# Fan blades of thermal power generator

What is a cooling tower fan blade?

The fan is a mechanically forced-draftused to extract the heat accumulated in the flowing cooling water components and the fan blade is a very important part of the towers. Failure of fan blade leads to low productivity,high cost of replacement and maintenance of cooling tower fan blade in service.

Are gas turbine fan blades broken?

Failure report for gas turbine fan blades,1997]. Metallurgical and structural analyses on the failed blades have not shown any microstructure degradation. Studies on the ruptured surfaces using scanning electron microscope (SEM) have shown that fracture has been happenedas a results of high cycle fatigue (hcf).

What kind of blades were found in the turbine casing?

Three kinds of blades were found in the turbine casing after the accident: fractured blades,cracked blades and un-cracked blades. The failure was at the turbine side of the generator and according to the visual inspections,the fan blades at the excitor side were not damaged.

Can a cooling fan blade be fractured?

Since fracture in cooling fan blades has been occurred five timesin our case study,in this research,the emphasis has been placed on failure analysis and preventing methods from the fracture in this generator's fan blades.

What happens if a cooling tower fan blade fails?

cooling structures. The fan is a mechanically forced-draft used to extract the heat important part of the towers. Failure of fan blade leads to low productivity,high cost of replacement and maintenanceof cooling tower fan blade in service. This p aper presents a review on failure mode and material availability of cooling tower fan blade.

How long did a generator rotor fan last?

The failed fan consisting of 11 blades was mounted on the generator-rotor at the turbine end,and had a total service life of about 41000 hoursprior to the failure. The fan rotational speed was 3000 revolutions per minute (rpm) and the maximum operating temperature of the blades was 90°C. Figure 1.

the mounting angle of blades from 19º to 14º to solve the problem of the fans (Iran Power Plant Repair Comany [IPPRC], 2003, 2004). 2. Experimental procedure ... Fracture Analysis of Generator Fan Blades 317 representative fractograph of the fracture surface of blade No. 8 is shown in Fig. 7a. It is

Almost all coal-fired power stations, petroleum, nuclear, geothermal, solar thermal electric, and waste incineration plants, as well as all natural gas power stations are thermal. Natural gas is frequently burned in gas turbines as well as boilers.The waste heat from a gas turbine, in the form of hot exhaust gas, can be used to raise steam by passing this gas through a heat recovery ...

# Fan blades of thermal power generator

Employing a fan as a cooling system for the generator at the end sides of its rotor is a practical method [Montazer Ghaem Gas Turbine Power Plant. Gas turbine generator manual, Iran, 2004]. In some cases, fracture of blades causes short ...

The thermal performance of the bladeless wind power generator will determine the power rating of the machine in the application of wind power generation system. In particular, it is imperative to well understand and control the thermal behavior of the generator in structure without blade of wind energy conversion system. This good understanding needs the ideal ...

Abstract-- Data testifying growth in the number and capacity of power plants that use atmospheric air for heat-removal purposes are presented. The basic schemes for removing heat from turbines involving air-cooled units are considered, and the ratios of their technical indicators, such as heat-transfer surface areas and power consumption for driving ...

Thermal power plants use a significant ... Kushwaha studied failure analysis and technique of averting fracture in the generator"s fan blade. e authors concluded that the blade crack was ...

encountered when dealing with generator rotors, including: Shorted turns Field grounds Thermal sensitivity Negative sequence heating Contamination Misoperation Forging damage The issue of balancing generator rotors after rework or modifications is also discussed. This paper concludes with a discussion on generator

Most nuclear power plants operate a single-shaft turbine generator consisting of one multi-stage HP turbine, three parallel multi-stage LP turbines, the main generator, and an exciter. HP Turbine is usually a double-flow reaction turbine ...

The chord length and installation angle of the blade along the blade height were optimized by using orthogonal optimization. Three design options (straight blades, C-type blades and forward swept blades) are examined in this paper. Taking an axial fan as the research object, the whole 3D numerical simulation was conducted by using Ansys-CFX.

