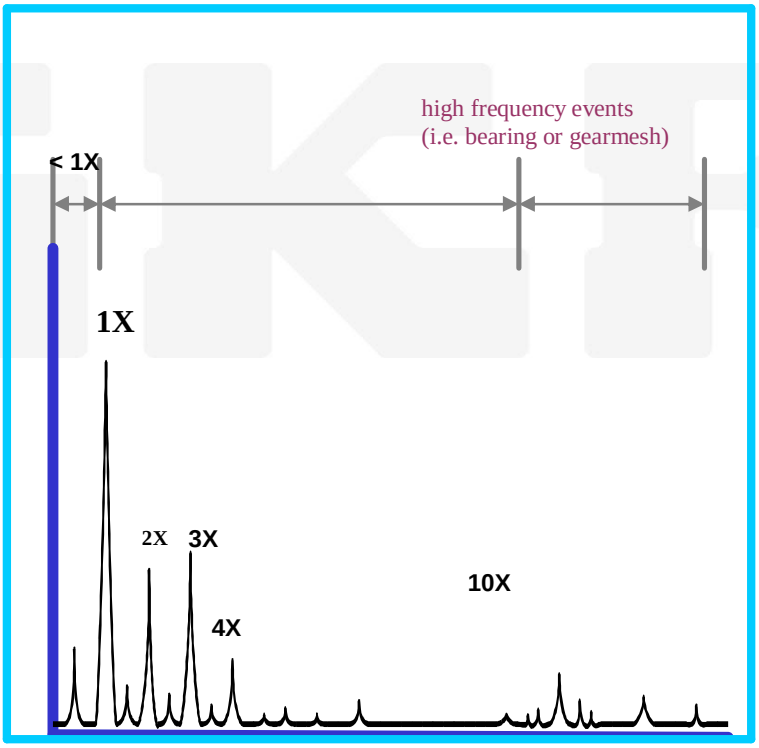
PREDICTIVE MAINTENANCE REPORT

Customer Name :

Site :

Date of Visit : 23rd January 2017

Report No. : PDM/ARC/VA/013/17



SKF CONTACT:	CUSTOMER CONTACT:
SKF Reliability Systems SKF India Limited 1st Floor, SKCL Design Square, S-11 & S-12, Thiru-Vi-Ka Ind. Estate, Guindy – Chennai – 600 032 Tel: 044 66614000 Fax:044 28524452	

II. INRODUCTION

This report is prepared keeping in view the customer's requirement of monitoring the health of any individual equipment at any point of time, as well as the capability to monitor the trend.

This vibration report consists of Vibration values collected at different positions on all the equipments. Demonstrated below is the procedure they have been codified:

Every vibration point consists of 3 characters. **(eg. 1HV OR 3AV etc.)**

1st Character is a number indicating **LOCATION** of the vibration Measurement
2nd Character indicates **ORIENTATION** of the vibration Measurement
3rd Character indicates **TYPE / CHARACTERISTIC** of the vibration Measurement

Location	Orientation	Type
1- Motor Non Drive End	H – Horizontal	V- Velocity
2- Motor Drive End	V – Vertical	A- Acceleration
3- (Fan / Pump) Drive End	A – Axial	D- Displacement
4- (Fan / Pump) NDE	R – Radial	EA- Enveloped Acceleration
5- Output bearing		

Etc.

CATEGORY:

NORMAL – Those machines that are operating within the satisfactory limits of Vibration values as per ISO-10816.

ALERT – Those machines that are operating above the satisfactory limits of Vibration values as per ISO-10816. It is usually recommended to plan the maintenance action at the earliest available opportunity; this would help reducing the after effects of any failure as well as properly plan the activity.

ALARM – Those machines that are operating in most abnormal condition and it is usually recommended to immediately take maintenance action, so as to avoid any catastrophic failure.

Velocity Severity	Velocity Range Limits and Machine Classes ISO Standard 10816-1			
			Large Machines	
mm/s RMS	Small Machine class I	Medium Machine Class II	Rigid Supports Class III	Less Rigid Supports Class III
0.28	Good	Good	Good	Good
0.45				
0.71				
1.12	Satisfactory			
1.80		Satisfactory		
2.80	Unsatisfactory (Alert)		Satisfactory	
4.50		Unsatisfactory (Alert)		Satisfactory
7.10	Unacceptable (Alarm)		Unsatisfactory (Alert)	
11.20		Unacceptable (Alarm)		Unsatisfactory (Alert)
18.00			Unacceptable (Alarm)	
28.00				Unacceptable (alarm)
45.00				

MACHINE CLASSIFICATION IN ACCORDANCE WITH ISO 10816-1

Class 1 :	Individual parts of engines and machines, integrally connected with the complete machine in its normal operating condition. (Production electrical motors of up to 15 Kw are typical examples of machines in this category)

Class 2 :	Medium-sized machines, (Typically Electrical Motors with 15 to 75 Kw output) without special foundations, rigidly mounted engines or machines (up to 300 Kw) on special foundations.

Class 3 :	Large prime movers and other large machines with rotating masses mounted on rigid and heavy foundation which are relatively stiff in the direction of vibration measurement.

Class 4 :	Large prime movers and other large machines with rotating masses mounted on rigid and heavy foundation which are relatively soft in the direction of vibration measurement. (for ex. Turbo generator sets, especially those with light weight substructures).

Class 5 :	Machines and mechanical drives system with unbalanceable inertia effects (due to reciprocating parts), mounted on foundations which are relatively stiff in the direction of vibration measurement.

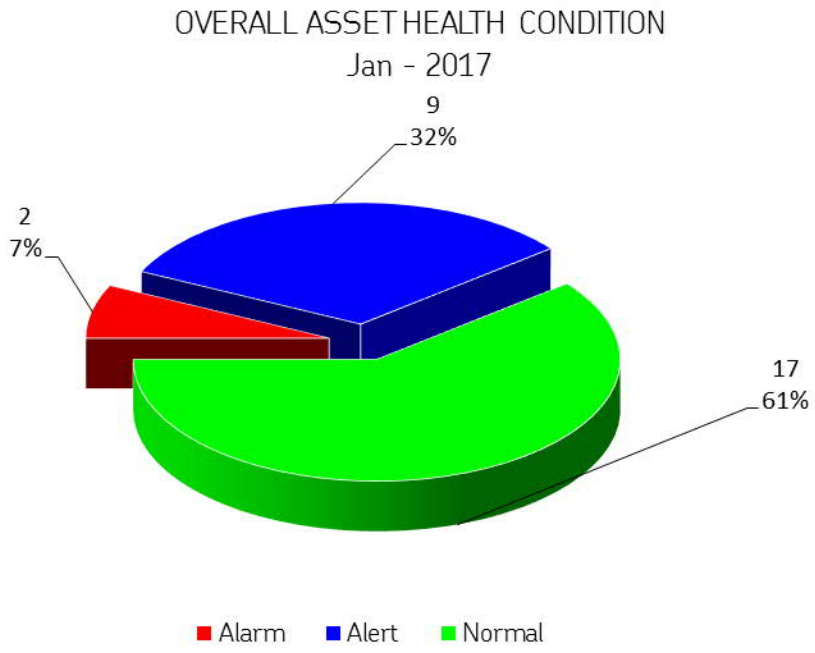
Visited & Analysed by : **Mr. Vaibhav Jain**

Microlog Model : **CMXA 70**

Microlog Sl.No. **1009047**

Calibration Due : **May-2017**

During the visit of our Engineer to your plant on **23.01.2017**, detailed vibration measurement and analysis was carried out on the following machines. The Present health condition of each machines are given below for your ready reference.



S.NO	EQUIPMENT NAME	HEALTH CONDITION	PAGE NO
1	HAMMER MILL DC FAN	NORMAL	06 – 07
2	GENERAL DC FAN	ALERT	08 – 10
3	COATING CIRCUIT BOOSTER FAN	ALERT	11 – 13
4	COATING CIRCUIT MAIN AIR FAN	ALERT	14 – 15
5	SELOX MAIN AIR FAN	NORMAL	16 – 17
6	COATING FUGITIVE FAN	ALERT	18 – 20
7	UN-COATING FUGITIVE FAN	ALARM	21 – 23
8	UNCOATED TRANSFER BLOWER	NORMAL	24 - 25
9	COATED TRANSFER BLOWER	NORMAL	26 - 27

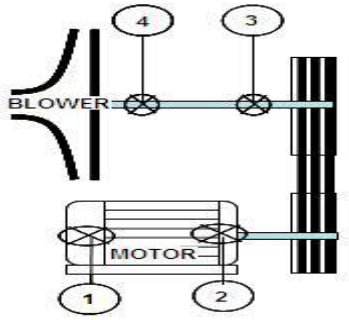
10	BALL MILL	NORMAL	28 – 30
11	HAMMER MILL RIGHT (DRIVE#1)	NORMAL	31 – 33
12	HAMMER MILL LEFT (DRIVE#2)	NORMAL	34 – 35
13	CLASSIFIER	NORMAL	36 – 37
14	DE-AGGLOMERATOR	NORMAL	38 – 39
15	BLENDER – HOUSING SIDE	NORMAL	40 – 41
16	BLENDER – DOOR SIDE	ALERT	42 – 44
17	BLENDER AERATION BLOWER	NORMAL	45 – 46
18	PRODUCT SILO AERATION BLOWER	NORMAL	47 – 48
19	BALL MILL DISCHARGE BUCKET ELEVATOR	ALERT	49 – 51
20	SILO FEED BUCKET ELEVATOR	NORMAL	52 – 54
21	CLASSIFIER AIR SLIDE FAN	ALERT	55 – 56
22	SEAL AIR FAN	ALERT	57 – 58
23	SILO-1 BINVENT FAN	NORMAL	59 – 60
24	SILO-2 BINVENT FAN	ALARM	61 – 62
25	SILO-3 BINVENT FAN	ALERT	63 – 64
26	SILO-4 BINVENT FAN	NORMAL	65 – 66
27	SILO-5 BINVENT FAN	NORMAL	67 – 68
28	SILO-6 BINVENT FAN	NORMAL	69 – 70

Additional to the vibration analysis and diagnostic survey SKF can also help in implementing the following inspections and rectifications.

- *In-Situ Dynamic Balancing*
- *Laser Alignment of rigid rotors – Shaft & Pulley*
- *Root cause Failure analysis (RCFA) of anti friction bearings*
- *Thermography*
- *Acoustic emission*
- *Remote Diagnostics*
- *Mounting & dismounting of anti friction bearings- Only inspection*
- *Motor current signature analysis (MCSA)*
- *Lubrication Management*
- *Oil Analysis*
- *Engineering Simulation Services / Structural analysis*
- *Stock inspection-anti friction bearings*
- *Bearing remanufacturing*
- *Spindle services*
- *Maintenance Strategy review*
- *SRCM*

If there is any specific requirements, kindly feel free to contact us.

Detailed Measurement and Analysis Report is as follows.

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	1	EQUIPMENT NAME	HAMMER MILL DC FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1480 RPM	1313 RPM	At Ground	N
Power Rating	75 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6317 / 6314	22220 EK / 22220 EK	Above Ground Level	Y
			On Vibro Pad	Y
Pulley Dia	315	335	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	4.6	4.1	NORMAL
BLOWER	4.1	3.4	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.1 mm/s recorded in the Motor bearings.

ANALYSIS:

- Vibrations increased slightly with minor symptoms of structural looseness at motor end.

ACTION PLAN:

1. It is suggested to keep close monitoring over system feedback during routine field observations.

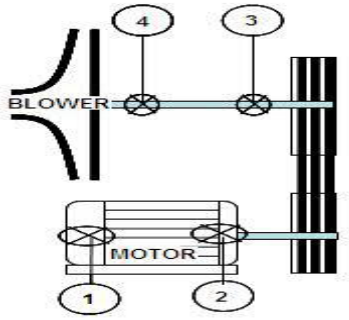
Last Measurement Report

Source: Hammer Mill DC Fan

2/14/2017 3:49:33 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 2:53:22 PM	1.981	mm/s
Motor NDE 1HL	1/23/2017 2:53:26 PM	1.862	mm/s
Motor NDE HA	1/23/2017 2:53:30 PM	0.153	g
Motor NDE 1HgE3	1/23/2017 2:53:33 PM	1.448	gE
Motor NDE 1V	1/23/2017 2:53:44 PM	3.277	mm/s
Motor NDE 1A	1/23/2017 2:53:54 PM	2.083	mm/s
Motor DE 2H	1/23/2017 2:54:04 PM	1.929	mm/s
Motor DE HA	1/23/2017 2:54:07 PM	0.309	g
Motor DE 2HgE3	1/23/2017 2:54:11 PM	1.948	gE
Motor DE 2V	1/23/2017 2:54:21 PM	4.102	mm/s
Motor DE 2A	1/23/2017 2:54:33 PM	1.545	mm/s
Fan DE 3HL-V	1/23/2017 2:54:48 PM	3.323	mm/s
Fan DE 3H	1/23/2017 2:54:52 PM	3.307	mm/s
Fan DE HA	1/23/2017 2:54:55 PM	0.702	g
Fan DE 3HgE3	1/23/2017 2:54:59 PM	7.675	gE
Fan DE 3V	1/23/2017 2:55:11 PM	3.445	mm/s
Fan DE 3A	1/23/2017 2:55:20 PM	2.225	mm/s
Fan NDE 4HL	1/23/2017 2:55:33 PM	2.368	mm/s
Fan NDE 4H	1/23/2017 2:55:37 PM	2.435	mm/s
Fan NDE HA	1/23/2017 2:55:41 PM	0.473	g
Fan NDE 4HgE3	1/23/2017 2:55:44 PM	3.243	gE
Fan NDE 4V	1/23/2017 2:56:04 PM	2.854	mm/s
Fan NDE 4A	1/23/2017 2:56:13 PM	2.364	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	2	EQUIPMENT NAME	GENERAL DC FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1475 RPM	2733 RPM	At Ground	N
Power Rating	45 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6313 / 6313	6312 / 6312	Above Ground Level	Y
			On Vibro Pad	Y
Pulley Dia	315	170	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	5.1	4.3	NORMAL
BLOWER	7.5	9.8	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 9.8 mm/s recorded in the Blower bearings.

ANALYSIS:

- Overall health condition of the equipment is slightly above than the ALERT condition but reduced significantly than the previous vibrations data after fan assembly replacement but slight higher at fan end.

ACTION PLAN:

1. Ok to run under trend monitoring, Improvement in system rigidity may reduce vibrations further.
2. Check fan bearing housing for any looseness & clean coating accumulated on fan impeller on earliest available opportunity.

