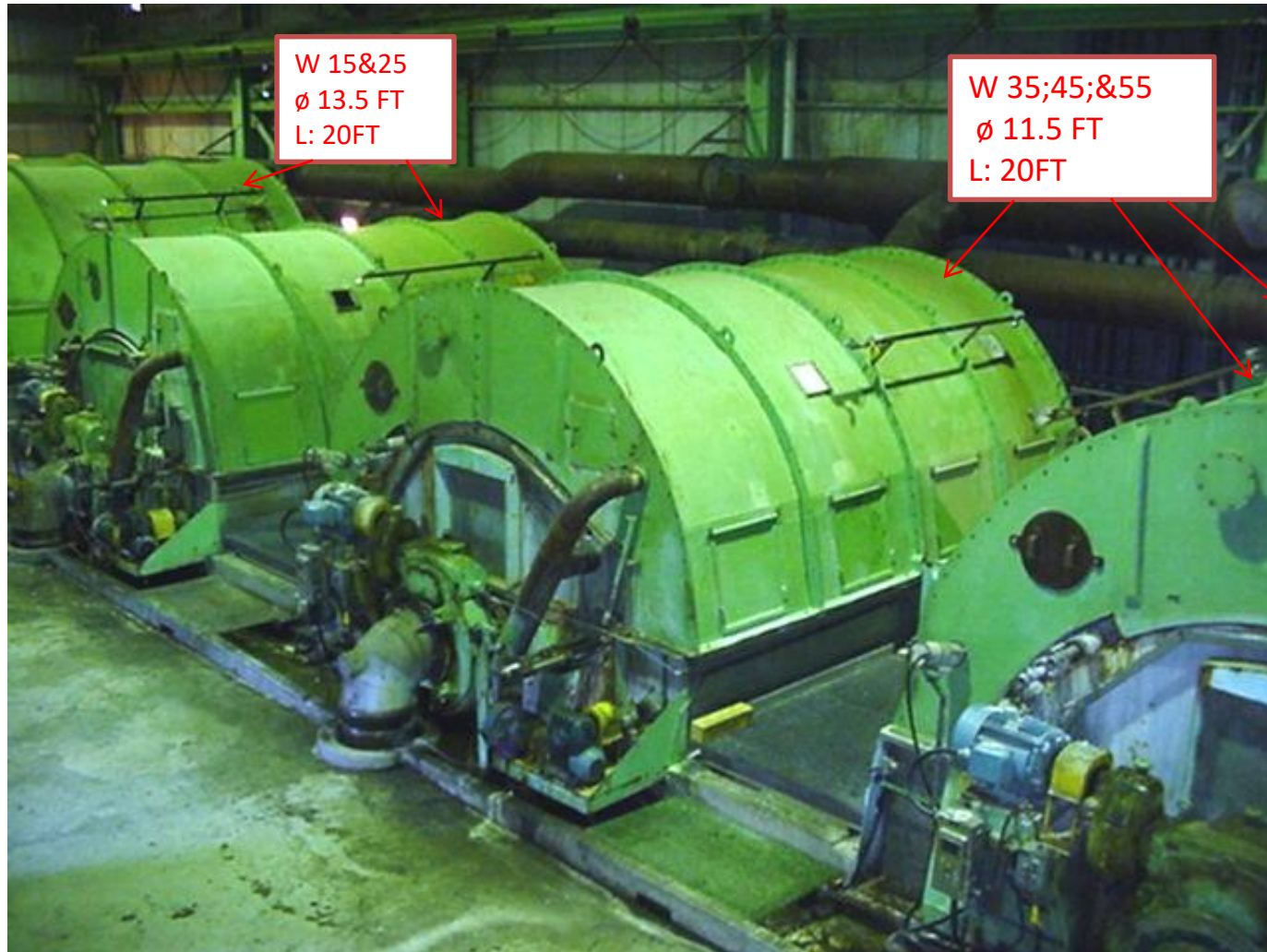
T10 (D_o)
575m³
41 mins



Controlling and Testing

- In-line measurements of pH; temperatures; kappa into D0 and out of Eop; brightness out of D1 and E2.
- The brightness; pH; and residuals are tested by the bleach operators twice a shift.
- Bleaching stages of D_0 and D_1 are kappa feed forward controlling.

Bleach Plant Washers





Background of the Project

- ClO₂ dosage to Do was controlled by the stock kappa in the bleach front. It is the feedforward control, and there is not any feedback control.
- ClO₂ dosage to D1 was controlled by the stock kappa out of the Eop stage.
- Alkali dosages to both extraction stages Eop and Ep are controlled with inlet pH to the towers.