Flexible array eddy current testing of generator fan blades: YANG Hongbin 1, TONG Maofeng 1, WU Xiaolong 1, YU Chao 2, LIU Yang 2, LIU Jianping 2, YIN Jianfeng 2: 1. Beijing Jingqiao ...

A Steam Turbine is a mechanical device that extracts thermal energy from pressurized steam and transforms it into mechanical work. Because the turbine generates rotary motion, it is particularly suited to driving electrical generators - about 90% of all electricity generation in the United States (1996) is by use of steam turbines 1.Sir Charles A. Parsons invented the first modern turbine, a ...

The author studied fatigue failure analysis of the fan blade used in a 500MW unit of a thermal power plant. ... investigated the analytical damage of a generator rotor fan blade by machine-driven ...

Reducing the energy consumption rate of induced draft fan is the main path to reduce the power consumption rate of thermal power units. The induce fan driven by small turbine is greatly effective ...

industries where power is needed for process. In power generation mostly steam turbine is used because of its greater thermal efficiency and higher power-to-weight ratio. Because the turbine generates rotary motion, it is particularly suited to be used ...

TYPICAL LIST OF CRITICAL SPARE PARTS FOR THERMAL POWER STATION CONTENT S.No Description Page No. 1 Boiler 1 2 Turbine 6 ... W Generator seal rings 9 X ACW system 9 2.2 Spare for Diaphragm Type Turbine 9 ... xx ID fan blade assy / impeller with shaft 1 set May be pooled xxi ID fan coupling between fan and

P. Ataei: Fracture and fatigue life evaluation of rotor generator fan blades of a power plant, MSc thesis, Department of Metallurgy and Materials Engineering, South Tehran Azad university, Iran ...

The major equipments of thermal power plant have considered for this study viz. Turbine, Generator, Induced Draft fan, Forced Draft Fan, Primary Air fan, Boiler feed pump, Cooling water pump ...

A thermal power plant uses thermal energy from fuel to produce electric power. Normally coal is used as the source of thermal energy ... expansion happens in the turbine as dry saturated steam enters & hits the blades. This process ...

Through accurate fault diagnosis and handling for once low-pressure rotor blade failure of Unit 3 in the Xiangfan Power Plant and three times low-pressure rotor blade failures of Unit 2 in the ...

Typically, most nuclear power plants operate multi-stage condensing steam turbines modern nuclear power plants, the overall thermal efficiency is about one-third (33%), so 3000 MWth of thermal power from the fission reaction is needed to generate 1000 MWe of electrical power.. Supercritical fossil fuel power plants operated at supercritical pressure (i.e., greater than 22.1 ...

DOI: 10.1520/STP24258S Corpus ID: 137319525; Prediction of Thermal-Mechanical Fatigue Life for Gas Turbine Blades in Electric Power Generation @inproceedings{Bernstein1993PredictionOT, title={Prediction of Thermal-Mechanical Fatigue Life for Gas Turbine Blades in Electric Power Generation}, author={Henry L. Bernstein and T. ...

The Forced Draft Fan (FDF) blade in a 300 MW coal fired power plant that experienced catastrophic failure has been investigated. There were two main locations of the blade damage, namely damage at ...

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9000 ratings!

Principle of Operation of Turbine Generator - Electricity Generation. Most nuclear power plants operate a single-shaft turbine-generator that consists of one multi-stage HP turbine and three parallel multi-stage LP turbines, the main generator and an exciter. HP Turbine is usually a double-flow impulse turbine (or reaction type) with about 10 stages with shrouded blades and ...

The results indicate that: the maximum blade torque increases with the blade ellipticity while the minimum blade torque changes on the contrary; the turbine with a blade ellipticity of 0.72 ...

(A typical power plant steam turbine rotates at 1800-3600 rpm--about 100-200 times faster than the blades spin on a typical wind turbine, which needs to use a gearbox to drive a generator quickly enough to make electricity.) Just like in a steam engine, the steam expands and cools as it flows past a steam turbine"s blades, giving up as much as possible of the ...

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