

# **NTPCemphasizes deep analytical/experimental investigations for establishingreliable AUSC Steam Generator fleet**

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NTPC Limited is a part of the Indian consortium entrusted with the development of advanced USC (AUSC) technology by the Government of India. It is evident to the company that establishment of AUSC technology as a fleet having multiple power units requires deep analytical/experimental investigation focus. This conviction emanates from its extensive experience of customizing many equipment designs particularly the steam generator & auxiliaries to the Indian operating conditions. Such experience is reinforced by its experience with advanced carbon conversion technology development and exposure to sourcing of steam generators from almost all major global OEM's.

The steam generator represents a key challenge on the Indian AUSC development roadmap, both in terms of materials as well as product design. These are seen at three levels: Most basic of the challenges is the limited availability of steam generator design features with which Indian industry has become familiar in the last 3-4 decades e.g. tangential firing, 2-pass gas configuration etc. Next level of the challenge is represented by the impact of Indian coals on the steam generator design. The Indian coal characterize uniquely in terms of their slow burning profile and high content of erosive ash mandating larger furnace- which directly impacts the evaporator design (high exit superheat). Perched upon these are direct challenges due to high steam parameters as precipitated during the European program e.g. water wall material maturity, shift to heavy use of nickel alloys as in superheater/reheater tubing etc.

The paper presents NTPC's experience withvarious coal power plant related technologies in last four decades to provide adigested view on the traditional challenges and challenges which are inferredfor the Indian AUSC steam generator. The thermo-hydraulic design of the

evaporator and mechanical design of water walls for the steam generator seem to gain centre stage.