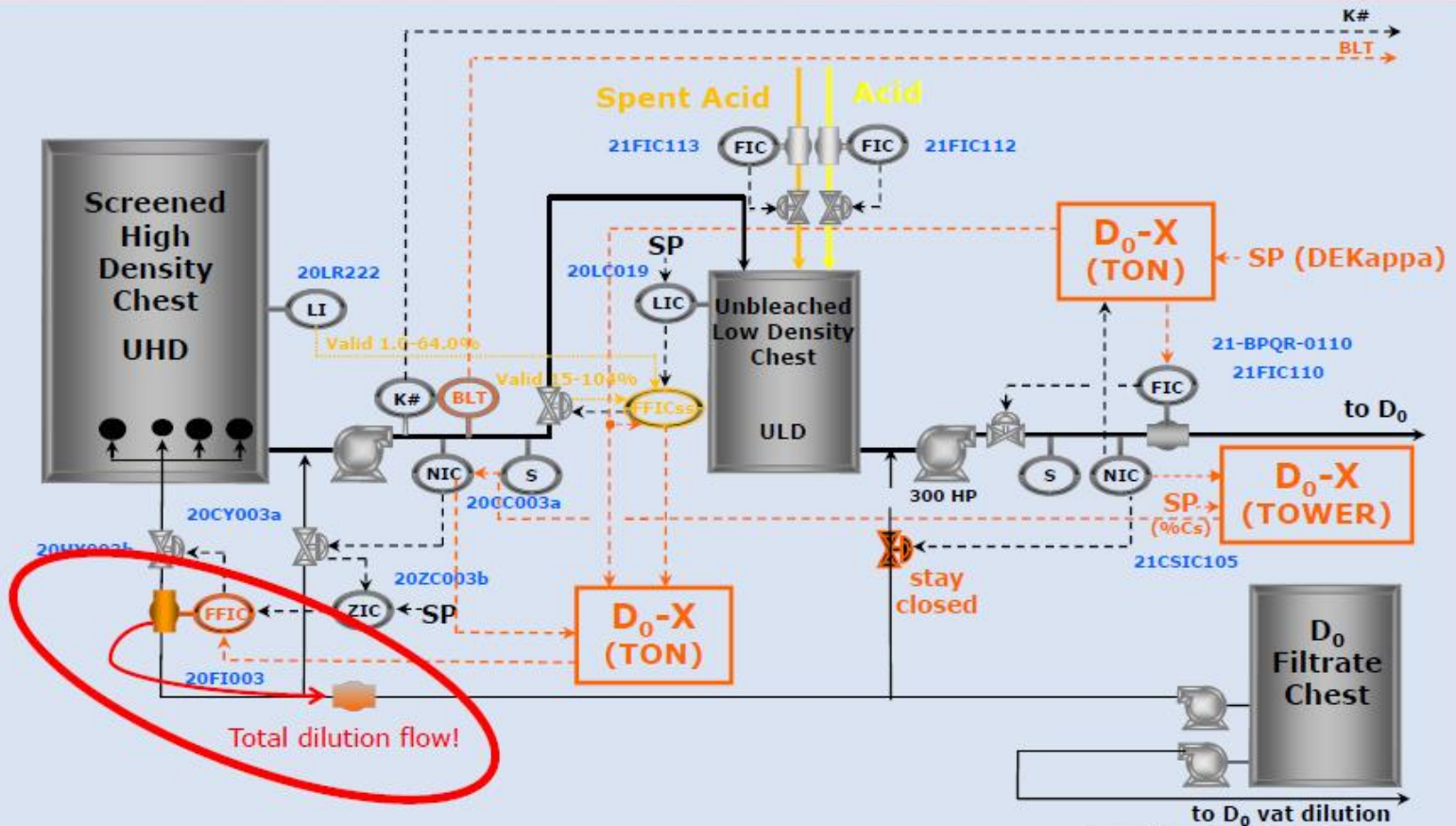
Background of the Project (Cont')

- The bleach plant rate was calculated by the feed flow and consistency into the Do stage, and chemical dosages adding to the other stages are based on this rate and chemical dosages.
- The level variations of bleach towers caused the chemical dosages either higher or lower than the targets. The results would be lower brightness off grade, or chemical waste on the over bleached pulp.

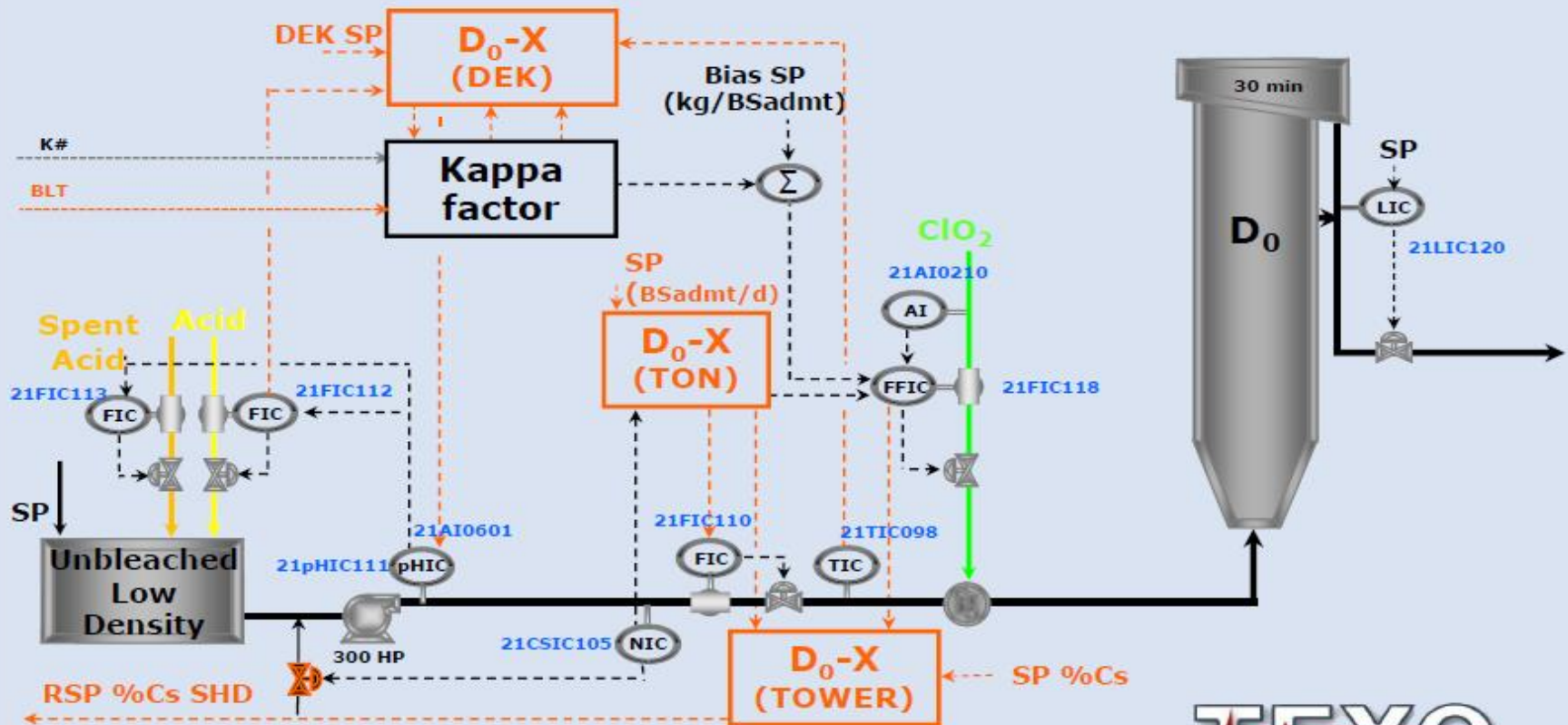
Bleaching Control Project

- TEXO proposed a bleaching control project, and it includes three parts
 1. Consistency control into the Do stage
 2. The kappa control program in D0 and Eop stage
 3. The chemical dosage/stock rate control in the following stages include D1, Eop, and D2