Last Measurement Report

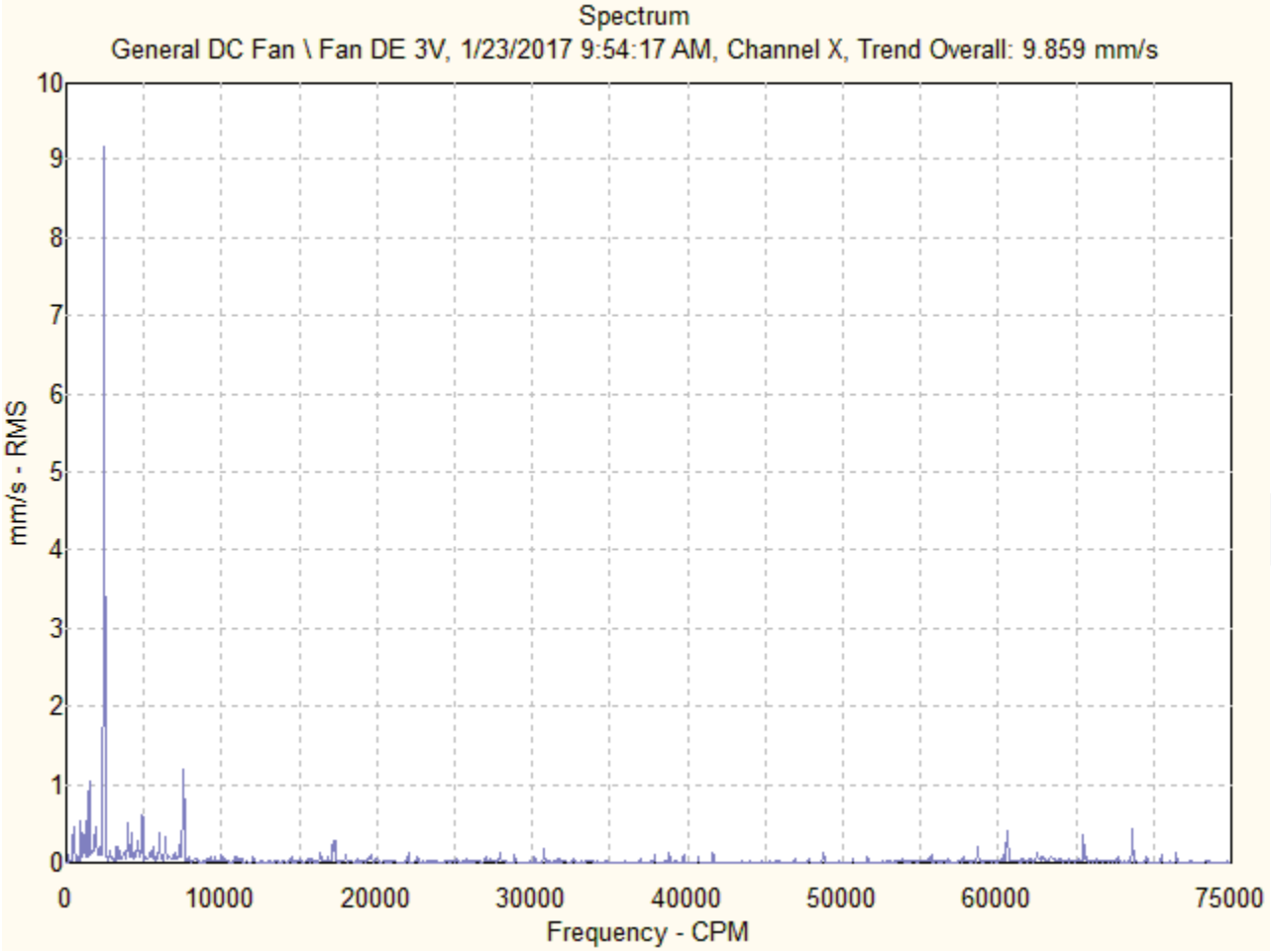
Source: General DC Fan

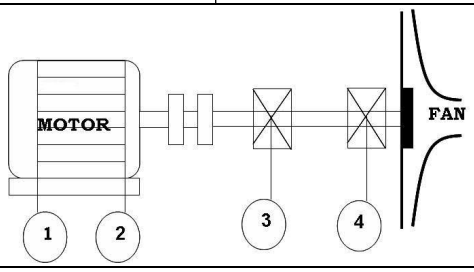
2/14/2017 3:50:23 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 9:51:51 AM	3.573	mm/s
Motor NDE 1HL	1/23/2017 9:51:55 AM	3.797	mm/s
Motor NDE HA	1/23/2017 9:51:58 AM	0.349	g
Motor NDE 1HgE3	1/23/2017 9:52:01 AM	1.965	gE
Motor NDE 1V	1/23/2017 9:52:17 AM	3.455	mm/s
Motor NDE 1A	1/23/2017 9:52:30 AM	3.348	mm/s
Motor DE 2H	1/23/2017 9:52:47 AM	2.644	mm/s
Motor DE HA	1/23/2017 9:52:50 AM	0.277	g
Motor DE 2HgE3	1/23/2017 9:52:53 AM	1.314	gE
Motor DE 2V	1/23/2017 9:53:05 AM	4.370	mm/s
Motor DE 2A	1/23/2017 9:53:17 AM	3.260	mm/s
Fan DE 3H	1/23/2017 9:53:33 AM	4.549	mm/s
Fan DE HA	1/23/2017 9:53:36 AM	1.946	g
Fan DE 3HgE3	1/23/2017 9:53:39 AM	15.613	gE
Fan DE 3V	1/23/2017 9:54:17 AM	9.859	mm/s
Fan DE 3A	1/23/2017 9:54:31 AM	4.628	mm/s
Fan NDE 4HL	1/23/2017 9:54:42 AM	4.995	mm/s
Fan NDE 4H	1/23/2017 9:54:46 AM	5.045	mm/s
Fan NDE HA	1/23/2017 9:54:49 AM	0.913	g
Fan NDE 4HgE3	1/23/2017 9:54:52 AM	13.190	gE
Fan NDE 4V	1/23/2017 9:55:03 AM	8.471	mm/s
Fan NDE 4A	1/23/2017 9:55:21 AM	4.523	mm/s

General DC Fan \ Fan DE 3V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	3	EQUIPMENT NAME	COATING CIRCUIT BOOSTER FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2960 RPM	2960 RPM	At Ground	N
Power Rating	75 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6317 ZZ 6314ZZ	22215 EK 22215 EK	Above Ground Level On Vibro Pad	Y Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.2	3.2	NORMAL
BLOWER	7.2	7.2	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 7.2 mm/s recorded in the Blower bearings.

ANALYSIS:

- Overall health condition of the equipment is in ALERT condition & Vibrations observed with slight increment at fan end due to temporary unbalance in the fan assembly.

ACTION PLAN:

1. It is suggested to check the damper bolts for any looseness.
2. It is suggested to clean coating accumulated on fan impeller as per schedule.

Last Measurement Report

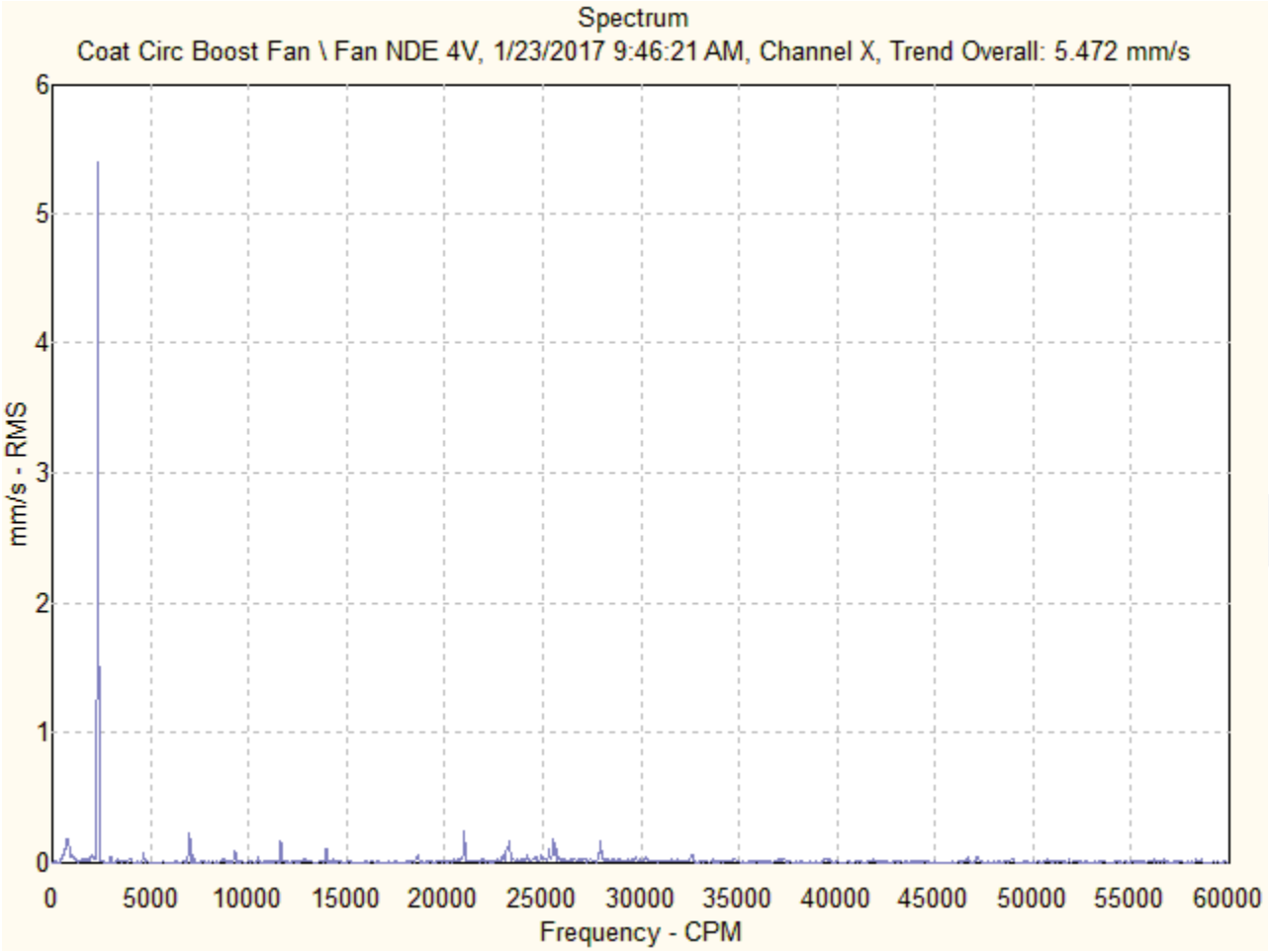
Source: Coat Circ Boost Fan

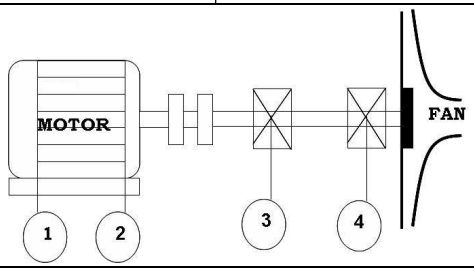
2/14/2017 3:51:00 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 9:43:28 AM	1.524	mm/s
Motor NDE 1HL	1/23/2017 9:43:32 AM	1.329	mm/s
Motor NDE HA	1/23/2017 9:43:35 AM	0.642	g
Motor NDE 1HgE3	1/23/2017 9:43:38 AM	2.852	gE
Motor NDE 1V	1/23/2017 9:43:56 AM	2.153	mm/s
Motor NDE 1A	1/23/2017 9:44:09 AM	1.323	mm/s
Motor DE 2H	1/23/2017 9:44:17 AM	2.658	mm/s
Motor DE HA	1/23/2017 9:44:20 AM	0.348	g
Motor DE 2HgE3	1/23/2017 9:44:23 AM	3.682	gE
Motor DE 2V	1/23/2017 9:44:34 AM	1.886	mm/s
Motor DE 2A	1/23/2017 9:44:45 AM	1.433	mm/s
Fan DE 3HL-V	1/23/2017 9:45:01 AM	1.380	mm/s
Fan DE 3H	1/23/2017 9:45:04 AM	1.446	mm/s
Fan DE HA	1/23/2017 9:45:07 AM	0.541	g
Fan DE 3HgE3	1/23/2017 9:45:10 AM	4.047	gE
Fan DE 3V	1/23/2017 9:45:21 AM	3.857	mm/s
Fan DE 3A	1/23/2017 9:45:36 AM	2.112	mm/s
Fan NDE 4HL	1/23/2017 9:45:46 AM	2.308	mm/s
Fan NDE 4H	1/23/2017 9:45:49 AM	2.309	mm/s
Fan NDE HA	1/23/2017 9:45:52 AM	0.384	g
Fan NDE 4HgE3	1/23/2017 9:45:55 AM	2.643	gE
Fan NDE 4V	1/23/2017 9:46:21 AM	5.472	mm/s
Fan NDE 4A	1/23/2017 9:46:37 AM	1.397	mm/s

Coat Circ Boost Fan \ Fan NDE 4V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	4	EQUIPMENT NAME	COATING CIRCUIT MAIN AIR FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1460 RPM	1460 RPM	At Ground	N
Power Rating	18.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6310 ZZ 6210ZZ	22213 EK 22213 EK	Above Ground Level On Vibro Pad	Y Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	4.7	4.0	NORMAL
BLOWER	5.9	4.5	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.5 mm/s recorded in the Blower bearings.

ANALYSIS:

- Symptoms of structural looseness indicated in FFT spectrum.

ACTION PLAN:

1. It is suggested to check all the motor base bolts, bearing housing foundation bolts & vibro pads for proper function to the system.
2. Replace the faulty vibro pads, if any. Impeller to be cleaned for coating accumulated as per schedule.

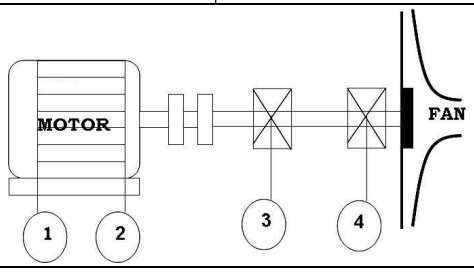
Last Measurement Report

Source: Coat Circ Main Fan

2/14/2017 3:52:00 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:30:09 AM	3.855	mm/s
Motor NDE 1HL	1/23/2017 10:30:13 AM	4.003	mm/s
Motor NDE HA	1/23/2017 10:30:17 AM	0.158	g
Motor NDE 1HgE3	1/23/2017 10:30:20 AM	1.024	gE
Motor NDE 1V	1/23/2017 10:30:31 AM	3.649	mm/s
Motor NDE 1A	1/23/2017 10:30:43 AM	2.650	mm/s
Motor DE 2H	1/23/2017 10:30:52 AM	2.729	mm/s
Motor DE HA	1/23/2017 10:30:55 AM	0.259	g
Motor DE 2HgE3	1/23/2017 10:30:59 AM	1.177	gE
Motor DE 2V	1/23/2017 10:31:10 AM	2.996	mm/s
Motor DE 2A	1/23/2017 10:31:23 AM	2.645	mm/s
Fan DE 3HL-V	1/23/2017 10:31:34 AM	2.339	mm/s
Fan DE 3H	1/23/2017 10:31:37 AM	2.366	mm/s
Fan DE HA	1/23/2017 10:31:40 AM	0.238	g
Fan DE 3HgE3	1/23/2017 10:31:43 AM	2.526	gE
Fan DE 3V	1/23/2017 10:31:54 AM	2.154	mm/s
Fan DE 3A	1/23/2017 10:32:03 AM	1.464	mm/s
Fan NDE 4HL	1/23/2017 10:32:26 AM	4.497	mm/s
Fan NDE 4H	1/23/2017 10:32:29 AM	4.505	mm/s
Fan NDE HA	1/23/2017 10:32:32 AM	0.292	g
Fan NDE 4HgE3	1/23/2017 10:32:36 AM	2.022	gE
Fan NDE 4V	1/23/2017 10:32:47 AM	2.270	mm/s
Fan NDE 4A	1/23/2017 10:33:01 AM	2.893	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	5	EQUIPMENT NAME	SELOX MAIN AIR FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1485 RPM	1485 RPM	At Ground	Y
Power Rating	525 KW	NA	On Rigid Concrete	Y
Bearing No. (DE/NDE)	NU-324 6324/C3	22226 EK 22226 EK	Above Ground Level On Vibro Pad	N N
Pulley Dia	NA	NA	On Steel Structure	N

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	1.5	1.8	NORMAL
BLOWER	2.0	2.0	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 2.0 recorded in the Blower bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards.

