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发电

汽轮机进汽方式对调节级叶顶间隙蒸汽激振力影响的研究

郭瑞 杨建刚

东南大学火电机组振动国家工程研究中心 东南大学火电机组振动国家工程研究中心

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摘要
该文从分析动叶片轮周力角度出发，研究了汽轮机调节级内汽流周向分布不均匀及进汽方式等因素对叶顶间隙汽流激振力的影响，建立了叶顶激振力模型。新模型考虑了汽流激振力静态/动态以及直接/交叉刚度系数的影响。以某型300MW机组为例进行了计算分析。结果表明：进汽方式对汽流激振力影响较大。在一定范围内汽流力随偏心量的改变而线性改变。不同工况下汽流力的大小和方向会发生改变，直接影响轴承载荷。对动态汽流力的研究表明，汽流激振不仅产生交叉刚度项，还会产生直接刚度项，两者都很重要。良好的设计和运行方式能减小汽流激振力，有利于机组的安全运行。

关键词 热能动力工程 进汽方式 稳定性 汽流激振力 汽流刚度系数

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Effects of Admission Mode on Tip Clearance Induced Steam Force in Turbine Control Stage

Abstract
Based on the analysis of blade force, a tip clearance induced steam force model is set up. The effects of admission mode and circumferential uneven steam distribution in turbine control stage on steam-induced force are considered. The steam forces in the control stage of a 300MW turbine in different admission modes are calculated. Results show that admission mode has great influence on steam exciting force. The static steam force changes linearly with rotor offset in a moderate eccentricity range. The value and direction of the static steam force change a lot in different performance cases, which change bearing load directly. The dynamic steam force can induce both the direct and cross stiffness coefficients. They are all important. Rational design and optimal operation mode can reduce steam force and are favorable for unit operation.

Key words thermal power engineering Admission mode stability analysis Steam excited force Steam stiffness coefficients

DOI:

通讯作者 郭瑞 guorui043@yahoo.com.cn;guorui043@gmail.com

作者个人主页 郭瑞 杨建刚