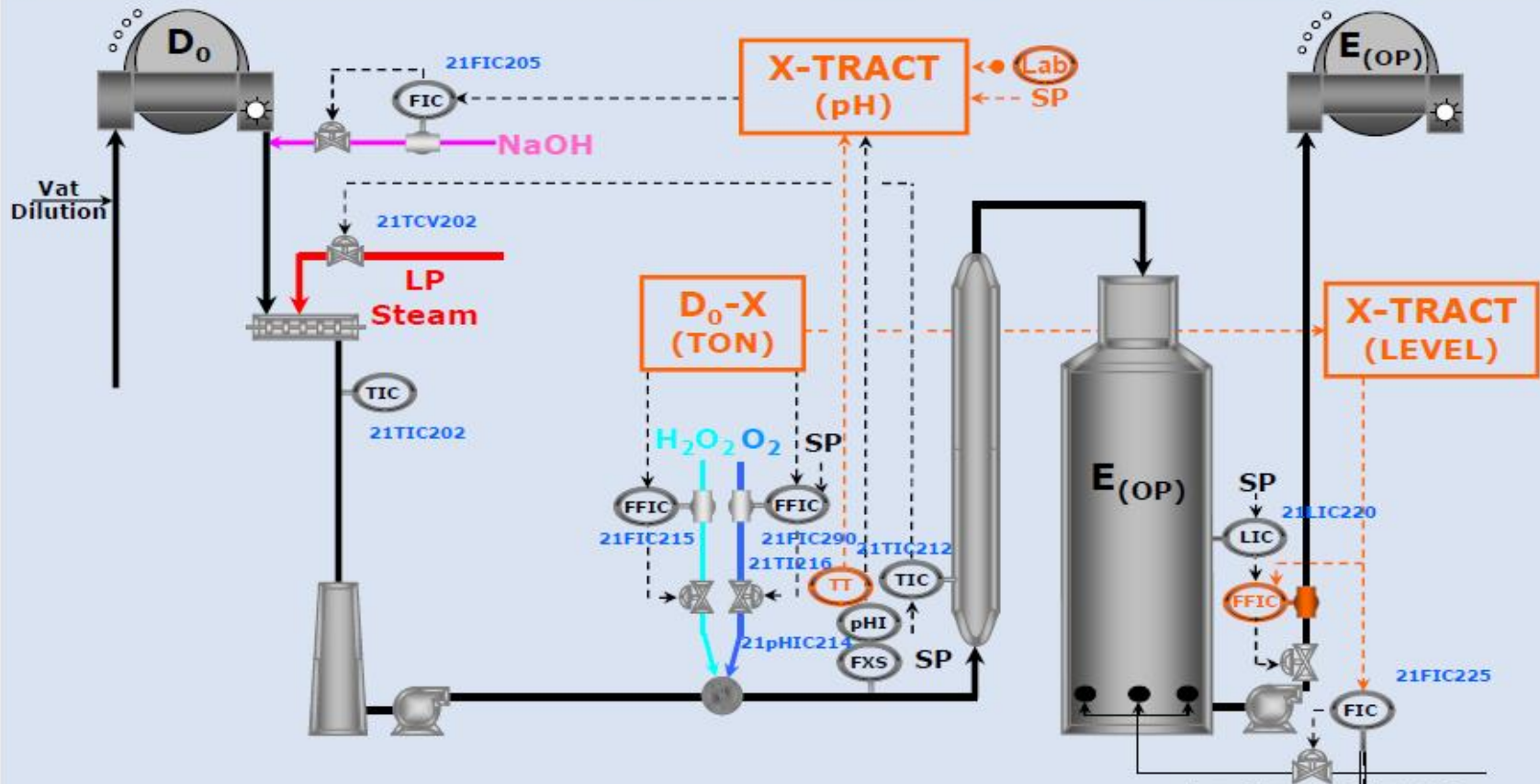
SHD & ULD – proposed



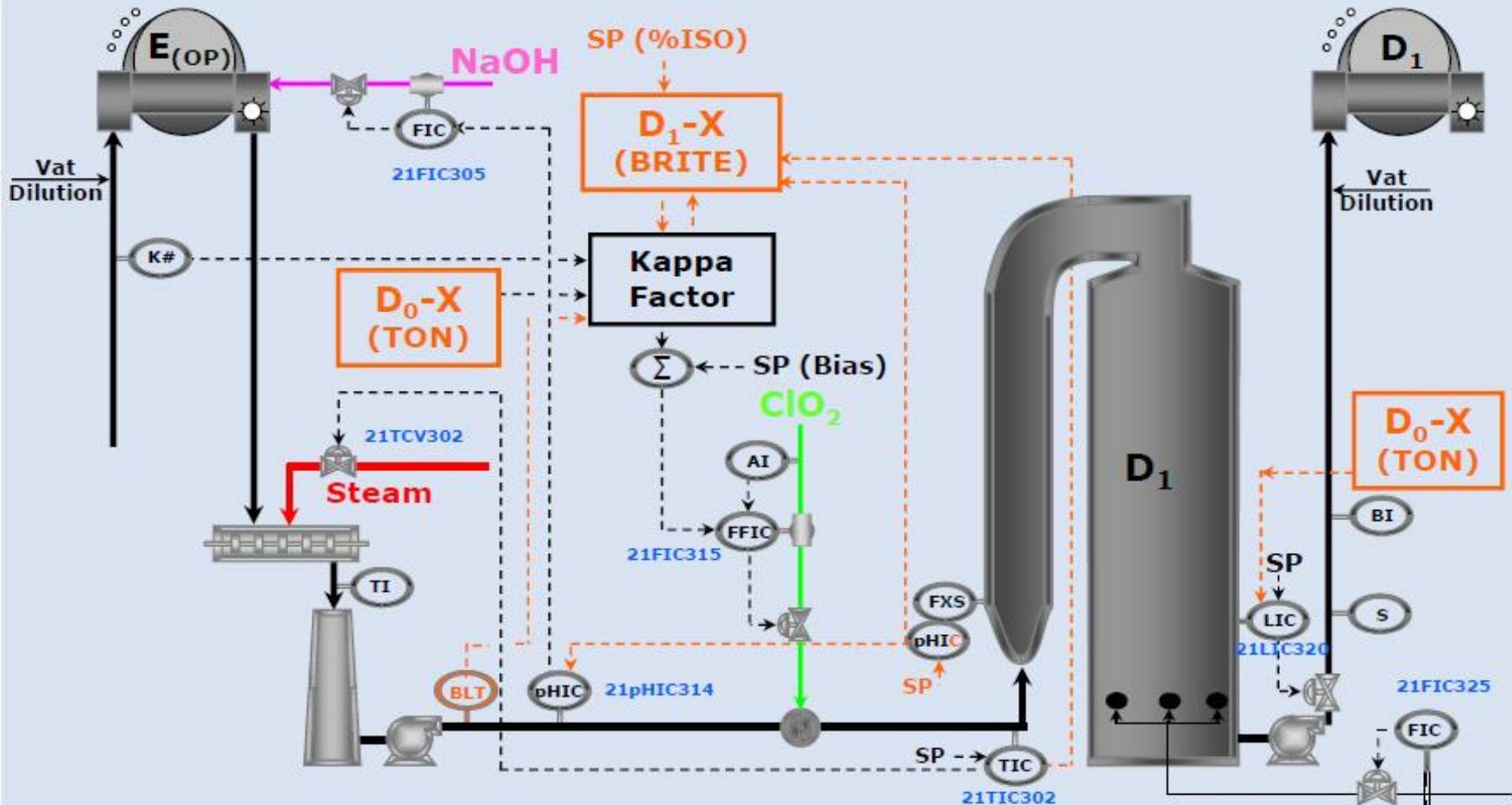
