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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 30831.1-2014

**Condition monitoring and diagnostics of machines --
Thermography -- Part 1: General procedures**

机器状态监测与诊断 热成像 第1部分：总则

(English Translation)

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Foreword

GB/T 30831 "machine condition monitoring and diagnostic thermal imaging" consists of the following components.

--- Part 1. General;

--- Part 2. Analyzing image and diagnostics.

This part of GB/T 30831 Part 1.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses the translation method identical with ISO 18434-1:2008 "machine condition monitoring and diagnostic thermal imaging - Part 1. General" (In English).

Consistency correspondence between this part of international documents and normative references of our files are as follows.

--- GB/T 20921-2007 machine condition monitoring and diagnostics Vocabulary (ISO 13372:2004, IDT);

--- GB/T 22393-2008 machine condition monitoring and diagnostics of general guidelines (ISO 17359:2003, IDT);

--- GB/T 22394-2008 machine condition monitoring and diagnostic data interpretation and diagnostics techniques General guidelines (ISO 13379.

2003, IDT);

--- GB/T 23713.1-2009 machine condition monitoring and predictive diagnostics - Part 1. General guidelines (ISO 13381-1.

2004, IDT).

This section makes the following editorial changes.

--- In the "References" added "GB/T 19870-2005 industrial detect infrared camera." this part of the National mechanical vibration, shock and condition monitoring Standardization Technical Committee (SAC/TC53) and focal points.

This section is drafted. Guangzhou SATIR Co., Ltd., Hubei Electric Power Company State Grid Electric Power Research Institute, China Measurement Technology Surgery Research Institute, Beijing Institute of Technology.

Introduction

This section gives the machine condition monitoring and diagnostics in infrared thermography (IRT) Application Guide section. In the state of the machine when monitoring infrared thermal imaging can be used to identify anomalies and recording machine status. Because the machine is running, poor lubrication, misalignment, parts Wear or abnormal load will lead to abnormalities.

Infrared thermal imaging based on measurements of a target surface radiation heat distribution, and translate them into the radiation intensity difference plot (surface temperature map) or thermal spectra. Thus, before making an infrared thermal imaging measurement engineer, it requires an understanding of the heat, and the temperature of the different types of heat transfer basics.

All machines are running to generate heat, in the current process itself or may be a variety

of process combinations to friction or energy loss forms, it is an inherent characteristic of a process in the medium. Thus, the temperature into machine performance monitoring, condition monitoring key parameters and fault diagnosis. Infrared Thermal imaging technology is ideal for temperature monitoring, because the infrared thermal imaging provides complete thermal images of a machine or parts, having a non-physical connection Touch (non-invasive), set up a simple and fast measurement results and so on.

Compared with contact thermometer, an important advantage of the radiation thermometer is fast response, energy measured object to the speed of light to transmit sensor. The response speed of the radiation thermometer milliseconds or even microseconds. Another advantage of the radiation thermometer is its high sensitivity, because They can detect very small temperature difference between the target and in the form of heat "map" of the show.

Although infrared thermal imaging has proved very useful, but there are still some limitations in measuring Most low emissivity surface, because radiation measurement Signals are susceptible to generate unacceptable errors.

Machine condition monitoring and diagnostic thermal imaging Part 1. General

1 Scope

This section GB/T 30831, introduced a machine condition monitoring and diagnostics of infrared thermal imaging applications. Here the "Machine" includes Machine Auxiliary mechanical equipment, such as valves, fluid mechanical or electrical equipment, and associated heat exchangers. This section also describes the performance evaluation and the machine has Off infrared applications.

This section includes.

- With machine condition monitoring and diagnostics related to infrared thermal imaging terminology;
- Infrared thermal imaging process types and their advantages;
- Use thermal imaging to identify anomalies and to establish guidelines for severity assessment criteria;
- Machine infrared thermal imaging measurement methods and requirements, including safety recommendations;
- Data interpretation, evaluation criteria and reporting requirements of the information;
- Confirmation and compensation reflected apparent temperature, emissivity and attenuating media.

This section also includes the use of quantitative infrared thermal imagers measure the surface temperature of a target, the recognition and compensation reflected apparent

temperature, emissivity Rate and attenuation medium inspection procedures.

Note: The analysis will also develop guidelines for specific applications.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 13372 machine condition monitoring and diagnostics vocabulary
(Condition monitoring and diagnostics of machines-Vocabulary) ISO 13379 machine condition monitoring and diagnostic data interpretation and diagnostic techniques of general guidelines (Condition monitoring and diagnostics of machines-General guidelines on data interpretation and diagnostic techniques) ISO 13381-1 Machine condition monitoring and predictive diagnostics - Part 1. General guidelines (Condition monitoring and diagnostics of machines-Prognostics-Part 1. General guidelines) ISO 17359 machine condition monitoring and diagnostics of general guidelines (Condition monitoring and diagnostics of machines-General guidelines) ISO 18436-7 machine condition monitoring and diagnostics of personnel certification and assessment of personnel - Part 7. Thermal Imaging (Condition monitoring and diagnostics of machines-Requirements for qualification and assessment of personnel-Part 7. Thermography) ASTM E1897 Infrared Imaging Radiometer Standard Test Method for Measuring and Compensating attenuation medium transmission rate (Standard test methods for measuring and compensating for transmittance of an attenuating medium using infrared imaging radiometers)

3 Terms and Definitions

ISO 13372 define the following terms and definitions apply to this document.