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ETP - A future power-house hub of refinery

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The Paper describes about converting ETP into a Future Power-House Hub of Refinery by generating Electricity from a combination of both Normal Steam Rankine Cycle and Organic Rankine Cycle in ETP.The Normal Steam Rankine Cycle will use High or Medium Pressure superheated steam produced by using all possible solid, liquid and gaseous fuels available in our Refinery, and from our nearby areas of NRL. These fuels are burnt in two different furnaces. The by-product from our future bio-refinery will also be used as a fuel. The combustion air required will be supplied from the ETP VOC blower itself, which is now vented (so loss converted into useful purposes) and some amount from Atmospheric air. The Flue gas produced on burning these various fuels will generate Super Heated High Pressure Steam (40 ksc/450 deg C) or Medium pressure steam (14.5 ksc/ 250 deg C) or MP of about 20.0 ksc/440+ deg C (more suitably MP of 20.0 ksc one). This steam will then drive the Condensing Steam Turbine Generator (or Back Pressure Turbine) and produce Electrical Power. The outlet steam is then condensed and sent back to the boiler. The cycle is repeated.

Organic Rankine Cycle: Here the organic compound with high molecular mass and lower boiling point than water will be used to recover heat from the lower temperature sources, like- flue gas heat coming out from the boiler at stack inlet. The working fluid is vaporized and then expanded in a vapor turbine that drives a generator, producing electricity. Here the working fluid may be silicon oil, isopentane, propane, etc. The Volatile Organic Compound (VOC) of ETP may also be used as a source of this fluid after further feasibility study of the composition and properties of the compound. We may recover VOC from different units of our Refinery which will act as a source of working fluid for this cycle. Also these VOCs can be used as a source of gaseous fuel in Furnace F2 and in different furnaces of Refinery.

Biography

Sirajul Mannan Rajbi is the working as officer in power and utility department at Numaligarh Refinery Limited in Assam.

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