D₀ Stage Control – proposed



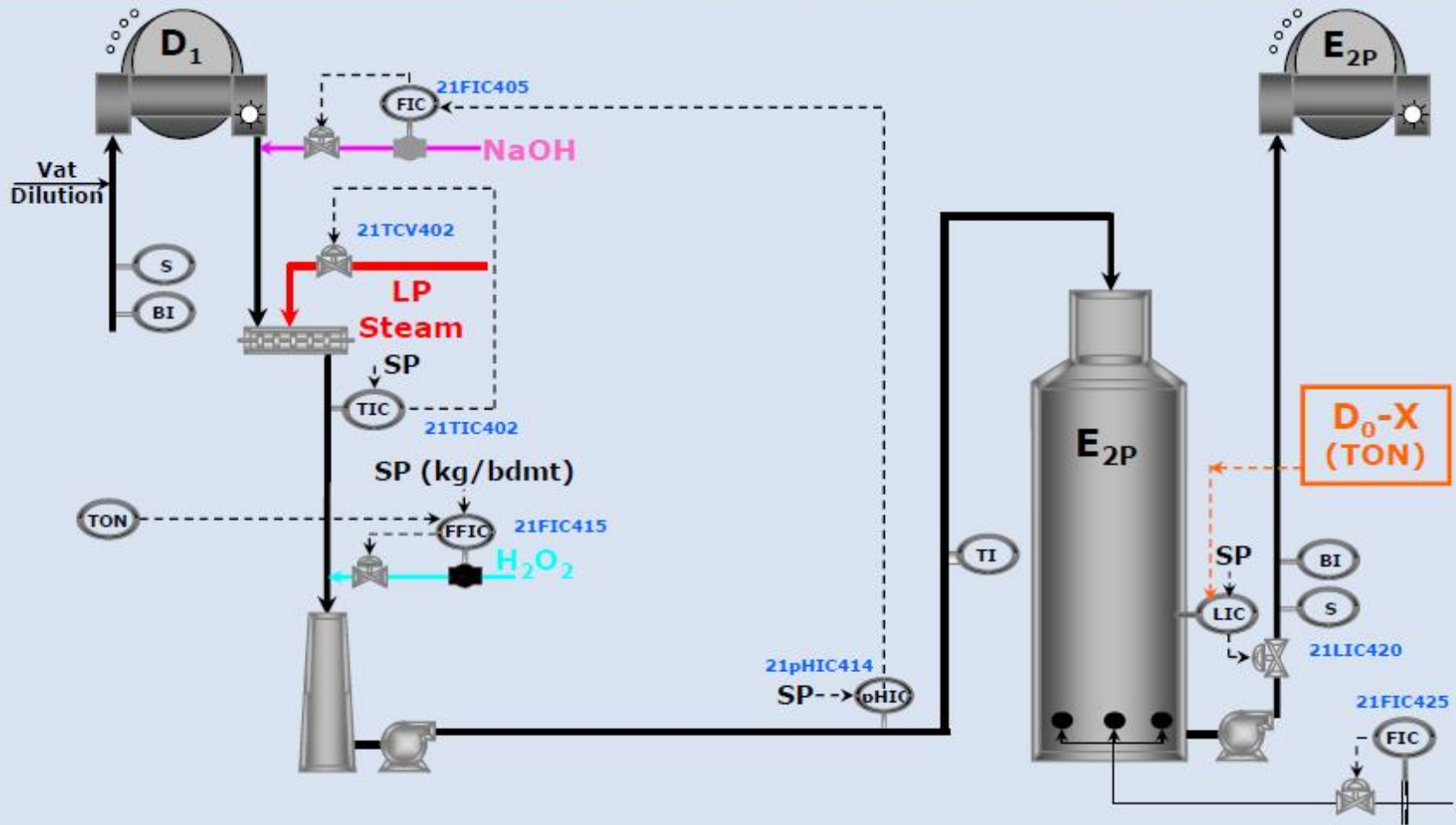
$E_{(OP)}$ Stage Control – proposed