ACTION PLAN:

1. Ok to run under trend monitoring.

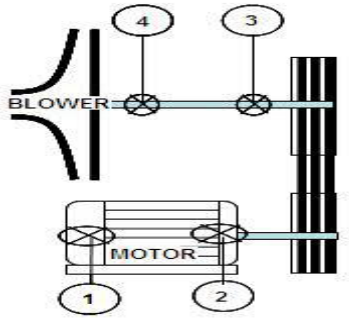
Last Measurement Report

Source: Selox Mainair Fan

2/14/2017 3:52:34 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 11:46:31 AM	1.428	mm/s
Motor NDE HA	1/23/2017 11:46:34 AM	0.668	g
Motor NDE 1HgE3	1/23/2017 11:46:37 AM	2.812	gE
Motor NDE 1V	1/23/2017 11:46:48 AM	1.080	mm/s
Motor NDE 1A	1/23/2017 11:46:57 AM	1.389	mm/s
Motor DE 2H	1/23/2017 11:47:11 AM	1.119	mm/s
Motor DE HA	1/23/2017 11:47:14 AM	0.377	g
Motor DE 2HgE3	1/23/2017 11:47:18 AM	5.789	gE
Motor DE 2V	1/23/2017 11:47:29 AM	1.429	mm/s
Motor DE 2A	1/23/2017 11:47:40 AM	1.454	mm/s
Fan DE 3HL-V	1/23/2017 11:47:57 AM	0.718	mm/s
Fan DE 3H	1/23/2017 11:48:03 AM	0.723	mm/s
Fan DE HA	1/23/2017 11:48:06 AM	0.197	g
Fan DE 3HgE3	1/23/2017 11:48:09 AM	2.843	gE
Fan DE 3V	1/23/2017 11:48:20 AM	0.783	mm/s
Fan DE 3A	1/23/2017 11:48:31 AM	1.067	mm/s
Fan NDE 4HL	1/23/2017 11:48:43 AM	1.005	mm/s
Fan NDE 4H	1/23/2017 11:48:48 AM	1.022	mm/s
Fan NDE HA	1/23/2017 11:48:51 AM	0.274	g
Fan NDE 4HgE3	1/23/2017 11:48:55 AM	9.974	gE
Fan NDE 4V	1/23/2017 11:49:07 AM	1.327	mm/s
Fan NDE 4A	1/23/2017 11:49:21 AM	2.002	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	6	EQUIPMENT NAME	COATING FUGITIVE FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1460 RPM	1460 RPM	At Ground	Y
Power Rating	18.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6310 ZZ 6210 ZZ	22213 EK 22213 EK	Above Ground Level On Vibro Pad	N Y
Pulley Dia	250	250	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	9.5	6.2	NORMAL
BLOWER	11.4	10.1	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 10.1 mm/s recorded in the Blower bearings.

ANALYSIS:

- Symptoms of minor imbalance has also been indicated including inadequate base rigidity.
- Symptoms indicating belt pulley misalignment observed in FFT analysis.

ACTION PLAN:

1. It is suggested to verify belt pulley alignment and assemble the missing belt as shown during measurement. Also review coating cleaning frequency as a preliminary action and arrange to provide proper stiffening to the structure to achieve adequate rigidity at all measurement location, Meanwhile it is also suggested to perform dynamic balancing of fan impeller after improving base structure rigidity.

Last Measurement Report

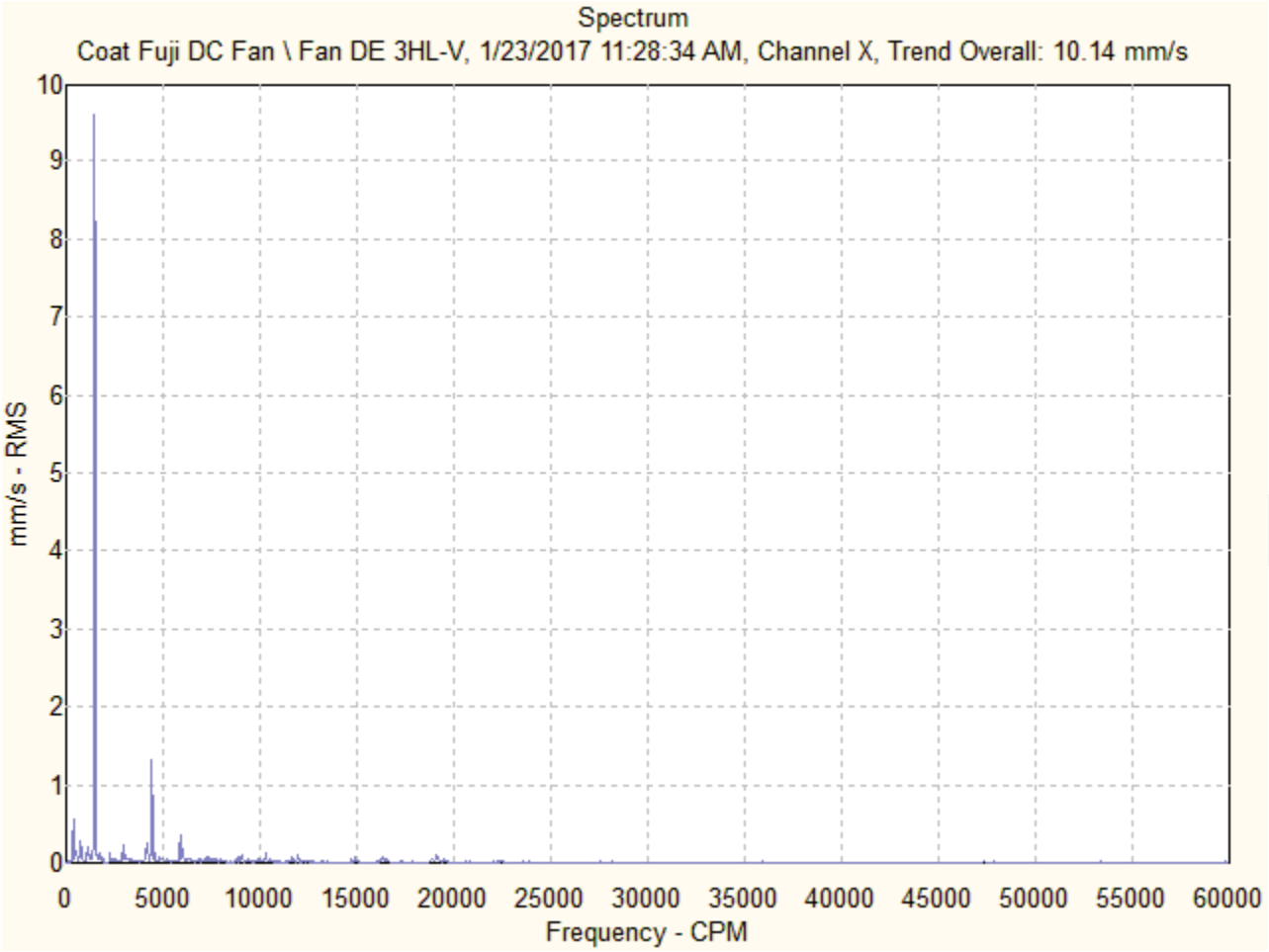
Source: Coat Fuji DC Fan

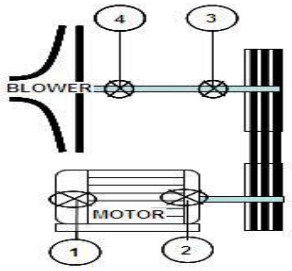
2/14/2017 3:52:55 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 11:25:00 AM	4.329	mm/s
Motor NDE 1HL	1/23/2017 11:25:06 AM	6.236	mm/s
Motor NDE HA	1/23/2017 11:25:10 AM	0.322	g
Motor NDE 1HgE3	1/23/2017 11:25:14 AM	1.150	gE
Motor NDE 1V	1/23/2017 11:27:09 AM	8.502	mm/s
Motor NDE 1A	1/23/2017 11:27:21 AM	3.214	mm/s
Motor DE 2H	1/23/2017 11:27:30 AM	5.579	mm/s
Motor DE HA	1/23/2017 11:27:33 AM	0.306	g
Motor DE 2HgE3	1/23/2017 11:27:36 AM	1.404	gE
Motor DE 2V	1/23/2017 11:27:51 AM	6.938	mm/s
Motor DE 2A	1/23/2017 11:28:14 AM	7.053	mm/s
Fan DE 3HL-V	1/23/2017 11:28:34 AM	10.143	mm/s
Fan DE 3H	1/23/2017 11:28:38 AM	8.123	mm/s
Fan DE HA	1/23/2017 11:28:41 AM	0.219	g
Fan DE 3HgE3	1/23/2017 11:28:44 AM	3.532	gE
Fan DE 3V	1/23/2017 11:28:55 AM	6.001	mm/s
Fan DE 3A	1/23/2017 11:29:05 AM	6.112	mm/s
Fan NDE 4HL	1/23/2017 11:29:16 AM	9.292	mm/s
Fan NDE 4H	1/23/2017 11:29:20 AM	10.027	mm/s
Fan NDE HA	1/23/2017 11:29:23 AM	0.220	g
Fan NDE 4HgE3	1/23/2017 11:29:27 AM	1.785	gE
Fan NDE 4V	1/23/2017 11:29:37 AM	8.357	mm/s
Fan NDE 4A	1/23/2017 11:29:46 AM	5.008	mm/s

Coat Fuji DC Fan \ Fan DE 3HL-V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	7	EQUIPMENT NAME	UN-COATING FUGITIVE FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1460 RPM	1460 RPM	At Ground	Y
Power Rating	18.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6310 ZZ 6210 ZZ	22213 EK 22213 EK	Above Ground Level On Vibro Pad	N Y
Pulley Dia	250	250	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	20.1	12.4	ALERT
BLOWER	22.4	10.1	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 14.5 mm/s recorded in the Blower bearings.

ANALYSIS:

- Vibrations decreased slightly from the past measurement history.
- Symptoms of structural looseness indicated in FFT spectrum and also considerable unbalance in fan rotor coupled with introductory bearing fault indications observed in fan bearings..

ACTION PLAN:

1. Motor base rigidity is to be improved. Check vibration pads condition for proper function and provide additional rigidity to the system. Check the base foundation frame and bolts for adequate rigidity. Fan bearings are to be inspected for any abnormality and to be replaced if needed. Scheduled coating cleaning to be followed.

