



调相机次同步振动失稳机理研究及故障治理

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详细信息

【标题】调相机次同步振动失稳机理研究及故障治理

【Title】Study on Instability Mechanism of Sub-synchronous Vibration of Condenser and Troubleshooting

【摘要】次同步动力失稳是旋转机械的一种主要振动故障。一般的经验认为次同步低频振动主要由轴承失稳（油膜涡动、油膜振荡）、汽流激振导致。本文对调相机发生的次同步低频振动故障进行分析，应用Riccati传递矩阵法核算轴系固有频率和稳定性，根据Hertz接触定律数值模拟碰摩调相机转子的动力响应，研究动静碰摩诱发次同步低频振动故障的机理和故障特征，排除了普遍认为的调相机轴承失稳故障，确定动静碰摩是调相机低频振动的主要诱因，指导现场检修消除碰摩故障，调相机运行恢复正常。深化了对调相机次同步低频振动故障的认知，可为机组振动治理提供有益参考。

【Abstract】Sub-synchronous dynamic instability is a major vibration fault of rotating machinery. According to general experience, sub-synchronous low-frequency vibration includes bearing instability (oil film whirl, oil film oscillation) and steam flow induced vibration fault. In this paper, through the analysis of the low-frequency vibration fault of the condenser, the Riccati transfer matrix method is used to calculate the natural frequency and stability of the shafting. According to the Hertz contact law, the dynamic response of the rub impact rotor is numerically simulated, the mechanism and fault characteristics of the sub-synchronous low-frequency vibration fault induced by the dynamic and static rub impact are studied, and the commonly considered bearing instability fault of the condenser is eliminated, It is determined that the dynamic and static rubbing is the main inducement of the low-frequency vibration of the condenser, guide the on-site maintenance, eliminate the rubbing fault, and restore the operation of the condenser to normal. It provides necessary reference for improving the understanding of sub-synchronous low-frequency vibration fault of condenser and safe operation of unit.

【关键词】调相机；低频振动；转子失稳；动静碰摩；

【Keywords】condenser; Low frequency vibration; Rotor instability; Dynamic and static rubbing

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