

Dear Sir,

With respect to your recent request for information on SMART plant cooling provisions in your letter dated 16/Dec/2015, the followings are estimated water volumes for SMART plant cooling.

- (1) On-shore SMART Plant (with seawater cooling)

Required circulation water volume is ~14,500 ton/hr

- (2) In-land SMART Plant (with Indirect dry cooling with spray, or Indirect Parallel Air Cooling with spray cooling unit)

It is expected about ~13% output power reduction (~13-15MWe) if the condenser is cooled by indirect-dry-cooling option only. However, recently developed advanced condenser cooling technology (spray cooling, PACC) for fossil plants makes it possible to recover a sizable fraction of output power loss by dry cooling only.

As for the indirect dry cooling with spray, make-up water (evaporated water by spray cooling) volume depends on site condition (ambient temperature, humidity and volume of recirculating water), however our initial estimations for SMART are as follows;

→ Sprayed water volume: ~150 ton/hr for 10MWe recovery

(10~40 ton/hr of evaporated water volume depending upon unit efficiency, ambient temperature, humidity, and so on)

Assuming additional spray cooling unit is operated 10 hours a day during high ambient temperature period to recover 5 MWe out of 13 MWe loss by dry cooling only;

→ $150 \text{ ton/hr} \times 10 \text{ hours/day} \times 5 / 10 = 750 \text{ ton/day}$

→ Amount of water volume for daily make-up for spray cooling (due to evaporation)
= $(10\sim40 \text{ ton/hr}) \times 10 \text{ hours/day} \times 5 / 10 = (50\sim200) \text{ ton/day}$

With best wishes,

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