Last Measurement Report

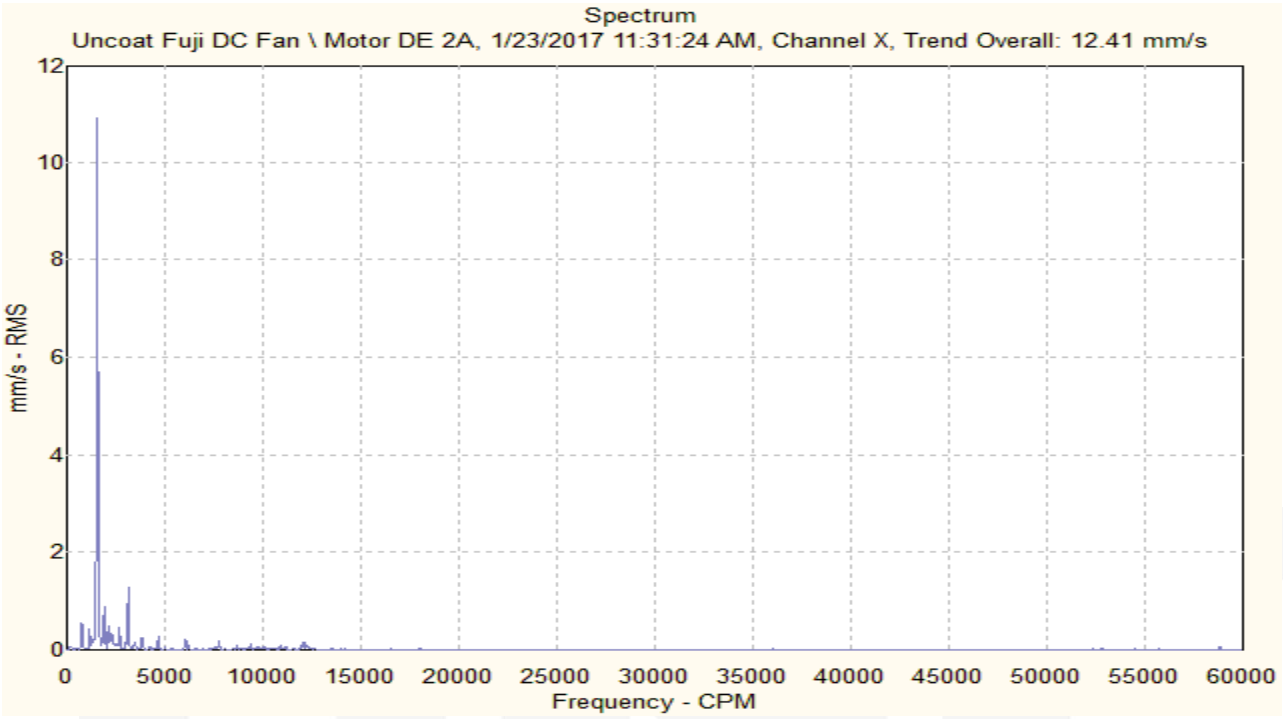
Source: Uncoat Fuji DC Fan

2/14/2017 3:53:52 PM

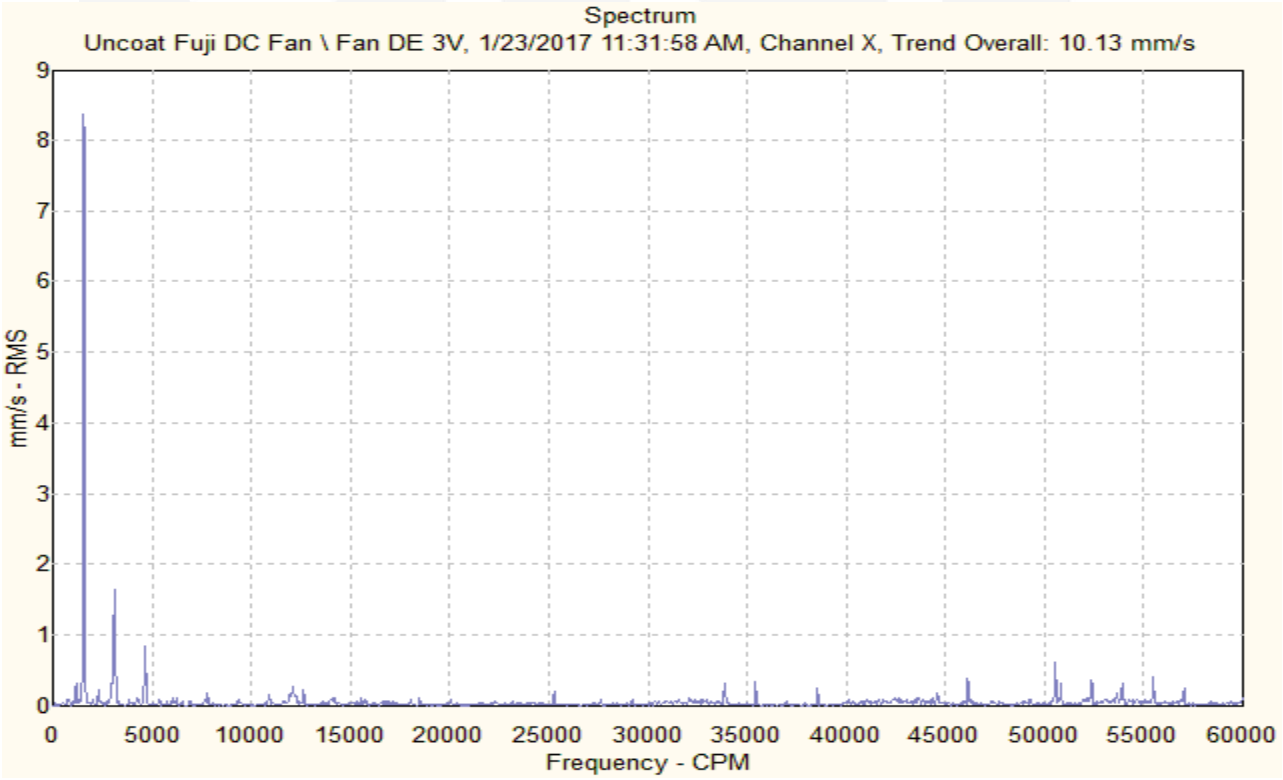
Last Measurement

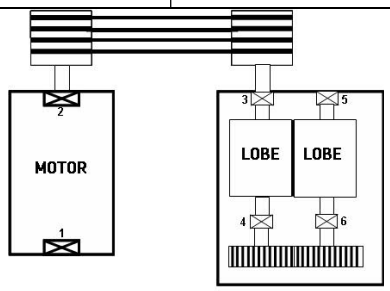
POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 11:30:05 AM	8.738	mm/s
Motor NDE 1HL	1/23/2017 11:30:10 AM	8.954	mm/s
Motor NDE HA	1/23/2017 11:30:13 AM	0.383	g
Motor NDE 1HgE3	1/23/2017 11:30:16 AM	1.893	gE
Motor NDE 1V	1/23/2017 11:30:30 AM	10.724	mm/s
Motor NDE 1A	1/23/2017 11:30:43 AM	9.248	mm/s
Motor DE 2H	1/23/2017 11:30:50 AM	7.604	mm/s
Motor DE HA	1/23/2017 11:30:54 AM	0.281	g
Motor DE 2HgE3	1/23/2017 11:30:57 AM	3.069	gE
Motor DE 2V	1/23/2017 11:31:10 AM	7.503	mm/s
Motor DE 2A	1/23/2017 11:31:24 AM	12.407	mm/s
Fan DE 3HL-V	1/23/2017 11:31:35 AM	6.999	mm/s
Fan DE 3H	1/23/2017 11:31:38 AM	7.324	mm/s
Fan DE HA	1/23/2017 11:31:42 AM	1.263	g
Fan DE HEA 1	1/23/2017 11:31:45 AM	14.554	gE
Fan DE 3V	1/23/2017 11:31:58 AM	10.134	mm/s
Fan DE 3A	1/23/2017 11:32:08 AM	4.366	mm/s
Fan NDE 4HL	1/23/2017 11:32:32 AM	4.296	mm/s
Fan NDE 4H	1/23/2017 11:32:35 AM	4.472	mm/s
Fan NDE HA	1/23/2017 11:32:38 AM	0.567	g
Fan NDE HEA1	1/23/2017 11:32:42 AM	5.833	gE
Fan NDE 4V	1/23/2017 11:32:54 AM	5.968	mm/s
Fan NDE 4A	1/23/2017 11:33:05 AM	3.539	mm/s

Uncoat Fuji DC Fan \ Motor DE 2A



Uncoat Fuji DC Fan \ Fan DE 3V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	8	EQUIPMENT NAME	UNCOATED TRANSFER BLOWER
MACHINE SKETCH		 ROTARY LOBE BLOWER	

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.2 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1470 RPM	1158 RPM	At Ground	Y
Power Rating	55 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6314 6313	22310E/C3 2310 EC	Above Ground Level	N
			On Vibro Pad	N
Pulley Dia	315	400	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.1	2.2	NORMAL
BLOWER	4.7	3.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.7 mm/s recorded in the Blower bearings.

ANALYSIS:

- The system is in normal condition.

ACTION PLAN:

1. Immediate corrections are not required – Monitor the future trend.

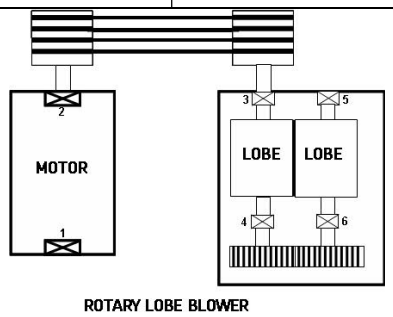
Last Measurement Report

Source: Uncoat Trans Blower

2/14/2017 3:55:20 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:54:21 AM	1.827	mm/s
Motor NDE HA	1/23/2017 10:54:25 AM	0.385	g
Motor NDE 1HgE3	1/23/2017 10:54:28 AM	1.536	gE
Motor NDE 1V	1/23/2017 10:54:38 AM	2.137	mm/s
Motor NDE 1A	1/23/2017 10:54:48 AM	1.428	mm/s
Motor DE 2H	1/23/2017 10:55:05 AM	2.227	mm/s
Motor DE HA	1/23/2017 10:55:08 AM	0.382	g
Motor DE 2HgE3	1/23/2017 10:55:11 AM	1.680	gE
Motor DE 2V	1/23/2017 10:55:22 AM	1.738	mm/s
Motor DE 2A	1/23/2017 10:55:37 AM	1.582	mm/s
Fan DE 3H	1/23/2017 10:55:44 AM	2.923	mm/s
Fan DE HA	1/23/2017 10:55:47 AM	0.636	g
Fan DE 3HgE3	1/23/2017 10:55:51 AM	5.531	gE
Fan DE 3V	1/23/2017 10:56:03 AM	3.002	mm/s
Fan DE 3A	1/23/2017 10:56:16 AM	3.286	mm/s
Fan NDE 4H	1/23/2017 10:56:25 AM	2.875	mm/s
Fan NDE HA	1/23/2017 10:56:29 AM	0.754	g
Fan NDE 4HgE3	1/23/2017 10:56:32 AM	6.910	gE
Fan NDE 4V	1/23/2017 10:56:43 AM	2.943	mm/s
Fan NDE 4A	1/23/2017 10:56:55 AM	2.745	mm/s
Point 5 HV	1/23/2017 10:57:09 AM	2.601	mm/s
Point 5 HEA	1/23/2017 10:57:12 AM	7.556	gE
Point 5 VV	1/23/2017 10:57:24 AM	4.098	mm/s
Point 5 AV	1/23/2017 10:57:36 AM	3.634	mm/s
Point 6 HV	1/23/2017 10:57:47 AM	3.155	mm/s
Point 6 HEA	1/23/2017 10:57:51 AM	14.278	gE
Point 6 VV	1/23/2017 10:58:03 AM	3.759	mm/s
Point 6 AV	1/23/2017 10:58:16 AM	3.667	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	9	EQUIPMENT NAME	COATED TRANSFER BLOWER
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.2 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1475 RPM	1100 RPM	At Ground	Y
Power Rating	45 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6313 6313	22310E/C3 2310 EC	Above Ground Level On Vibro Pad	N N
Pulley Dia	250	335	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	5.5	4.4	NORMAL
BLOWER	5.6	4.8	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.8 mm/s recorded in the Blower bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards after root blower replacement.

ACTION PLAN:

1. Immediate corrections are not required – Monitor the future trend.

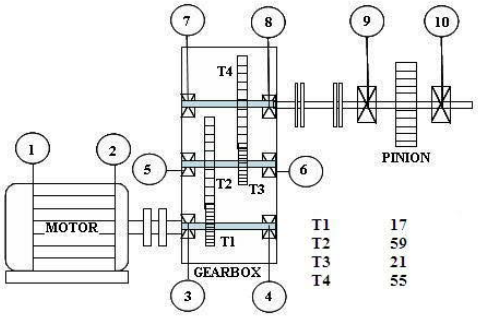
Last Measurement Report

Source: Coat. Trans Blower

2/14/2017 3:55:47 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:47:35 AM	2.998	mm/s
Motor NDE 1HL	1/23/2017 10:47:39 AM	3.292	mm/s
Motor NDE HA	1/23/2017 10:47:42 AM	0.406	g
Motor NDE 1HgE3	1/23/2017 10:47:46 AM	2.241	gE
Motor NDE 1V	1/23/2017 10:47:56 AM	3.278	mm/s
Motor NDE 1A	1/23/2017 10:48:05 AM	3.476	mm/s
Motor DE 2H	1/23/2017 10:48:14 AM	2.746	mm/s
Motor DE HA	1/23/2017 10:48:18 AM	0.520	g
Motor DE 2HgE3	1/23/2017 10:48:21 AM	1.844	gE
Motor DE 2V	1/23/2017 10:48:31 AM	2.517	mm/s
Motor DE 2A	1/23/2017 10:48:42 AM	4.420	mm/s
Fan DE 3H	1/23/2017 10:48:50 AM	4.213	mm/s
Fan DE HA	1/23/2017 10:48:53 AM	0.902	g
Fan DE 3HgE3	1/23/2017 10:48:56 AM	7.392	gE
Fan DE 3V	1/23/2017 10:49:20 AM	3.352	mm/s
Fan DE 3A	1/23/2017 10:49:28 AM	3.777	mm/s
Fan NDE 4H	1/23/2017 10:49:38 AM	3.690	mm/s
Fan NDE 4V	1/23/2017 10:49:48 AM	3.183	mm/s
Fan NDE HA	1/23/2017 10:49:58 AM	0.754	g
Fan NDE 4HgE3	1/23/2017 10:50:01 AM	0.004	gE
Fan NDE 4A	1/23/2017 10:50:11 AM	4.184	mm/s
Point 5 HV	1/23/2017 10:50:21 AM	3.938	mm/s
Point 5 HEA	1/23/2017 10:50:24 AM	7.041	gE
Point 5 VV	1/23/2017 10:50:35 AM	3.067	mm/s
Point 5 AV	1/23/2017 10:50:46 AM	3.786	mm/s
Point 6 HV	1/23/2017 10:50:56 AM	3.474	mm/s
Point 6 HEA	1/23/2017 10:51:01 AM	7.821	gE
Point 6 VV	1/23/2017 10:51:16 AM	4.894	mm/s
Point 6 AV	1/23/2017 10:51:29 AM	4.348	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	10	EQUIPMENT NAME	BALL MILL
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR/GEARBOX/PINION	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1500 RPM	GB O/P-166.76 BM speed-20	At Ground	Y
Power Rating	640 KW	NA	On Rigid Concrete	Y
Bearing No. (DE/NDE)	6322/C3 VL 20171 6324	Pos 9-23140 CC/W33 Pos 10-23140 CC/W33	Above Ground Level	N
			On Vibro Pad	N
Pulley Dia	NA	NA	On Steel Structure	N

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	2.2	2.1	NORMAL
GEARBOX	3.8	3.9	NORMAL
PINION	3.4	3.4	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.9 mm/s recorded at the Gearbox bearings.

ANALYSIS:

- Symptoms of improper tooth loading symptoms observed at gearbox intermediate gear.

ACTION PLAN:

1. Amplitude of GMFs are in trend at gearbox intermediate shaft.
2. Second order GMF is dominating the FFT spectra. It is suggested to keep close monitoring over any abnormal behavior of equipment.

Last Measurement Report

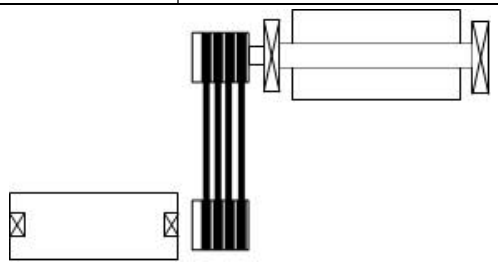
Source: BALL MILL

2/14/2017 3:56:12 PM

	Last Measurement		
POINT name	**Date/Time**	**Last value**	**Units**
MOTOR NDE HV	1/23/2017 10:59:13 AM	1.097	mm/s
MOTOR NDE HV.1	1/23/2017 10:59:16 AM	1.264	mm/s
MOTOR NDE HA	1/23/2017 10:59:19 AM	0.850	g
MOTOR NDE HEA 1	1/23/2017 10:59:22 AM	1.490	gE
MOTOR NDE HEA 2	1/23/2017 10:59:25 AM	3.942	gE
MOTOR NDE VV	1/23/2017 10:59:35 AM	2.152	mm/s
MOTOR NDE AV	1/23/2017 10:59:45 AM	1.015	mm/s
MOTOR DE HV	1/23/2017 10:59:59 AM	1.609	mm/s
MOTOR DE HV.1	1/23/2017 11:00:02 AM	1.479	mm/s
MOTOR DE HA	1/23/2017 11:00:05 AM	0.349	g
MOTOR DE HEA 1	1/23/2017 11:00:09 AM	1.419	gE
MOTOR DE HEA 2	1/23/2017 11:00:12 AM	6.041	gE
MOTOR DE VV	1/23/2017 11:00:35 AM	1.239	mm/s
MOTOR DE AV	1/23/2017 11:00:46 AM	1.988	mm/s
GB I/P DE HV-H	1/23/2017 11:07:42 AM	2.058	mm/s
GB I/P DE HV.L	1/23/2017 11:07:46 AM	1.360	mm/s
GB I/P DE HA	1/23/2017 11:07:49 AM	2.208	g
GB I/P DE HEA 1	1/23/2017 11:07:53 AM	2.933	gE
GB I/P DE HEA 2	1/23/2017 11:07:56 AM	8.275	gE
GB I/P DE VV	1/23/2017 11:08:07 AM	1.690	mm/s
GB I/P DE AV	1/23/2017 11:08:18 AM	1.659	mm/s
GB I/P NDE HV	1/23/2017 11:08:42 AM	1.340	mm/s
GB I/P NDE HV.L	1/23/2017 11:08:45 AM	3.900	mm/s
GB I/P NDE HA	1/23/2017 11:08:48 AM	5.529	g
GB I/P NDE HEA1	1/23/2017 11:08:52 AM	2.994	gE
GB I/P NDE HEA2	1/23/2017 11:08:55 AM	6.787	gE
GB I/P NDE VV	1/23/2017 11:09:10 AM	1.266	mm/s
GB I/P NDE AV	1/23/2017 11:09:23 AM	1.795	mm/s
GB INTER DE HV	1/23/2017 11:01:02 AM	1.852	mm/s
GB INTER DE HV.L	1/23/2017 11:01:07 AM	1.758	mm/s
GB INTER DE HA	1/23/2017 11:01:10 AM	1.843	g
GB INTER DE HEA1	1/23/2017 11:01:13 AM	4.486	gE
GB INTER DE HEA 2	1/23/2017 11:01:16 AM	13.876	gE

Last Measurement

POINT name	Date/Time	Last value	Units
GB INTER DE VV	1/23/2017 11:01:29 AM	1.308	mm/s
GB INTER DE - AV	1/23/2017 11:01:40 AM	1.617	mm/s
GB INTER NDE HV	1/23/2017 11:09:49 AM	1.509	mm/s
GB INTER NDE HV.L	1/23/2017 11:09:53 AM	1.591	mm/s
GB INTER NDE HA	1/23/2017 11:09:56 AM	3.816	g
GB INTER NDE HEA1	1/23/2017 11:09:59 AM	2.804	gE
GB INTER NDE HEA2	1/23/2017 11:10:02 AM	7.142	gE
GB INTER NDE VV	1/23/2017 11:10:13 AM	2.123	mm/s
GB INTER NDE AV	1/23/2017 11:10:23 AM	1.978	mm/s
GB O/P DE - HV-L	1/23/2017 11:02:03 AM	1.049	mm/s
GB O/P DE - HV.H	1/23/2017 11:02:08 AM	1.114	mm/s
GB O/P DE HA	1/23/2017 11:02:13 AM	0.194	g
GB O/P DE HEA 1	1/23/2017 11:02:25 AM	1.134	gE
GB O/P DE HEA 2	1/23/2017 11:02:37 AM	4.115	gE
GB O/P DE VV	1/23/2017 11:02:53 AM	1.008	mm/s
GB O/P DE - AV	1/23/2017 11:03:06 AM	1.399	mm/s
GB O/P NDE HV-L	1/23/2017 11:03:26 AM	1.295	mm/s
GB O/P NDE HV.H	1/23/2017 11:03:31 AM	1.344	mm/s
GB O/P NDE HA	1/23/2017 11:03:36 AM	0.228	g
GB O/P NDE HEA1	1/23/2017 11:03:48 AM	1.176	gE
GB O/P NDE HEA2	1/23/2017 11:04:00 AM	2.411	gE
GB O/P NDE VV	1/23/2017 11:04:17 AM	1.001	mm/s
GB O/P NDE AV	1/23/2017 11:04:29 AM	1.316	mm/s
PINION DE HV	1/23/2017 11:04:53 AM	2.968	mm/s
PINION DE HV.H	1/23/2017 11:04:59 AM	3.067	mm/s
PINION DE HEA1	1/23/2017 11:05:11 AM	1.354	gE
PINION DE HEA2	1/23/2017 11:05:23 AM	1.069	gE
PINION DE VV	1/23/2017 11:06:03 AM	1.669	mm/s
PINION DE AV	1/23/2017 11:06:21 AM	2.251	mm/s
PINION NDE HV	1/23/2017 11:10:58 AM	3.430	mm/s
PINION NDE HV.H	1/23/2017 11:11:05 AM	3.473	mm/s
PINION NDE HEA1	1/23/2017 11:11:17 AM	1.949	gE
PINION NDE HEA2	1/23/2017 11:11:29 AM	1.469	gE
PINION NDE VV	1/23/2017 11:12:01 AM	3.259	mm/s
PINION NDE AV	1/23/2017 11:12:17 AM	2.851	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	11	EQUIPMENT NAME	HAMMER MILL – RIGHT (DRIVE NO.1)
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / HAMMER SHAFT	7.1	7.2 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1480 RPM	1200 RPM	At Ground	N
Power Rating	160 KW	NA	On Rigid Concrete	Y
Bearing No. (DE/NDE)	6319 6319	22320 C3 22320 C3	Above Ground Level On Vibro Pad	Y Y
Pulley Dia	400	500	On Steel Structure	N

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	10.8	8.1	ALERT
HAMMER SHAFT	4.8 (23.9 gE)	8.3 (23.5 gE)	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 8.3 mm/s recorded in the Motor bearings.

