1. AIR COOLED CONDENSER

Operating Principle

The ACC unit is designed in multiple of modules. Each module consists of a number of finned tube bundles. The bundles are arranged in A-Frame shape. Each module is served by one axial flow fan driven by an electrical motor via a gearbox. The mechanical equipment is located underneath the tube bundles, delivering cooling air in forced draft mode.

The steam from the turbine exhaust flows through the duct, riser/s to the manifold at top of the tube bundles.

The steam enters the primary modules first. The uncondensed steam enters the secondary modules from the bottom header, operating in reflex mode.

In general, the primary modules / secondary modules surface ratio is 83:17. However, this ratio is subject to change depending upon ambient conditions.

The non-condensable are removed at the top of the secondary modules.

The condensate is drained from the bottom headers through condensate drain lines to the condensate storage Receiver (CST).

The condensate is pumped back to the deaerator by condensate extraction pumps.

COMPONENTS

Tube Bundles

The tube bundle material is aluminum clad carbon steel and fins are aluminum. The tubes are welded to the tube sheets. The tube bundle assembly is hydro tested at shop and shipped fully assembled, ready to be lifted onto the support structure. The ACC shall be a 10(2 streets with 5 Modules) module design.

Supporting Structures

The ACC supporting structure shall be RCC construction. The RCC supporting structure including Fan Deck & deck slab, supporting columns, beams, condensate tank supporting structure with platform, ejector-supporting structure with platform, stair case & walk way and any type of civil work shall be provided. Above Fan Deck, All supports shall be of Structural Steel.

Ducting

The duct is fabricated of IS 2062 Gr. B or equivalent material, primer painted only. The duct will be an all welded construction. The duct includes straight duct to the air cooled condenser, riser to the top of the air cooled condenser, manifold at the top of the tube bundles. The steam duct will be provided with a drain pot to collect water condensing in the duct. Drain pot pumps are provided to pump the water to the condensate tank.
Expansion Bellows

One pressure balance joint on steam duct, one universal joint on each riser and one hinged expansion joint on each manifold are provided.

Piping

Piping will be of carbon steel material. Piping will be at random lengths. Piping includes balance line from steam duct to condensate tank, condensate drain line from air cooled condenser to condensate tank, air take off lines from air cooled condenser to air removal equipment and piping around the drain pot and condensate piping up to inlet of deaerator.

Note: It is assumed that the condensate tank and air removal equipment will be located underneath or adjacent to the air-cooled condenser. Else all piping scope of supply will be subject to mutual agreement.

Condensate Tank

The condensate tank is fabricated of IS 2062 Gr. B material or equivalent. The tank will be sized for Six (6) minute storage time.

Mechanical Equipment

Axial flow fans including fan bells, electric motors (Single Speed), gearboxes and mechanical vibration switches are supplied in accordance with Manufacturers’ standards.

Air Removal Equipment

Steam jet air ejectors as air removal equipment is supplied in accordance with the manufacturer’s standards.

Safety Relief Equipment

Required rupture disc assembly will be provided.

Condensate Extraction Pump

The Condensate Extraction Pumps will be centrifugal horizontal pumps. 2 X 100%. (1W + 1S) are supplied with a capacity of 180 m3/hr. & head 155 mWC.

Drain Boot Pump

The drain Boot Pumps will be centrifugal horizontal pumps. 2 X 100%. (1W + 1S) are supplied with a capacity of 22 m3/hr. & head 20 mWC.

Semi-Automatic Cleaning System
Semi-Automatic Fin cleaning system shall be provided with ladder, hose pipe with spray nozzle, storage tank capacity of 1 m³. The water shall be provided at one point near the ACC column. We shall provide lightning protection of the ACC with necessary horizontal roof conductors and over ground earthing.