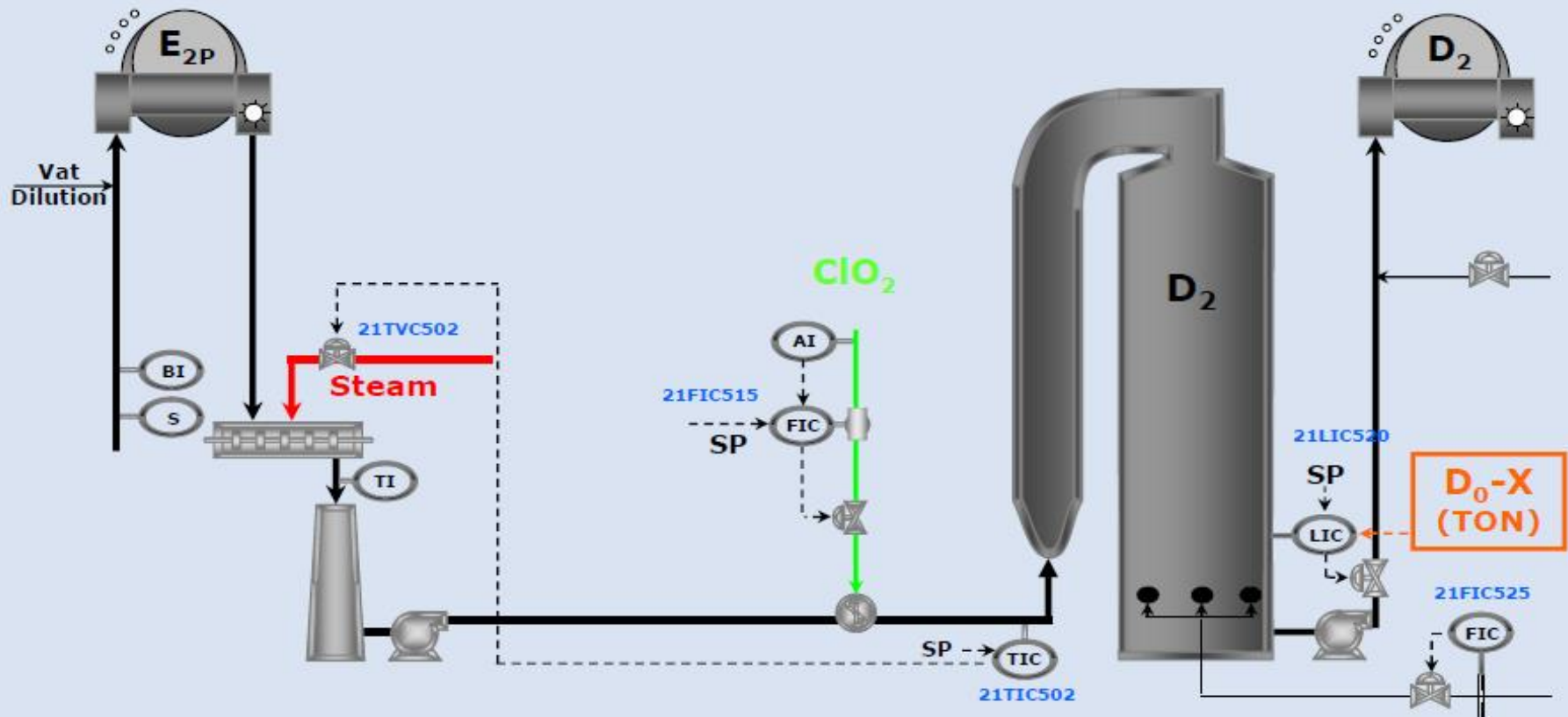
D₁ Stage Control – proposed

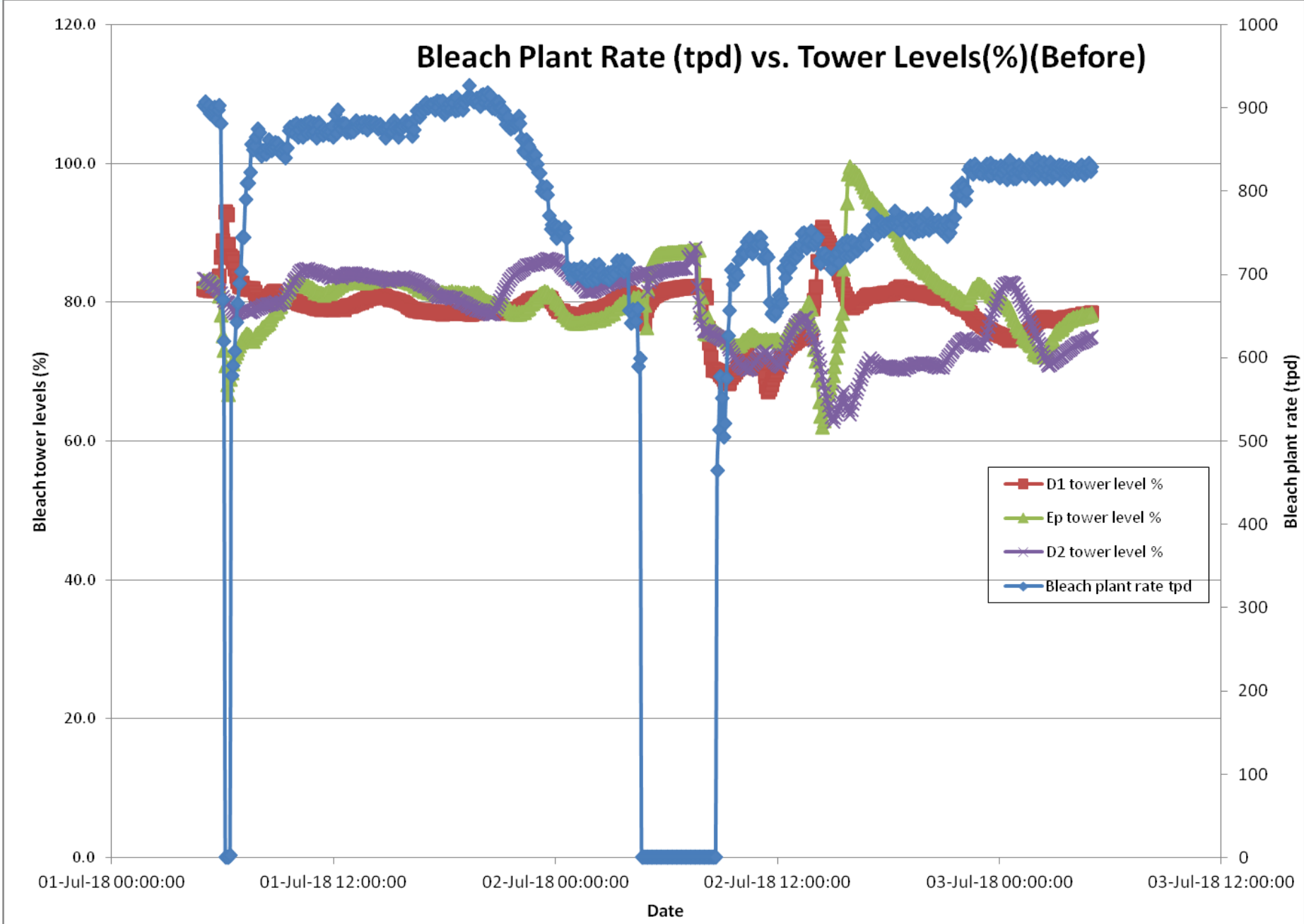