ANALYSIS:

- Overall health condition of the equipment is in NORMAL condition, though vibrations at motor bearings varying within a long range due to inadequate rigidity to the system, hence can't be kept under NORMAL range.

ACTION PLAN:

1. High vibrations are due to flexible base rigidity. As the vibrations are now almost stable, OEM to be consult for acceptable vibration range for such flexible structure in order to verify the equipment health condition. Trend monitoring is suggested.

Last Measurement Report

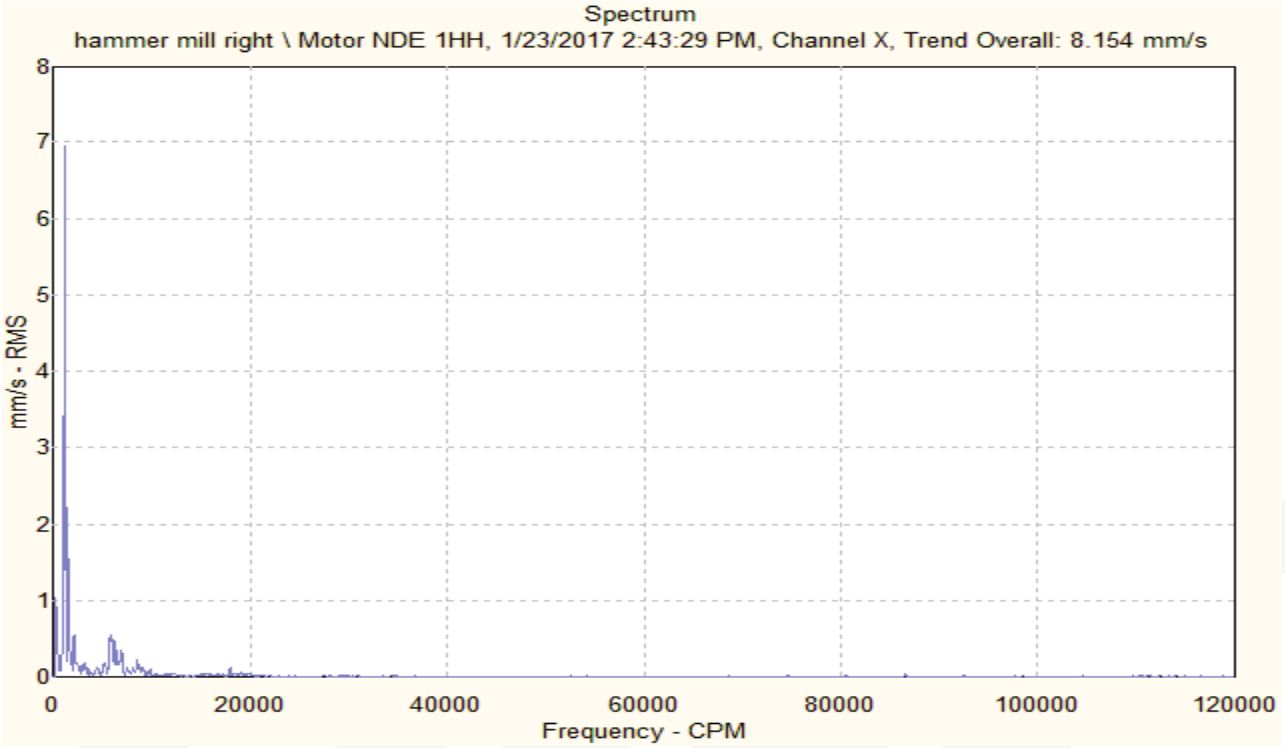
Source: hammer mill right

2/14/2017 3:56:51 PM

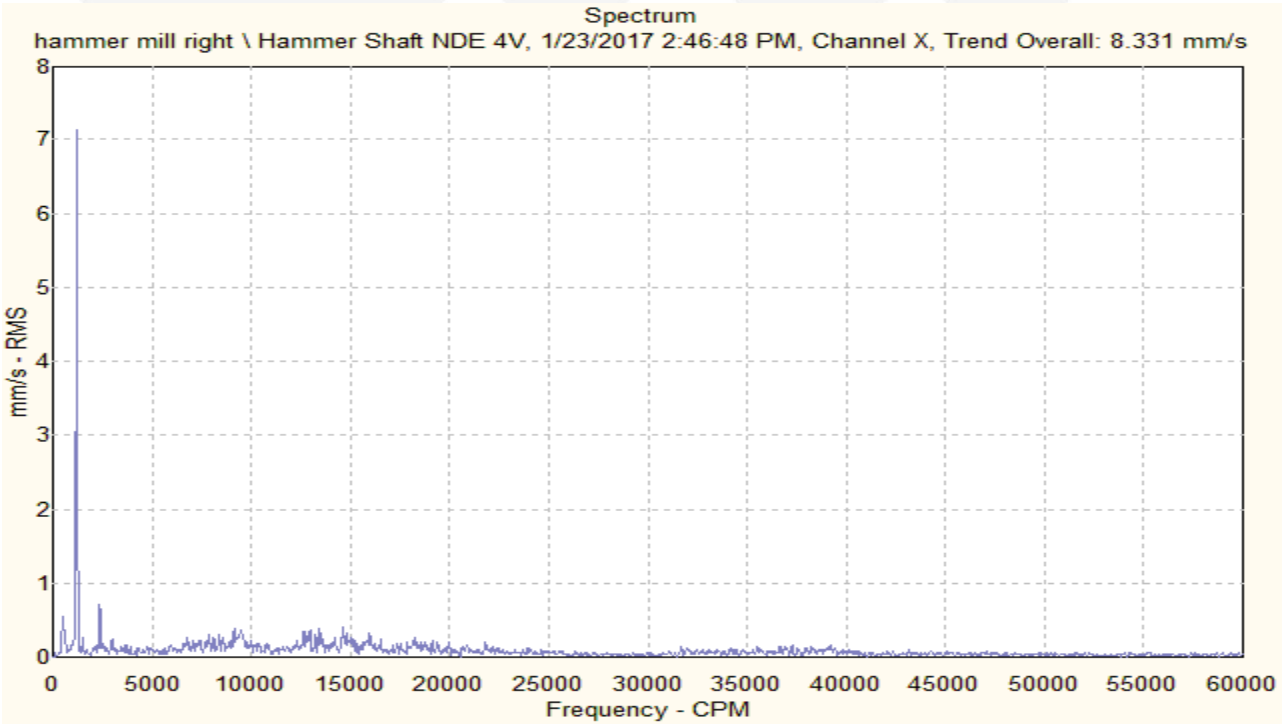
Last Measurement

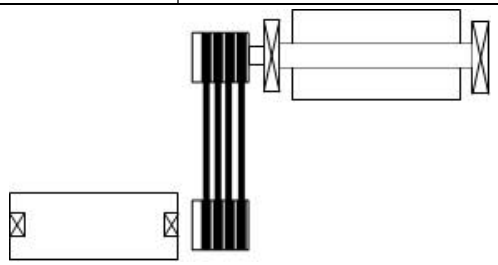
POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 2:43:26 PM	7.606	mm/s
Motor NDE 1HH	1/23/2017 2:43:29 PM	8.154	mm/s
Motor NDE HA	1/23/2017 2:43:33 PM	0.201	g
Motor NDE 1HgE3	1/23/2017 2:43:36 PM	1.526	gE
Motor NDE 1V	1/23/2017 2:43:48 PM	7.752	mm/s
Motor NDE 1A	1/23/2017 2:43:58 PM	7.537	mm/s
Motor DE 2HL	1/23/2017 2:44:11 PM	5.149	mm/s
Motor DE 2H	1/23/2017 2:44:14 PM	4.326	mm/s
Motor DE HA	1/23/2017 2:44:18 PM	0.231	g
Motor DE 2HgE3	1/23/2017 2:44:21 PM	3.284	gE
Motor DE 2V	1/23/2017 2:44:31 PM	5.655	mm/s
Motor DE 2A	1/23/2017 2:44:43 PM	7.953	mm/s
Hammer Shaft DE 3HL	1/23/2017 2:44:59 PM	3.545	mm/s
Hammer Shaft DE 3H	1/23/2017 2:45:03 PM	3.246	mm/s
Hammer Shaft DE HA	1/23/2017 2:45:06 PM	1.337	g
Hammer ShaftDE 3HgE3	1/23/2017 2:45:12 PM	25.225	gE
Hammer Shaft DE 3V	1/23/2017 2:45:31 PM	4.540	mm/s
Hammer Shaft DE 3A	1/23/2017 2:45:45 PM	3.924	mm/s
Hammer Shaft NDE 4HL	1/23/2017 2:46:07 PM	4.028	mm/s
Hammer Shaft NDE 4H	1/23/2017 2:46:11 PM	4.178	mm/s
Hammer Shaft NDE HA	1/23/2017 2:46:24 PM	1.238	g
Hammer ShafNDE 4HgE3	1/23/2017 2:46:35 PM	23.550	gE
Hammer Shaft NDE 4V	1/23/2017 2:46:48 PM	8.331	mm/s
Hammer Shaft NDE 4A	1/23/2017 2:47:03 PM	4.060	mm/s

hammer mill right \ Motor NDE 1HH



hammer mill right \ Hammer Shaft NDE 4V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	12	EQUIPMENT NAME	HAMMER MILL – LEFT (DRIVE NO.2)
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / HAMMER SHAFT	7.1	7.2 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1480 RPM	1200 RPM	At Ground	N
Power Rating	160 KW	NA	On Rigid Concrete	Y
Bearing No. (DE/NDE)	6319 6319	22320 C3 22320 C3	Above Ground Level On Vibro Pad	Y Y
Pulley Dia	400	500	On Steel Structure	N

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	8.1	7.0	NORMAL
HAMMER SHAFT	4.4 (17.1 gE)	4.1 (28.6 gE)	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 7.0 mm/s recorded in the Motor bearings.

ANALYSIS:

- Overall health condition of the equipment is in NORMAL condition, though vibrations at motor bearings varying within a long range due to inadequate rigidity to the system, hence can't be kept under NORMAL range.

ACTION PLAN:

1. High vibrations are due to flexible base rigidity. As the vibrations are now almost stable, OEM to be consult for acceptable vibration range for such flexible structure in order to verify the equipment health condition. Trend monitoring is suggested.

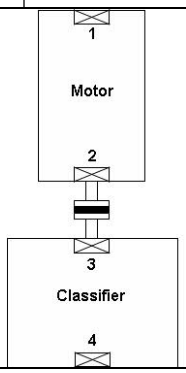
Last Measurement Report

Source: Hammer Mill Left

2/14/2017 3:57:49 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 2:47:24 PM	4.946	mm/s
Motor NDE 1HL	1/23/2017 2:47:27 PM	7.098	mm/s
Motor NDE HA	1/23/2017 2:47:30 PM	0.333	g
Motor NDE 1HgE3	1/23/2017 2:47:34 PM	3.193	gE
Motor NDE 1V	1/23/2017 2:48:01 PM	3.529	mm/s
Motor NDE 1A	1/23/2017 2:48:39 PM	3.764	mm/s
Motor DE 2HL	1/23/2017 2:48:51 PM	6.645	mm/s
Motor DE 2H	1/23/2017 2:48:54 PM	5.535	mm/s
Motor DE HA	1/23/2017 2:48:58 PM	0.190	g
Motor DE 2HgE3	1/23/2017 2:49:01 PM	4.714	gE
Motor DE 2V	1/23/2017 2:49:14 PM	2.830	mm/s
Motor DE 2A	1/23/2017 2:49:26 PM	6.633	mm/s
Hammer Shaft DE 3HL	1/23/2017 2:49:43 PM	3.645	mm/s
Hammer Shaft DE 3H	1/23/2017 2:49:46 PM	4.169	mm/s
Hammer Shaft DE HA	1/23/2017 2:49:49 PM	1.154	g
Hammer Shaft DE 3Hg	1/23/2017 2:49:54 PM	10.016	gE
Hammer Shaft DE 3V	1/23/2017 2:50:06 PM	3.547	mm/s
Hammer Shaft DE 3A	1/23/2017 2:50:21 PM	4.438	mm/s
Hammer Shaft NDE 4HL	1/23/2017 2:50:41 PM	3.797	mm/s
Hammer Shaft NDE 4H	1/23/2017 2:50:45 PM	3.439	mm/s
Hammer ShaftNDE HA	1/23/2017 2:50:49 PM	1.672	g
Hammer Shaft NDE 4Hg	1/23/2017 2:50:57 PM	28.675	gE
Hammer Shaft NDE 4V	1/23/2017 2:51:10 PM	3.373	mm/s
Hammer Shaft NDE 4A	1/23/2017 2:51:28 PM	3.976	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	13	EQUIPMENT NAME	CLASSIFIER DRIVE
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / CLASSIFIER	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2300 RPM	2300 RPM	At Ground	N
Power Rating	160 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6319 C3 6316 C3	22214 C3 22214 C3 & 29414 E	Above Ground Level	Y
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.0	3.0	NORMAL
CLASSIFIER	3.6 (16.2 gE)	4.3 (9.9 gE)	NORMAL

OBSERVATIONS:

This equipment is indicating a "NORMAL" behavior with maximum vibration amplitudes of 4.3 mm/s recorded in the Classifier bearings.

ANALYSIS:

- Though, Harmonics of 6th order fundamental frequency with slight sidebands of 930 CPM delta observed indicating abnormality with rotor assembly, indicating aerodynamic forces generated looseness in the system coupled with minor unbalance. Associated bearing fault frequency at classifier NDE bearing's outer race passing symptoms indicated with considerable amplitude.

