Design study of proposed second Atmospheric distillation unit of ERL using Aspen Plus

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Abstract

Currently, Eastern Refinery Limited (ERL) is the only refinery in Bangladesh which meets about the half of the country’s petroleum product demand (Hasan et al. 2014). Atmospheric Distillation Unit (ADU) and Catalytic Reforming Unit (CRU) are the major units of ERL and efficient operation of these units influence the profitability of the refinery. ADU of ERL currently process 1.5 million MT/yr of crude oil and produces major petroleum products such as naphtha, fuel oil, bitumen, LPG and HSD (ERL, 2014). Currently ERL is proposing to have a second refinery unit with the capability of processing 3 million MT/yr of crude oil (ERL 2015).

Process simulator such as Aspen plus, Aspen HYSYS played an important role to increase the production and effectiveness of petroleum fraction (Li, Hui et al. 2005). In this work, we extend our earlier model (Hassan et al., 2014) and with the addition of CRU unit the ADU unit is scaled up to process 3 million MT/yr of crude oil for the proposed second refinery unit. All the design data has been obtained from existing ERL ADU unit. In this work optimum feed location and number of trays and other configurations of ADU are studied for producing highest amount of kerosene and diesel. Yield of these using different grade crudes used ERL are also evaluated and compared.