E_{2P} Stage Control - proposed

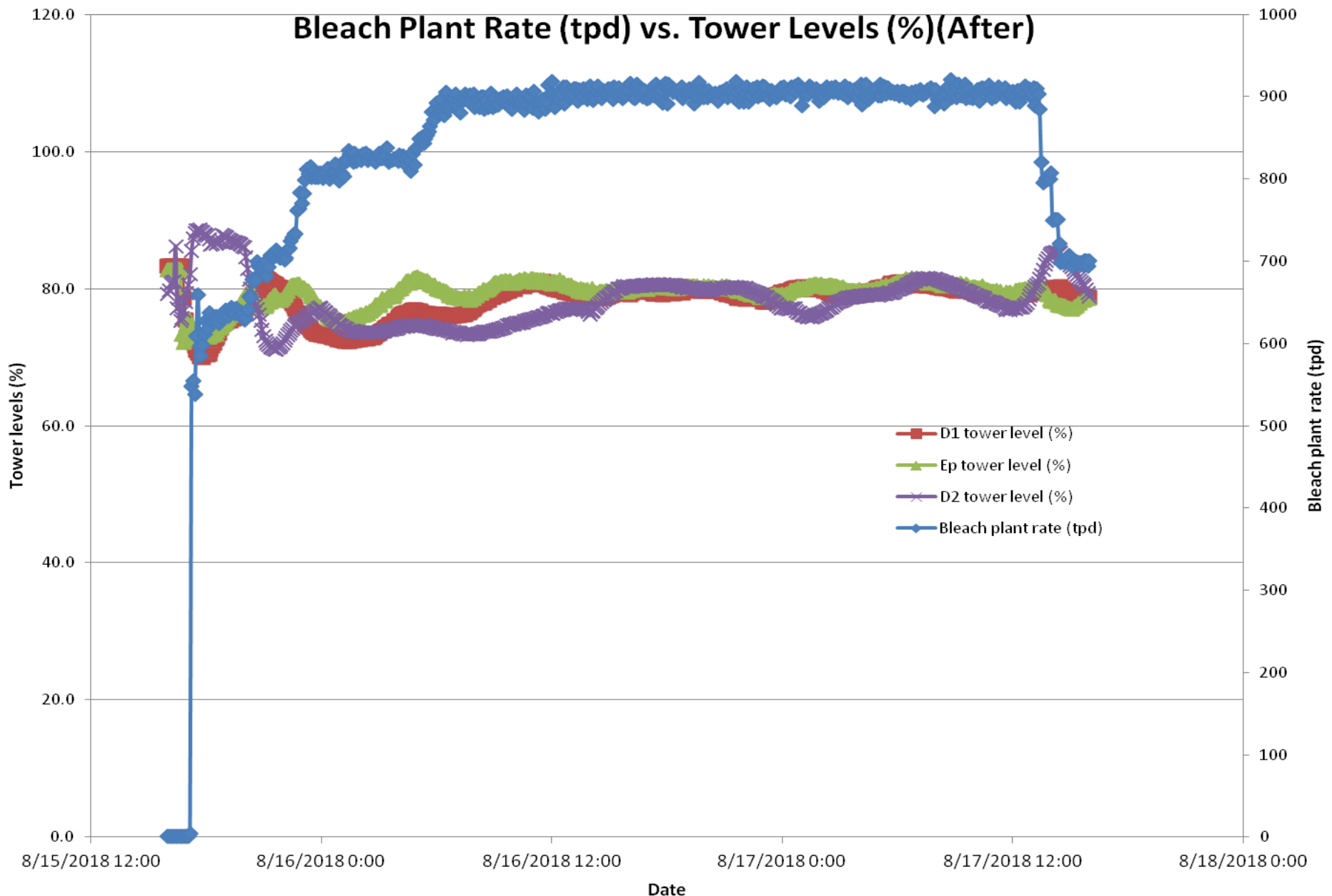


D₂ Stage Control - proposed

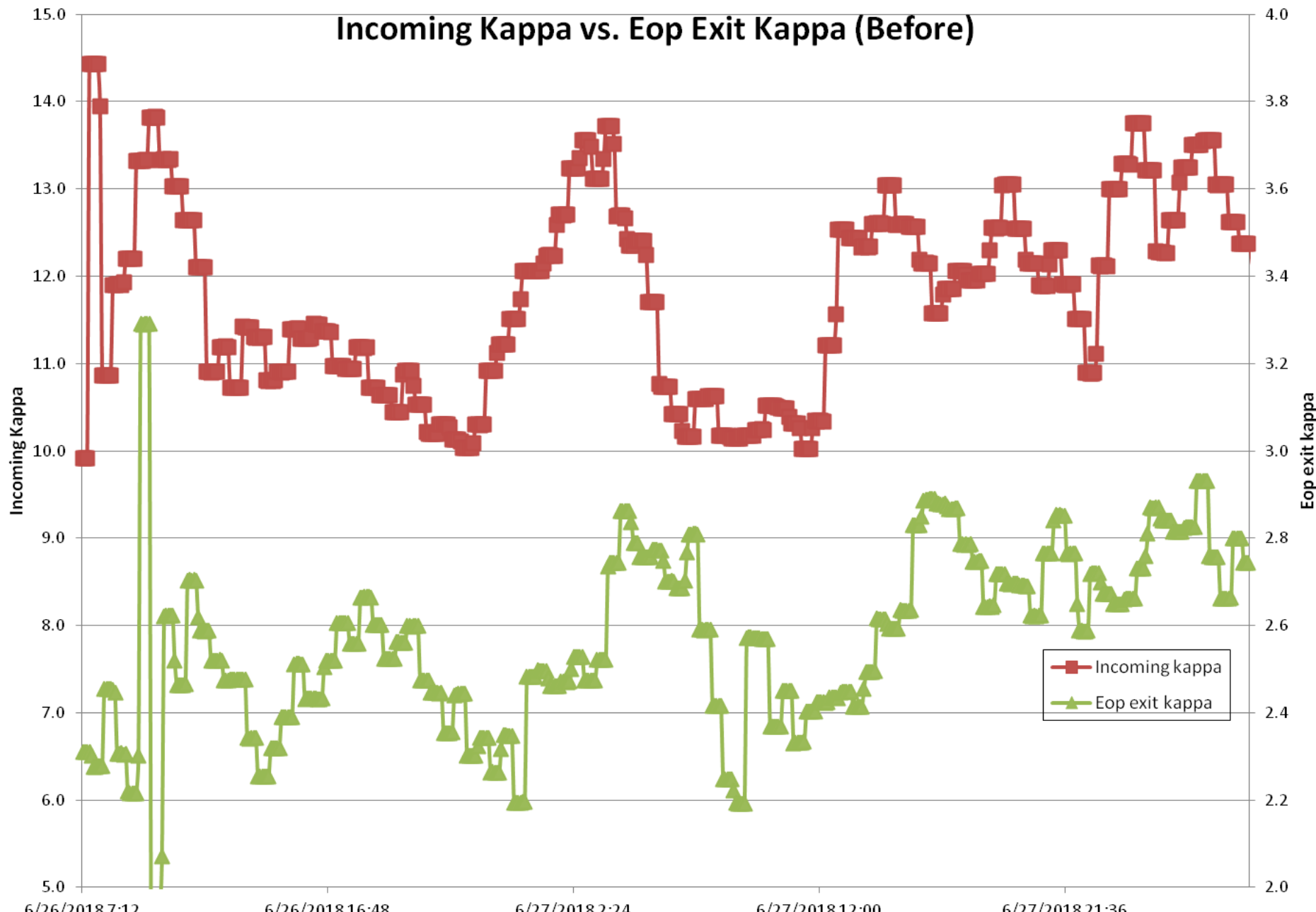