ACTION PLAN:

1. It is suggested to inspect the classifier NDE bearing on earliest available opportunity for initial bearing inaccuracy & follow routine coating cleaning accumulated on classifier rotor. Rotor assembly, specifically newly modified vortex breaker blades to be inspected for any abnormality on available opportunity.

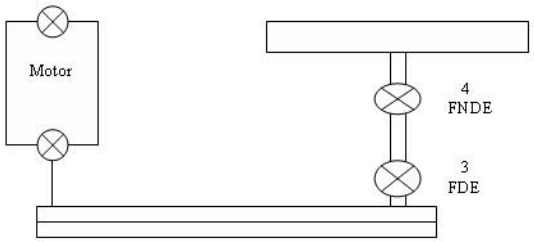
Last Measurement Report

Source: classifier

2/14/2017 3:58:28 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1HL	1/23/2017 10:01:16 AM	2.791	mm/s
Motor NDE 1H	1/23/2017 10:01:20 AM	3.086	mm/s
Motor NDE HA	1/23/2017 10:01:23 AM	0.729	g
Motor NDE 1HgE3	1/23/2017 10:01:26 AM	6.112	gE
Motor NDE 1V	1/23/2017 10:01:45 AM	1.634	mm/s
Motor NDE 1A	1/23/2017 10:01:56 AM	0.714	mm/s
Motor DE 2HL	1/23/2017 10:02:10 AM	1.141	mm/s
Motor DE 2H	1/23/2017 10:02:14 AM	1.233	mm/s
Motor DE HA	1/23/2017 10:02:17 AM	0.857	g
Motor DE 2HgE3	1/23/2017 10:02:20 AM	7.317	gE
Motor DE 2V	1/23/2017 10:02:35 AM	0.970	mm/s
Motor DE 2A	1/23/2017 10:02:48 AM	1.098	mm/s
Classifier Top 3HL	1/23/2017 10:03:00 AM	1.431	mm/s
Classifier Top 3H	1/23/2017 10:03:04 AM	1.273	mm/s
Classifier Top HA	1/23/2017 10:03:07 AM	0.064	g
Classifier Top 3Hg	1/23/2017 10:03:11 AM	1.708	gE
Classifier Top 3V	1/23/2017 10:03:26 AM	0.521	mm/s
Classifier Top 3A	1/23/2017 10:03:41 AM	0.945	mm/s
Classifier Bottom4HL	1/23/2017 10:45:44 AM	4.023	mm/s
Classifier Bottom 4H	1/23/2017 10:45:48 AM	4.375	mm/s
Classifier Bottom HA	1/23/2017 10:45:51 AM	1.725	g
Classifier Botto 4Hg	1/23/2017 10:45:54 AM	9.947	gE
Classifier Bottom 4V	1/23/2017 10:46:10 AM	1.791	mm/s
Classifier Bottom 4A	1/23/2017 10:46:26 AM	1.545	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	14	EQUIPMENT NAME	DE-AGGLOMETER
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / AGLOMETER	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1470 RPM	2573 RPM	At Ground	Y
Power Rating	37 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6313 6312	NUP2211C3 NU 2212C3	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	280	160	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	2.4	3.4	NORMAL
AGLOMETER	2.5	2.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.4 mm/s recorded in the Aglometer bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO Standards.

ACTION PLAN:

1. Its is suggested to keep close monitoring over change in any parameter during routine physical observations.

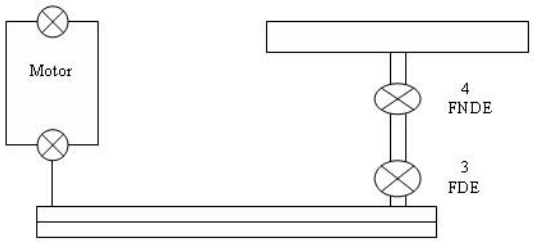
Last Measurement Report

Source: DE AGGLOMETER

2/14/2017 3:58:56 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1HL	1/23/2017 11:13:10 AM	2.312	mm/s
Motor NDE 1H	1/23/2017 11:13:14 AM	2.393	mm/s
Motor NDE HA	1/23/2017 11:13:17 AM	0.205	g
Motor NDE 1HgE3	1/23/2017 11:13:20 AM	0.778	gE
Motor NDE 1V	1/23/2017 11:13:31 AM	2.323	mm/s
Motor NDE 1A	1/23/2017 11:13:42 AM	2.530	mm/s
Motor DE 2HL	1/23/2017 11:13:55 AM	2.419	mm/s
Motor DE 2H	1/23/2017 11:13:58 AM	2.485	mm/s
Motor DE HA	1/23/2017 11:14:02 AM	0.171	g
Motor DE 2HgE3	1/23/2017 11:14:05 AM	0.750	gE
Motor DE 2V	1/23/2017 11:14:31 AM	2.538	mm/s
Motor DE 2A	1/23/2017 11:14:57 AM	3.430	mm/s
Agglo DE 3HL	1/23/2017 11:15:19 AM	2.775	mm/s
AggloDE 3H	1/23/2017 11:15:22 AM	2.471	mm/s
Agglo DE HA	1/23/2017 11:15:25 AM	0.291	g
Agglo DE 3HgE3	1/23/2017 11:15:29 AM	3.318	gE
Agglo DE 3V	1/23/2017 11:15:56 AM	3.146	mm/s
Agglo DE 3A	1/23/2017 11:16:09 AM	2.047	mm/s
Agglo NDE 4HL	1/23/2017 11:16:19 AM	2.102	mm/s
Agglo NDE 4H	1/23/2017 11:16:22 AM	2.290	mm/s
Agglo NDE HA	1/23/2017 11:16:26 AM	0.141	g
Agglo NDE 4HgE3	1/23/2017 11:16:29 AM	1.024	gE
Agglo NDE 4V	1/23/2017 11:16:43 AM	1.455	mm/s
Agglo NDE 4A	1/23/2017 11:16:55 AM	2.423	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	15	EQUIPMENT NAME	BLENDER – HOUSING SIDE
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLENDER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2920 RPM	2336 RPM	At Ground	N
Power Rating	55 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	NU 215 EC3 6215 C3	NU-312ECP 6312 ZZC3	Above Ground Level	Y
			On Vibro Pad	Y
Pulley Dia	200	250	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	5.5	4.2	NORMAL
BLENDER	3.7	3.0	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.2 mm/s recorded in the Motor bearings.

ANALYSIS:

- Minor symptoms of belt pulley misalignment have been indicated in FFT spectra.

ACTION PLAN:

1. Verify belt pulley alignment and belt tension for any abnormality.
2. Also check motor base foundation bolts & rubber dampers for proper functioning.

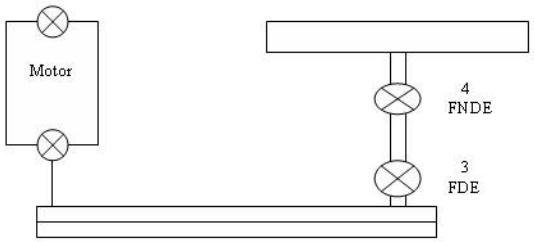
Last Measurement Report

Source: BLENDER HOUSING SIDE

2/14/2017 3:59:23 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 11:21:06 AM	3.927	mm/s
Motor NDE 1HL	1/23/2017 11:21:09 AM	3.796	mm/s
Motor NDE HA	1/23/2017 11:21:12 AM	0.284	g
Motor NDE 1HgE3	1/23/2017 11:21:16 AM	3.148	gE
Motor NDE 1V	1/23/2017 11:21:29 AM	4.050	mm/s
Motor NDE 1A	1/23/2017 11:21:41 AM	4.264	mm/s
Motor DE 2HL	1/23/2017 11:21:53 AM	2.450	mm/s
Motor DE 2H	1/23/2017 11:21:57 AM	2.565	mm/s
Motor DE HA	1/23/2017 11:22:00 AM	0.297	g
Motor DE 2HgE3	1/23/2017 11:22:03 AM	2.777	gE
Motor DE 2V	1/23/2017 11:22:16 AM	3.246	mm/s
Motor DE 2A	1/23/2017 11:22:47 AM	3.888	mm/s
Blender DE 3HL	1/23/2017 2:40:26 PM	2.964	mm/s
Blender DE 3H	1/23/2017 2:40:30 PM	3.059	mm/s
Blender DE HA	1/23/2017 2:40:34 PM	0.177	g
Blender DE HEA	1/23/2017 2:40:37 PM	2.291	gE
Blender DE 3V	1/23/2017 2:41:34 PM	2.224	mm/s
Blender DE 3A	1/23/2017 2:41:46 PM	2.796	mm/s
Blender NDE 4HL	1/23/2017 2:40:54 PM	2.845	mm/s
Blender NDE 4H	1/23/2017 2:40:57 PM	2.810	mm/s
Blender NDE HA	1/23/2017 2:41:01 PM	0.180	g
Blender NDE HEA	1/23/2017 2:41:04 PM	2.175	gE
Blender NDE 4V	1/23/2017 2:41:21 PM	2.260	mm/s
Blender NDE 4A	1/23/2017 2:41:58 PM	2.659	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	16	EQUIPMENT NAME	BLENDER – DOOR SIDE
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLENDER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2920 RPM	2265 RPM	At Ground	N
Power Rating	55 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	NU 215 EC3 6215 C3	NU 312 6312	Above Ground Level	Y
			On Vibro Pad	Y
Pulley Dia	180	236	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	7.6	8.6	ALERT
BLENDER	4.2	4.0	NORMAL

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 8.6 mm/s recorded in the Motor bearings.

ANALYSIS:

- Vibrations trending in ALERT range as per the previous history.
- Symptoms of belt pulley misalignment have been indicated in FFT spectra.

ACTION PLAN:

1. Verify belt pulley alignment and belt tension for proper functioning. If possible additional stiffening can be provided to motor foundation to reduce vibrations further.

Last Measurement Report

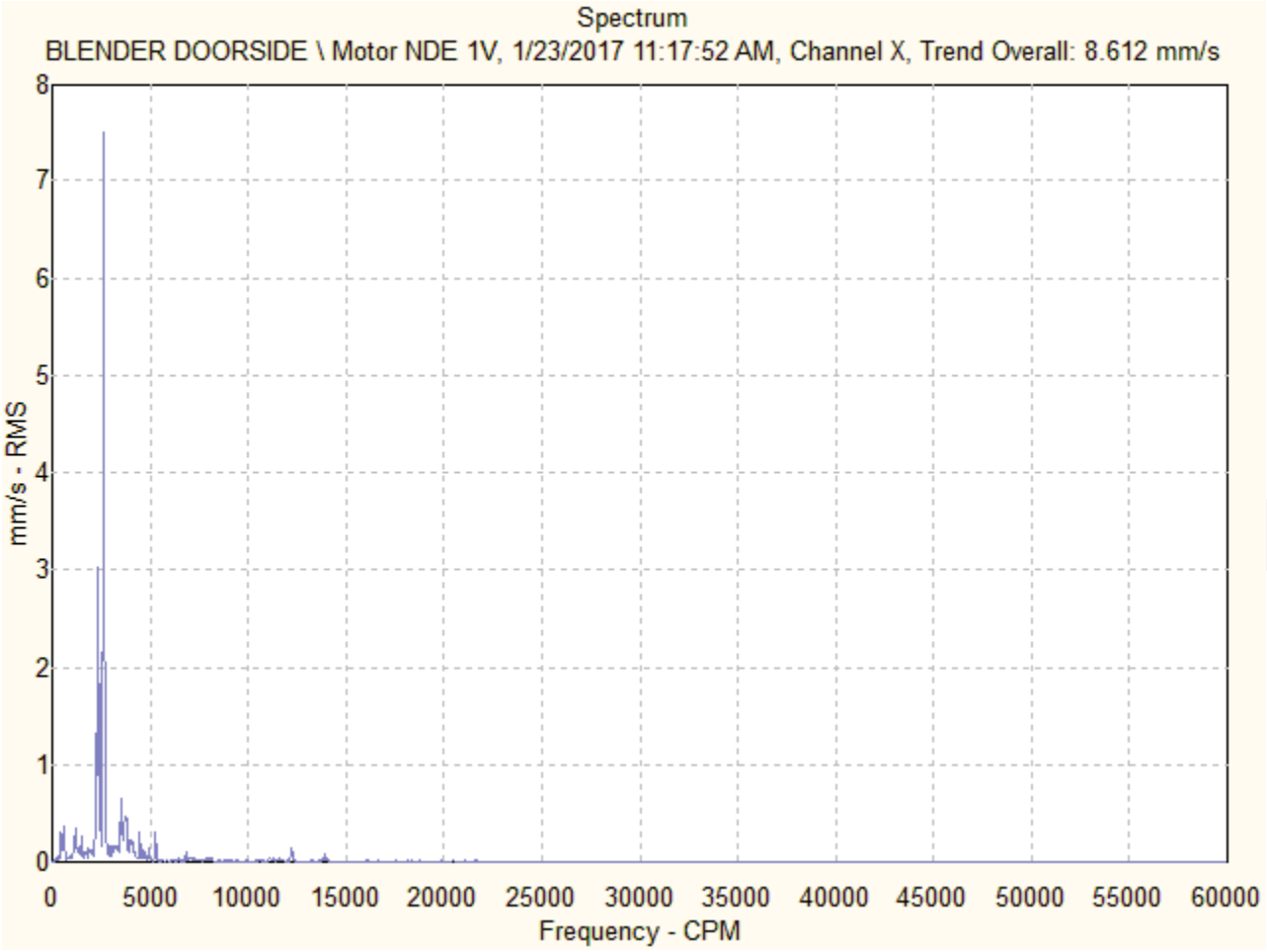
Source: BLENDER DOORSIDE

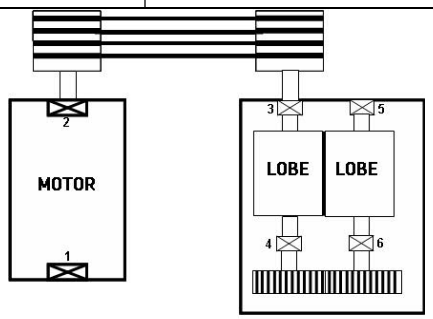
2/14/2017 3:59:50 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 11:17:24 AM	3.227	mm/s
Motor NDE 1HL	1/23/2017 11:17:27 AM	3.917	mm/s
Motor NDE HA	1/23/2017 11:17:30 AM	0.267	g
Motor NDE 1HgE3	1/23/2017 11:17:34 AM	1.607	gE
Motor NDE 1V	1/23/2017 11:17:52 AM	8.612	mm/s
Motor NDE 1A	1/23/2017 11:17:56 AM	7.152	mm/s
Motor DE 2HL	1/23/2017 11:18:13 AM	4.196	mm/s
Motor DE 2H	1/23/2017 11:18:16 AM	4.129	mm/s
Motor DE HA	1/23/2017 11:18:20 AM	0.235	g
Motor DE 2HgE3	1/23/2017 11:18:23 AM	4.033	gE
Motor DE 2V	1/23/2017 11:18:36 AM	7.791	mm/s
Motor DE 2A	1/23/2017 11:18:50 AM	4.565	mm/s
Blender DE 3HL-V	1/23/2017 11:19:03 AM	2.875	mm/s
Blender DE 3HV	1/23/2017 11:19:07 AM	2.813	mm/s
Blender DE HA	1/23/2017 11:19:10 AM	0.204	g
Blender DE HEA	1/23/2017 11:19:13 AM	5.611	gE
Blender DE 3VV	1/23/2017 11:19:50 AM	4.006	mm/s
Blender DE 3AV	1/23/2017 11:20:37 AM	3.490	mm/s
Blender NDE 4HL	1/23/2017 11:19:26 AM	2.773	mm/s
Blender NDE 4H	1/23/2017 11:19:30 AM	2.752	mm/s
Blender NDE 4HA	1/23/2017 11:19:33 AM	0.235	g
Blender NDE 4HEA	1/23/2017 11:19:36 AM	4.039	gE
Blender NDE 4VV	1/23/2017 11:20:05 AM	4.032	mm/s
Blender NDE 4AV	1/23/2017 11:20:17 AM	3.767	mm/s

BLENDER DOORSIDE \ Motor NDE 1V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	17	EQUIPMENT NAME	BLENDER AERATION BLOWER
MACHINE SKETCH		 ROTARY LOBE BLOWER	

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1450 RPM	725 RPM	At Ground	N
Power Rating	11 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6309 ZZ 6209ZZ	6205 ZZ 6205 ZZ	Above Ground Level	Y
			On Vibro Pad	N
Pulley Dia	125	250	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	2.1	2.1	NORMAL
BLOWER	3.9	3.9	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.9 mm/s recorded in the Blower bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO Standards but in increasing trend from past few measurements. Symptoms of improper lobe meshing are being observed.

