

频繁深度调峰对汽轮发电机的影响及防范措施研究 【上架时间：2023-03-30】



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### 详细信息

【标题】 频繁深度调峰对汽轮发电机的影响及防范措施研究

【Title】 Research on the Influence of frequent deep peak-regulation on turbo-generator and its preventive measures

【摘要】 随着新能源发电量的增加，辅助调峰任务的开展，当前燃煤火电机组承担电网调节任务的压力越来越大。首先本文以华能上安电厂三期2\*600MW超临界火电机组为研究对象，分析了当前频繁深度调峰对发电机定子和转子的影响，产生的问题主要有因铜铁膨胀差及温差导致的发电机绕组的松动变形、发电机振动上升、发电机进油，结合机组实际运行情况指出调峰引起的热应力和热变形是易被忽略且需要重点关注的问题。然后，文章结合上安电厂#5机的调峰参数，对频繁深度调峰时发电机定、转子热应力及热膨胀差值进行了计算分析，验证了在发电机技术标准要求内，当前深调方式不会导致绕组产生塑性变形。最后，通过现场试验，分析了改变氢温、氢压对发电机定、转子热应力及热膨胀差的影响，并提出了发电机频繁调峰运行方式下的优化措施及注意事项，为发电机组的灵活性改造提出了有益参考。

【Abstract】 With the increase of new energy generation and the development of auxiliary peak regulation task, the pressure of coal-fired thermal power units to undertake the power grid regulation task is increasing. First of all, this article taking Huaneng Power plant 2 \* 600 mw supercritical thermal power generating unit as the research object, analyzes the current depth of the frequent load of generator stator and rotor, the influence of the main problems are caused by copper iron expansion difference and temperature difference generator winding of loose deformation, rising vibration of the generator, generator oil, It is pointed out that thermal stress and thermal deformation caused by peak load balancing are easy to be ignored and should be paid more attention to. Then, the thermal stress and thermal expansion difference between stator and rotor during frequent deep peak-adjustment are calculated and analyzed in combination with the peak adjustment parameters of No. 5 generator in Shangang Power Plant, and it is verified that the current deep adjustment mode will not cause plastic deformation of windings in accordance with the requirements of generator technical standards. Finally, through field tests, the effects of changing hydrogen temperature and pressure on thermal stress and thermal expansion difference of generator and rotor are analyzed, and the optimization measures and matters for attention under frequent peak regulation operation mode of generator are put forward, which provides useful reference for flexibility transformation of generator set.

【关键词】 深度调峰；运行方式；发电机定子；发电机转子；热应力；热膨胀差值；氢温；氢压

【Keywords】 deep peak regulation; operation mode; generator stator; generator rotor; thermal stress; thermal expansion difference; hydrogen temperature; hydrogen pressure

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