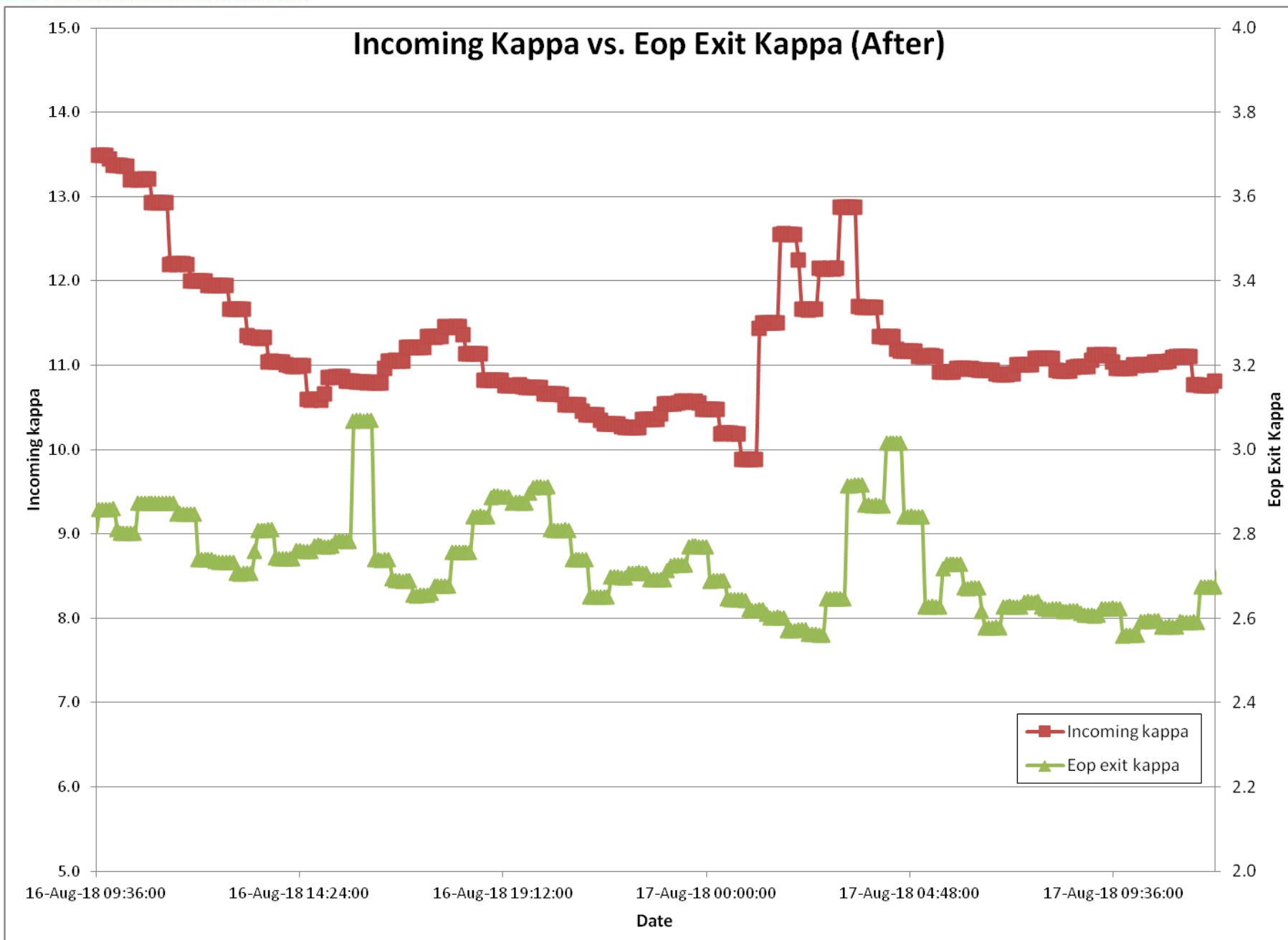


Bleach Plant Rate (tpd) vs. Tower Levels (%) (After)