ACTION PLAN:

1. It is suggested to inspect the blower internals for any abnormality.
2. Specially to ensure the proper root clearances & adequate air gap. Also check the suction filter for any abnormality.

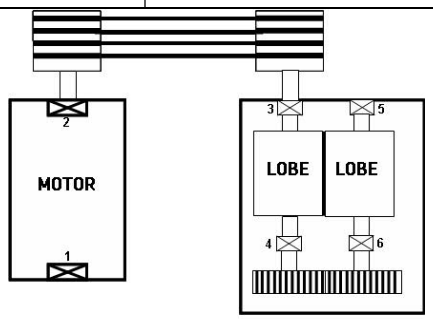
Last Measurement Report

Source: Blender Aeration Blr

2/14/2017 4:00:31 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 9:55:48 AM	1.214	mm/s
Motor NDE HA	1/23/2017 9:55:51 AM	0.162	g
Motor NDE 1HgE3	1/23/2017 9:55:54 AM	1.916	gE
Motor NDE 1V	1/23/2017 9:56:04 AM	1.378	mm/s
Motor NDE 1A	1/23/2017 9:56:18 AM	1.848	mm/s
Motor DE 2H	1/23/2017 9:56:28 AM	1.083	mm/s
Motor DE HA	1/23/2017 9:56:31 AM	0.173	g
Motor DE 2HgE3	1/23/2017 9:56:34 AM	2.198	gE
Motor DE 2V	1/23/2017 9:56:47 AM	1.843	mm/s
Motor DE 2A	1/23/2017 9:56:58 AM	1.742	mm/s
Fan DE 3H	1/23/2017 9:57:11 AM	2.117	mm/s
Fan DE 3HA	1/23/2017 9:57:14 AM	0.313	g
Fan DE 3HgE3	1/23/2017 9:57:17 AM	1.396	gE
Fan DE 3V	1/23/2017 9:57:30 AM	2.437	mm/s
Fan DE 3A	1/23/2017 9:57:41 AM	2.636	mm/s
Fan NDE 4H	1/23/2017 9:57:51 AM	1.496	mm/s
Fan NDE 4HA	1/23/2017 9:57:54 AM	0.240	g
Fan NDE 4HgE3	1/23/2017 9:57:58 AM	1.296	gE
Fan NDE 4V	1/23/2017 9:58:13 AM	1.629	mm/s
Fan NDE 4A	1/23/2017 9:58:22 AM	2.955	mm/s
Fan DE 5H	1/23/2017 9:58:42 AM	1.310	mm/s
Fan DE 5HA	1/23/2017 9:58:45 AM	0.169	g
Fan DE 5HgE3	1/23/2017 9:58:48 AM	1.968	gE
Fan DE 5V	1/23/2017 9:58:59 AM	1.215	mm/s
Fan DE 5A	1/23/2017 9:59:09 AM	3.591	mm/s
Fan NDE 6HV	1/23/2017 9:59:19 AM	2.010	mm/s
Fan NDE 6HA	1/23/2017 9:59:22 AM	0.432	g
Fan NDE 6HgE3	1/23/2017 9:59:25 AM	1.946	gE
Fan NDE 6VV	1/23/2017 9:59:48 AM	2.481	mm/s
Fan NDE 6AV	1/23/2017 10:00:00 AM	3.508	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	18	EQUIPMENT NAME	PRODUCT SILO AREATION BLOWER
MACHINE SKETCH		 ROTARY LOBE BLOWER	

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / BLOWER	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1470 RPM	1317 RPM	At Ground	N
Power Rating	22 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6310 ZZ 6310ZZ	NA	Above Ground Level	Y
			On Vibro Pad	N
Pulley Dia	224	250	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	7.3	6.9	NORMAL
BLOWER	6.4	5.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.9 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is slightly above ALERT as per ISO standards due to temporary operational changes possibly.

ACTION PLAN:

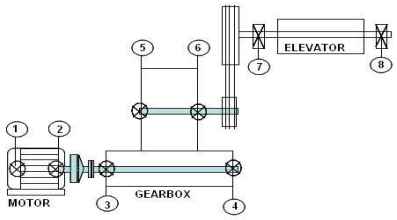
1. Its is suggested to keep close monitoring over change in any parameter during routine physical observations.

Last Measurement Report

Source: prodt siloareatioblo

2/14/2017 4:01:01 PM

POINT name	Last Measurement Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:39:36 AM	6.964	mm/s
Motor NDE HA	1/23/2017 10:39:39 AM	0.545	g
Motor NDE 1HgE3	1/23/2017 10:39:42 AM	2.076	gE
Motor NDE 1V	1/23/2017 10:39:52 AM	2.823	mm/s
Motor NDE 1A	1/23/2017 10:40:02 AM	2.859	mm/s
Motor DE 2H	1/23/2017 10:40:10 AM	6.152	mm/s
Motor DE HA	1/23/2017 10:40:14 AM	0.793	g
MOTOR DE HEA 1	1/23/2017 10:40:17 AM	2.997	gE
Motor DE 2HgE3	1/23/2017 10:40:20 AM	3.421	gE
Motor DE 2V	1/23/2017 10:40:33 AM	2.606	mm/s
Motor DE 2A	1/23/2017 10:40:43 AM	3.271	mm/s
BLOWER DE 3HV	1/23/2017 10:40:55 AM	5.110	mm/s
BLOWER DE 3HA	1/23/2017 10:40:58 AM	0.848	g
BLOWER DE 3HEA 2	1/23/2017 10:41:01 AM	4.212	gE
BLOWER DE 3VV	1/23/2017 10:41:13 AM	4.521	mm/s
BLOWER DE 3AV	1/23/2017 10:41:41 AM	4.791	mm/s
BLOWER NDE4HV	1/23/2017 10:43:04 AM	5.751	mm/s
BLOWER NDE4HA	1/23/2017 10:43:07 AM	0.995	g
BLOWER NDE4VV	1/23/2017 10:43:16 AM	4.418	mm/s
BLOWER NDE4AV	1/23/2017 10:43:24 AM	3.304	mm/s
BLOWER DE 5HV-H	1/23/2017 10:43:32 AM	5.033	mm/s
BLOWER DE 5HV.L	1/23/2017 10:43:37 AM	5.248	mm/s
BLOWER DE 5HA	1/23/2017 10:43:40 AM	1.553	g
BLOWER DE 5HEA 2	1/23/2017 10:43:43 AM	9.467	gE
BLOWER DE 5VV	1/23/2017 10:43:52 AM	6.748	mm/s
BLOWER DE 5AV	1/23/2017 10:44:00 AM	4.271	mm/s
BLOWER NDE 6HV	1/23/2017 10:44:08 AM	5.729	mm/s
BLOWER NDE 6HV.L	1/23/2017 10:44:12 AM	5.493	mm/s
BLOWER NDE 6HA	1/23/2017 10:44:15 AM	1.238	g
BLOWER NDE 6HEA2	1/23/2017 10:44:19 AM	5.434	gE
BLOWER NDE 6VV	1/23/2017 10:44:28 AM	5.081	mm/s
BLOWER NDE 6AV	1/23/2017 10:44:35 AM	4.167	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	19	EQUIPMENT NAME	BALL MILL DISCHARGE BUCKET ELEVATOR
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR/GEARBOX/ELEVATOR	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1460	GB I/P-1460 GB O/P-48.6 Pulley shaft-33	At Ground	N
Power Rating	15 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6309 ZZ 6209ZZ	Pos 3-32213 Pos 4-32213 Pos 5-32216 Pos 6-32216 Pos 7-22222 EK Pos 8-22222 EK	Above Ground Level	Y
			On Vibro Pad	N
Pulley Dia	GB Sprocket 17 teeth	BE Drum Sprocket 26 teeth	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.1	3.8	NORMAL
GEARBOX	4.3	4.9	ALERT
ELEVATOR	2.8	2.9	NORMAL

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 4.9 mm/s recorded at the Gearbox side.

ANALYSIS:

- The health condition of the equipment is ALERT as per ISO standards but slight increment in vibrations observed indicating minor misalignment induced vibrations.

ACTION PLAN:

1. It is suggested to review machine train alignment within permissible limits and reassess the alignment if required. Also check motor base bolts for slight looseness & rectify the same if needed.

Last Measurement Report

Source: DIS.BUC.ELEVATOR

2/14/2017 4:01:34 PM

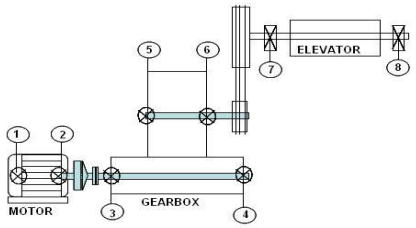
Last Measurement

POINT name	Date/Time	Last value	Units
MOTOR NDE HV	1/23/2017 10:20:52 AM	2.220	mm/s
MOTOR NDE HA	1/23/2017 10:20:55 AM	0.211	g
MOTOR NDE HEA 1	1/23/2017 10:20:58 AM	1.010	gE
MOTOR NDE HEA 2	1/23/2017 10:21:01 AM	1.082	gE
MOTOR NDE VV	1/23/2017 10:21:15 AM	3.897	mm/s
MOTOR NDE AV	1/23/2017 10:21:30 AM	3.545	mm/s
MOTOR DE HV	1/23/2017 10:21:40 AM	2.140	mm/s
MOTOR DE HA	1/23/2017 10:21:43 AM	0.092	g
MOTOR DE HEA 1	1/23/2017 10:21:46 AM	0.457	gE
MOTOR DE HEA 2	1/23/2017 10:21:50 AM	1.065	gE
MOTOR DE VV	1/23/2017 10:22:02 AM	2.745	mm/s
MOTOR DE AV	1/23/2017 10:22:14 AM	3.877	mm/s
GB I/P DE HV.L	1/23/2017 10:22:26 AM	2.063	mm/s
GB I/P DE HV-H	1/23/2017 10:22:29 AM	2.490	mm/s
GB I/P DE HA	1/23/2017 10:22:32 AM	0.106	g
GB I/P DE HEA 1	1/23/2017 10:22:36 AM	0.431	gE
GB I/P DE HEA 2	1/23/2017 10:22:39 AM	2.708	gE
GB I/P DE VV	1/23/2017 10:22:51 AM	1.561	mm/s
GB I/P DE AV	1/23/2017 10:23:01 AM	3.553	mm/s
GB O/P DE - HV-L	1/23/2017 10:23:58 AM	4.997	mm/s
GB O/P DE - HV.H	1/23/2017 10:24:03 AM	4.120	mm/s
GB O/P DE HA	1/23/2017 10:24:08 AM	0.098	g
GB O/P DE HEA 1	1/23/2017 10:24:20 AM	0.238	gE
GB O/P DE HEA 2	1/23/2017 10:24:32 AM	1.734	gE
GB O/P DE VV	1/23/2017 10:24:47 AM	1.976	mm/s
GB O/P DE - AV	1/23/2017 10:24:58 AM	3.209	mm/s
GB O/P NDE HV-L	1/23/2017 10:25:16 AM	4.493	mm/s
GB O/P NDE HV.H	1/23/2017 10:25:21 AM	4.704	mm/s
GB O/P NDE HA	1/23/2017 10:25:26 AM	0.091	g
GB O/P NDE HEA1	1/23/2017 10:25:38 AM	0.213	gE
GB O/P NDE HEA2	1/23/2017 10:25:50 AM	1.176	gE

Last Measurement

POINT name	Date/Time	Last value	Units
GB O/P NDE VV	1/23/2017 10:26:06 AM	2.095	mm/s
GB O/P NDE AV	1/23/2017 10:26:18 AM	2.820	mm/s
PINION DE HV	1/23/2017 10:26:37 AM	2.649	mm/s
PINION DE HV.H	1/23/2017 10:26:44 AM	2.426	mm/s
PINION DE HEA1	1/23/2017 10:26:56 AM	0.257	gE
PINION DE HEA2	1/23/2017 10:27:08 AM	0.447	gE
PINION DE VV	1/23/2017 10:27:26 AM	1.217	mm/s
PINION DE AV	1/23/2017 10:27:44 AM	1.651	mm/s
PINION NDE HV	1/23/2017 10:28:06 AM	2.592	mm/s
PINION NDE HV.H	1/23/2017 10:28:13 AM	2.912	mm/s
PINION NDE HEA1	1/23/2017 10:28:25 AM	0.133	gE
PINION NDE HEA2	1/23/2017 10:28:36 AM	0.044	gE
PINION NDE VV	1/23/2017 10:28:52 AM	0.965	mm/s
PINION NDE AV	1/23/2017 10:29:07 AM	1.359	mm/s

DIS.BUC.ELEVATOR \ GB O/P DE - HV-L

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	20	EQUIPMENT NAME	SILO FEED BUCKET ELEVATOR
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR/GEARBOX/ELEVATOR	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS

DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1470	GB I/P-1470 GB O/P-73.5 Pulley shaft-33	At Ground	N
Power Rating	30 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6312 ZZ 6310ZZ	Pos 3-32216 Pos 4-32216 Pos 5-33019 Pos 6-33019 Pos 7-22222 EK Pos 8-22222 EK	Above Ground Level	Y
			On Vibro Pad	N
Pulley Dia	GB Sprocket 15 teeth	BE Drum Sprocket 33 teeth	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION

LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.5	3.6	NORMAL
GEARBOX	3.9	3.8	NORMAL
ELEVATOR	4.2	3.6	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.8 mm/s recorded in the Gearbox bearings.

ANALYSIS:

- Vibrations are stable at NORMAL range as per the previous trend with symptoms of minor structural & rotational looseness and minor misalignment.

ACTION PLAN:

1. It is suggested to check motor base bolts for soft foot and verify alignment within the system.
2. Also check motor base bolts for equally balanced tightening on available opportunity.

