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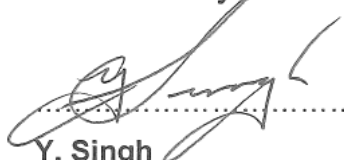


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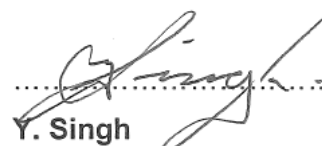


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1. INTRODUCTION

Correct fan vibration protection is essential for safe guarding the Draught Group Fans against major damage or catastrophic failure. In conjunction with that the correct levels to balance the Draught Group fans to are also crucial to ensure long term life, reliability and availability of the plant. This standard strives to set the correct levels for Draught Group fan alarm and trip levels and the correct associated levels to balance the Draught Group fans to.

2. SUPPORTING CLAUSES

2.1 SCOPE

2.1.1 Purpose

The purpose of this document is to set the standard for the correct alarm and trip levels for the different Draught Group Fans and Mill Seal Air Fans and the correct balancing grade to balance the different Draught Group Fans and Mill Seal Air Fans to.

2.1.2 Applicability

The requirements are applicable to all Draught Group Fans and Mill Seal Air Fans on all Eskom Coal Fired Power Stations

2.2 NORMATIVE/INFORMATIVE REFERENCES

2.2.1 Normative

- [1] BS ISO 10816-1:2009 Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 1: General guidelines
- [2] BS ISO 10816-3:2009 Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts -- Part 3: Industrial machines with nominal power above 15 kW and nominal speeds between 120 r/min and 15 000 r/min when measured in situ
- [3] ISO 1940-1 – 2003 Mechanical vibration -- Balance quality requirements for rotors in a constant (rigid) state -- Part 1: Specification and verification of balance tolerances
- [4] 36-1095 Vibration-Based Condition Monitoring Of Rotating Plant Auxiliary Equipment
- [5] 240-75850289 - Manual for Handheld Condition Monitoring

2.2.2 Informative

- [6] Standard for Draught Plant Minimum Protections 240-89217730
- [7] ISO 496:1973 Driving and driven machines. Shaft heights
- [8] BS ISO 2954:2012 Mechanical vibration of rotating and reciprocating machinery. Requirements for instruments for measuring vibration severity
- [9] BS ISO 7919-1:1996 Mechanical vibration of non-reciprocating machines. Measurements on rotating shafts and evaluation criteria. General guidelines
- [10] BS ISO 7919-3:2009 Mechanical vibration. Evaluation of machine vibration by measurements on rotating shafts. Coupled industrial machines
- [11] Air Heater Fire Protection and Detection And Fan Vibration Protection Minimum Requirements Position Paper 474-11040

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2.3 DEFINITIONS

Definition	Description
Draught Group Fans	ID Fan, FD Fan and PA Fan

2.3.1 Disclosure Classification

Controlled Disclosure: Controlled Disclosure to external parties (either enforced by law, or discretionary).

2.4 ABBREVIATIONS

Abbreviation	Description
ID Fan	Induced Draught Fan
FD Fan	Forced Draught Fan
PA Fan	Primary Air Fan
RMS	Root Mean Square
PS	Power Station

2.5 ROLES AND RESPONSIBILITIES

Each PS is responsible to implement the requirements described in this Standard.

2.6 PROCESS FOR MONITORING

Compliance monitoring to this Standard will be via peer reviews and compliance audits

2.7 RELATED/SUPPORTING DOCUMENTS

N/A

3. REQUIREMENTS

3.1 ONLINE VIBRATION MONITORING

3.1.1 Measurement

All online vibration measurement levels will be in RMS velocity (mm/s) values.

3.1.2 Machine Classification

In accordance with BS ISO 10816:2009 using the classification according to machine type the Draught Group Fans are classified under the Group 1 machine types.

In accordance with BS ISO 10816:2009 using the classification according to machine type the Mill Seal Air Fans are classified under the Group 1 machine types.

3.1.3 Support Class

In accordance with BS ISO 10816:2009 the support class based on the design of the Draught Group Fans can be classified as Rigid.

In accordance with BS ISO 10816:2009 the support class based on the design of the Mill Seal Air Fans can be classified as Rigid.

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3.1.4 Alarm Levels

Alarm levels for the Draught Group Fans are to be set for a Group 1 machine with a Rigid support class at the B/C Zone boundary levels which is in accordance with Table A.1 - 4.5 mm/s RMS.

Alarm levels for the Mill Seal Air Fans are as per a Group 1 machine with a Rigid support class at the B/C Zone boundary levels which is in accordance with Table A.2 - 2.8 mm/s RMS. However based on the position of the Seal Air Fans within the Power Stations and the subsequent background noise this level must be set at 4.5mm/s RMS.

3.1.5 Trip Levels

Trip levels for the Draught Group Fans are to be set for a Group 1 machine with a Rigid support class at the C/D Zone boundary levels which is in accordance with Table A.1 - 7.1 mm/s RMS.

Trip levels for the Mill Seal Air Fans are as per a Group 1 machine with a Rigid support class at the C/D Zone boundary levels which is in accordance with Table A.2 - 4.5 mm/s RMS. However based on the position of the Seal Air Fans within the Power Stations and the subsequent background noise this level must be set at 7.0mm/s RMS.

3.2 FAN BALANCING

3.2.1 Classification

In terms of Table 1 in ISO 1940-1 2003 the Draught Group Fans are classified under grade G6.3.

However based on years of operation the requirement for the Draught Group Fans is to be lower in order to secure long term reliability and operation.

The acceptable balancing grade for Draught Group Fans is therefore G2.5

In terms of Table 1 in ISO 1940-1 2003 the Mill Seal Air Fans acceptable balancing grade is G2.5.

4. AUTHORISATION

This document has been seen and accepted by:

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5. REVISIONS

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August 2016	0.0	NA Rust	Final First Draft after informal Review
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April 2017	0.2	NA Rust	Final Draft After Comments Review Process
April 2017	1	NA Rust	Final Document for Authorisation and Publication

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6. DEVELOPMENT TEAM

The following people were involved in the development of this document:

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7. ACKNOWLEDGEMENTS

- None

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