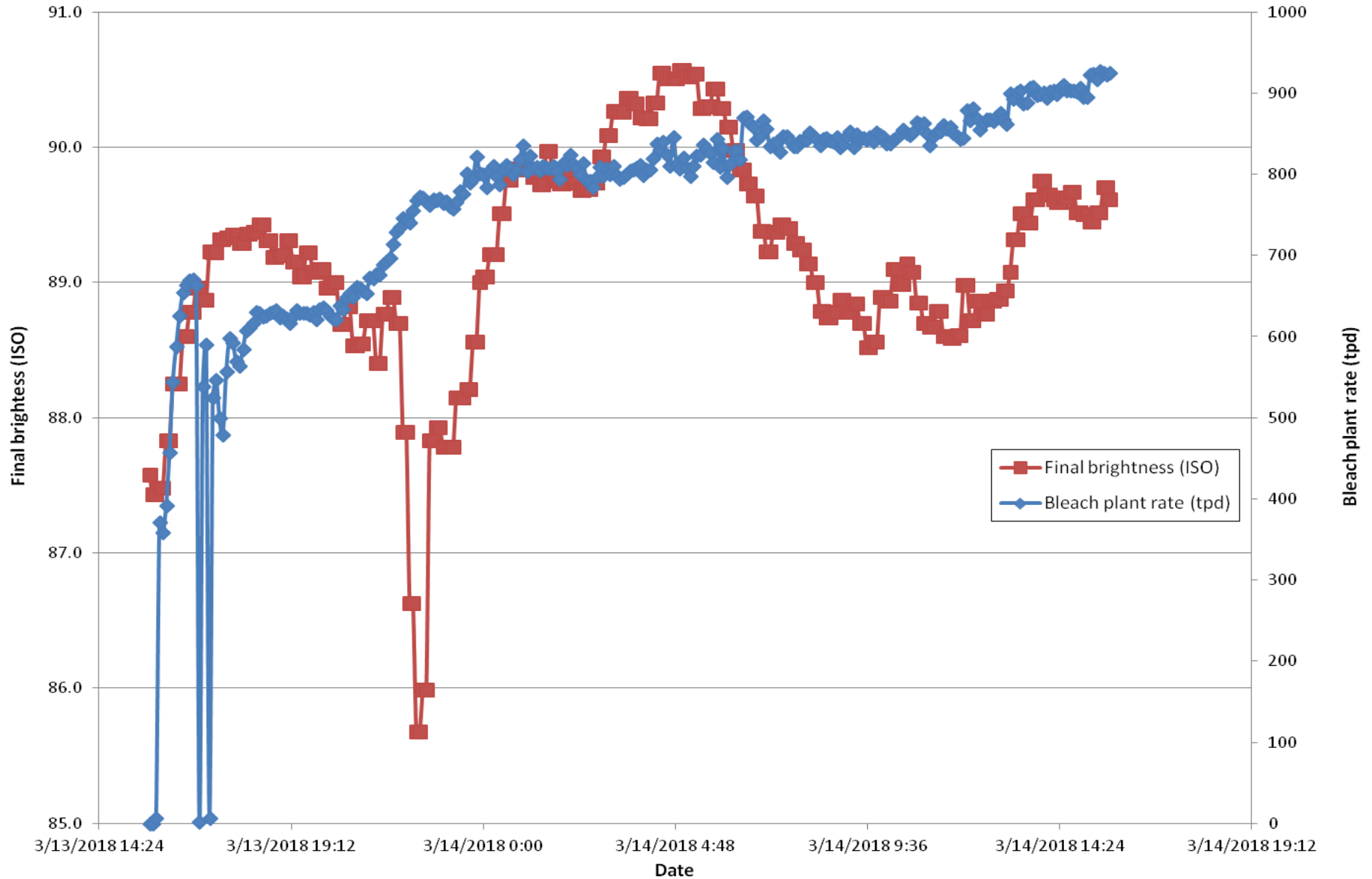


Incoming Kappa vs. Eop Exit Kappa (Before)

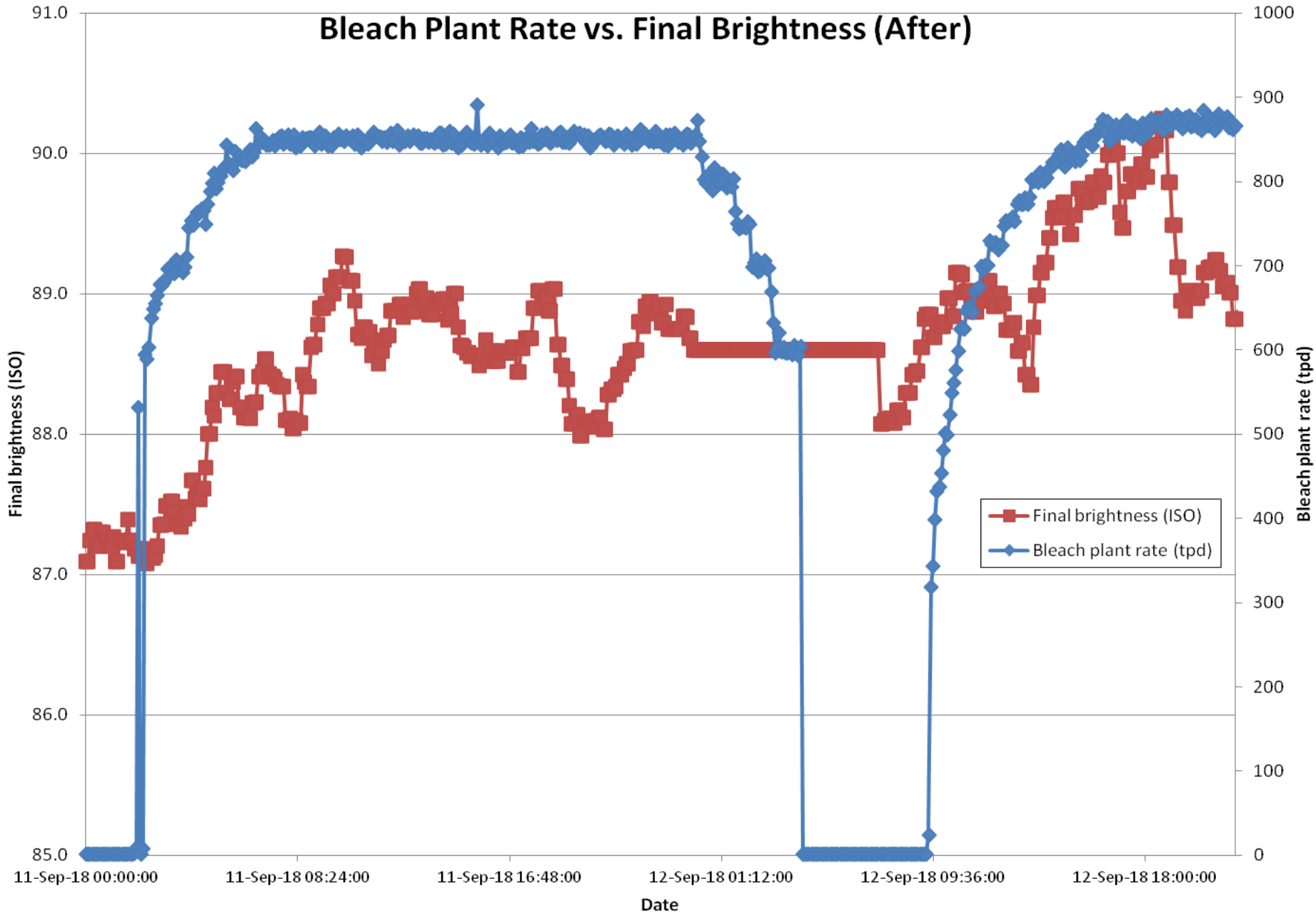




Bleach Plant Rate vs. Final Brightness (Before)



Bleach Plant Rate vs. Final Brightness (After)



Results And Conclusions

- The tower levels of D1EpD2 have been stabilized significantly. This results into an more efficient bleaching at the stages in terms of retention time and chemical residuals.
- The brightness variation of final pulp is reduced, which means less over bleached pulp and off grade pulp due to the low brightness.
- The pH control loop of Eop is still being worked on, and a potential caustic saving at the stage can be achieved.

Thanks!
Questions?