Last Measurement Report

Source: FEED SILO ELEVATOR

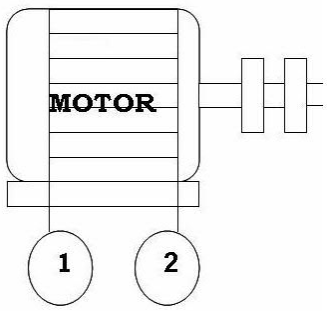
2/14/2017 4:02:25 PM

Last Measurement

POINT name	Date/Time	Last value	Units
MOTOR NDE HV	1/23/2017 2:59:19 PM	3.607	mm/s
MOTOR NDE HA	1/23/2017 2:59:22 PM	0.181	g
MOTOR NDE HEA 1	1/23/2017 2:59:26 PM	0.920	gE
MOTOR NDE HEA 2	1/23/2017 2:59:29 PM	0.550	gE
MOTOR NDE VV	1/23/2017 2:59:42 PM	3.191	mm/s
MOTOR NDE AV	1/23/2017 2:59:52 PM	2.243	mm/s
MOTOR DE HV	1/23/2017 3:00:00 PM	3.580	mm/s
MOTOR DE HA	1/23/2017 3:00:03 PM	0.255	g
MOTOR DE HEA 1	1/23/2017 3:00:07 PM	1.082	gE
MOTOR DE HEA 2	1/23/2017 3:00:11 PM	1.395	gE
MOTOR DE VV	1/23/2017 3:00:23 PM	3.055	mm/s
MOTOR DE AV	1/23/2017 3:00:33 PM	2.449	mm/s
GB I/P DE HV-H	1/23/2017 3:00:43 PM	2.271	mm/s
GB I/P DE HV.L	1/23/2017 3:00:48 PM	2.640	mm/s
GB I/P DE HA	1/23/2017 3:00:52 PM	0.163	g
GB I/P DE HEA 1	1/23/2017 3:00:56 PM	0.731	gE
GB I/P DE HEA 2	1/23/2017 3:01:00 PM	0.626	gE
GB I/P DE VV	1/23/2017 3:01:12 PM	3.170	mm/s
GB I/P DE AV	1/23/2017 3:01:43 PM	2.446	mm/s
GB O/P DE - HV-L	1/23/2017 3:02:09 PM	2.866	mm/s
GB O/P DE - HV.H	1/23/2017 3:02:15 PM	3.139	mm/s
GB O/P DE HA	1/23/2017 3:02:20 PM	0.129	g
GB O/P DE HEA 1	1/23/2017 3:02:33 PM	0.525	gE
GB O/P DE HEA 2	1/23/2017 3:02:45 PM	2.056	gE
GB O/P DE VV	1/23/2017 3:03:01 PM	3.099	mm/s
GB O/P DE - AV	1/23/2017 3:03:46 PM	3.840	mm/s
GB O/P NDE HV-L	1/23/2017 3:04:11 PM	2.983	mm/s
GB O/P NDE HV.H	1/23/2017 3:04:16 PM	2.757	mm/s
GB O/P NDE HA	1/23/2017 3:04:22 PM	0.114	g
GB O/P NDE HEA1	1/23/2017 3:04:34 PM	0.482	gE
GB O/P NDE HEA2	1/23/2017 3:04:46 PM	0.656	gE

Last Measurement

POINT name	Date/Time	Last value	Units
GB O/P NDE VV	1/23/2017 3:05:06 PM	3.225	mm/s
GB O/P NDE AV	1/23/2017 3:05:17 PM	3.525	mm/s
PINION DE HV	1/23/2017 3:05:38 PM	3.667	mm/s
PINION DE HV.H	1/23/2017 3:05:45 PM	3.602	mm/s
PINION DE HEA1	1/23/2017 3:05:57 PM	0.370	gE
PINION DE HEA2	1/23/2017 3:06:09 PM	0.719	gE
PINION DE VV	1/23/2017 3:06:42 PM	2.272	mm/s
PINION DE AV	1/23/2017 3:07:03 PM	2.866	mm/s
PINION NDE HV	1/23/2017 3:07:50 PM	3.173	mm/s
PINION NDE HV.H	1/23/2017 3:07:57 PM	3.113	mm/s
PINION NDE HEA1	1/23/2017 3:08:10 PM	0.699	gE
PINION NDE HEA2	1/23/2017 3:08:22 PM	0.221	gE
PINION NDE VV	1/23/2017 3:08:38 PM	1.892	mm/s
PINION NDE AV	1/23/2017 3:09:22 PM	3.129	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	21	EQUIPMENT NAME	CLASSIFIER AIR SLIDE FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2915 RPM	2915 RPM	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	NA	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	10.1	4.8	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 4.8 mm/s recorded in the Motor bearings.

ANALYSIS:

- Vibrations reduced significantly all time lower range after execution of suggested corrective action at most of the locations but increased in vertical direction & still in ALERT range. Symptoms of inadequate structural rigidity observed in the system.

ACTION PLAN:

1. Vibropads to be checked for equal balanced tightening at all measurement locations. Improvement in base structure rigidity may decrease the vibration level further, Kept under trend monitoring.

Last Measurement Report

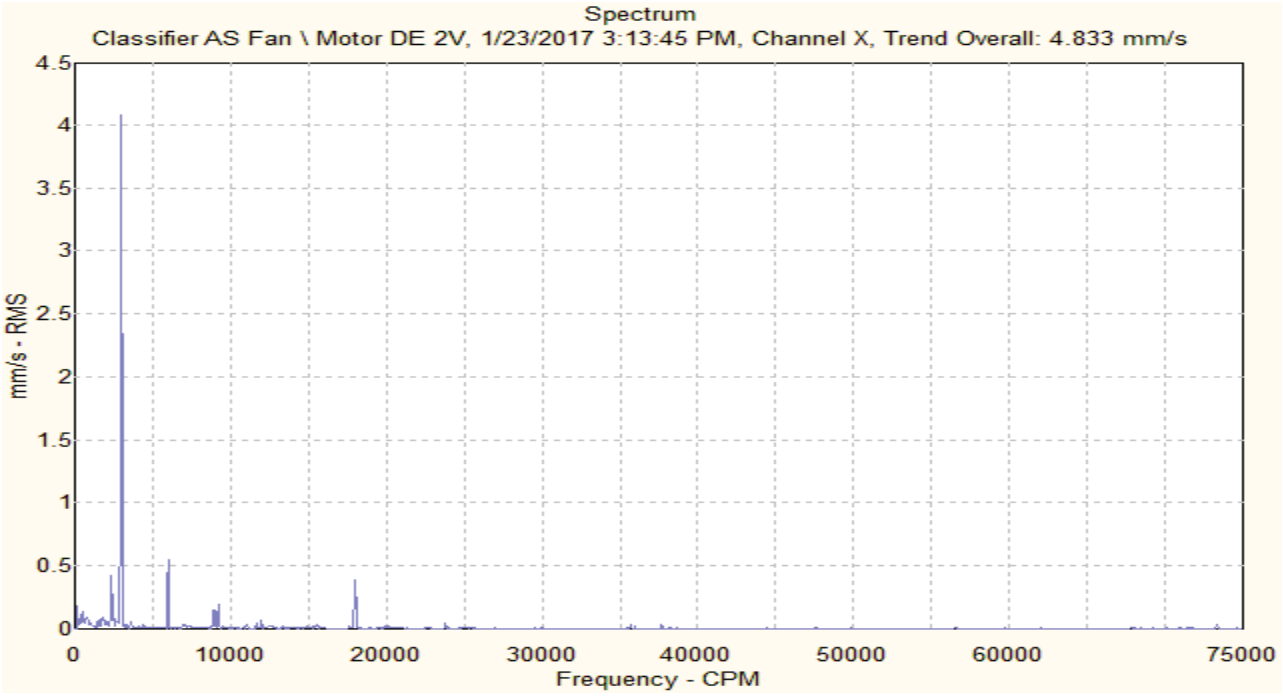
Source: Classifier AS Fan

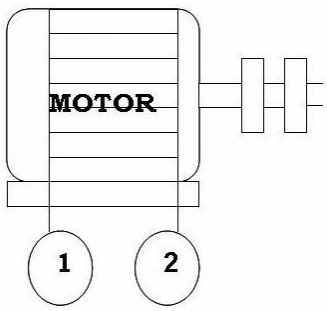
2/14/2017 4:02:56 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 9:47:22 AM	1.530	mm/s
Motor NDE 1HL	1/23/2017 9:47:30 AM	2.005	mm/s
Motor NDE HA	1/23/2017 9:47:33 AM	0.127	g
Motor NDE 1HgE3	1/23/2017 9:47:37 AM	0.340	gE
Motor NDE 1V	1/23/2017 3:14:02 PM	3.938	mm/s
Motor NDE 1A	1/23/2017 9:48:18 AM	0.919	mm/s
Motor DE 2H	1/23/2017 9:48:27 AM	1.714	mm/s
Motor DE HA	1/23/2017 9:48:30 AM	0.170	g
Motor DE 2HgE3	1/23/2017 9:48:34 AM	0.609	gE
Motor DE 2V	1/23/2017 3:13:45 PM	4.833	mm/s
Motor DE 2A	1/23/2017 9:49:19 AM	0.774	mm/s

Classifier AS Fan \ Motor DE 2V



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	22	EQUIPMENT NAME	CLASSIFIER SEAL AIR FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	4.5	4.5 to 11.2	Above 11.2

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	2800 RPM	2800 RPM	At Ground	Y
Power Rating	22 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6310 2Z C3 6210 2Z C3	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	6.1	5.5	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 5.5 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is just above ALERT as per ISO standards but vibrations trending higher from past few measurements indicating minor structural looseness induced vibrations.

ACTION PLAN:

1. Check foundation bolts for proper tightening and arrest slight looseness at base bolts, if any. Improvement in base structure rigidity may decrease the vibration level further, Kept under trend monitoring.

Last Measurement Report

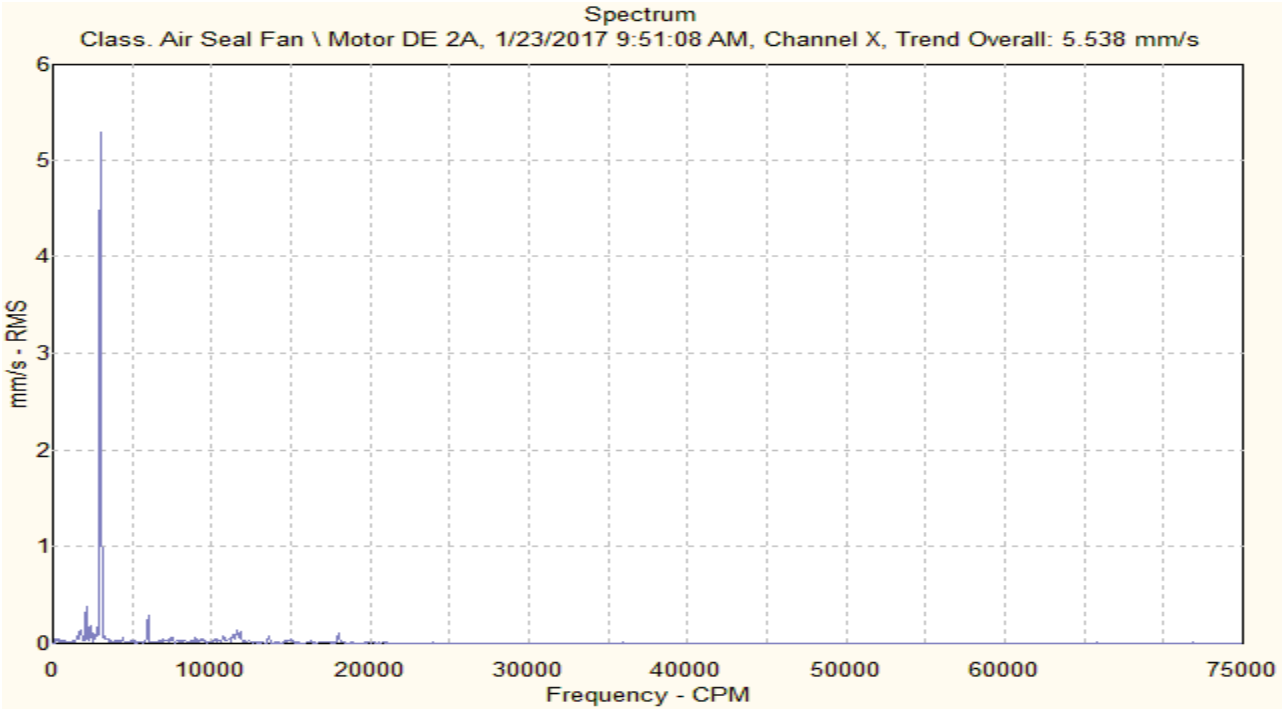
Source: Class. Air Seal Fan

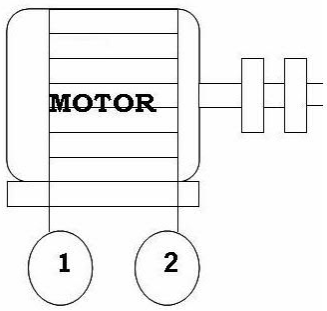
2/14/2017 4:03:41 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 9:49:49 AM	2.092	mm/s
Motor NDE 1HL	1/23/2017 9:49:57 AM	2.043	mm/s
Motor NDE HA	1/23/2017 9:49:59 AM	0.267	g
Motor NDE 1HgE3	1/23/2017 9:50:03 AM	0.949	gE
Motor NDE 1V	1/23/2017 9:50:18 AM	1.403	mm/s
Motor NDE 1A	1/23/2017 9:50:31 AM	4.958	mm/s
Motor DE 2H	1/23/2017 9:50:40 AM	1.988	mm/s
Motor DE HA	1/23/2017 9:50:42 AM	0.156	g
Motor DE 2HgE3	1/23/2017 9:50:46 AM	1.993	gE
Motor DE 2V	1/23/2017 9:50:56 AM	1.551	mm/s
Motor DE 2A	1/23/2017 9:51:08 AM	5.538	mm/s

Class. Air Seal Fan \ Motor DE 2A



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	23	EQUIPMENT NAME	SILO NO.1 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	6.1	6.0	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.0 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards with slight increment in vibration trend.

ACTION PLAN:

1. Ok to run under trend monitoring following routine coating cleaning.

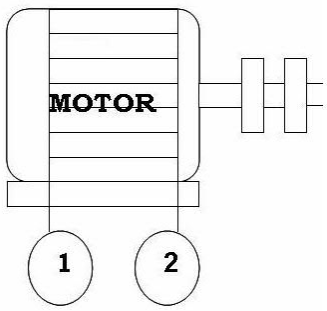
Last Measurement Report

Source: Silo No1 Binvent Fan

2/14/2017 4:04:17 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:08:02 AM	6.045	mm/s
Motor NDE 1HL	1/23/2017 10:08:10 AM	5.802	mm/s
Motor NDE HA	1/23/2017 10:08:12 AM	0.176	g
Motor NDE 1HgE3	1/23/2017 10:08:17 AM	0.523	gE
Motor NDE 1V	1/23/2017 10:08:26 AM	1.895	mm/s
Motor NDE 1A	1/23/2017 10:08:37 AM	3.854	mm/s
Motor DE 2H	1/23/2017 10:08:50 AM	4.218	mm/s
Motor DE HA	1/23/2017 10:08:52 AM	0.199	g
Motor DE 2HgE3	1/23/2017 10:08:56 AM	0.493	gE
Motor DE 2V	1/23/2017 10:09:08 AM	2.275	mm/s
Motor DE 2A	1/23/2017 10:09:20 AM	4.106	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	24	EQUIPMENT NAME	SILO NO.2 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	34.3	24.8	ALARM

OBSERVATIONS:

This equipment is indicating an "ALARM" behavior with maximum vibration amplitudes of 24.8 mm/s recorded in the Motor bearings.

ANALYSIS:

- Vibrations reduced significantly after partial execution of suggested corrective action at most of the locations but still higher as per the previous history and in ALARM range.
- Symptoms of considerable unbalance indicated at fan impeller.

ACTION PLAN:

1. It is suggested to clean coating accumulated on fan impeller as per schedule, Meanwhile it is suggested to perform dynamic balancing of fan impeller on next available opportunity to reduce the vibration level further.

Last Measurement Report

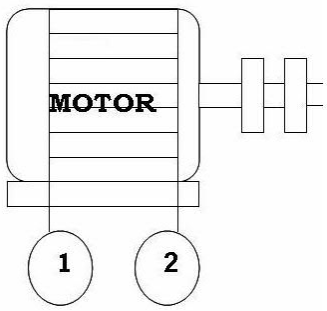
Source: Silo No2 Binvent Fan

2/14/2017 4:04:42 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:06:06 AM	5.389	mm/s
Motor NDE 1HL	1/23/2017 10:06:14 AM	4.562	mm/s
Motor NDE HA	1/23/2017 10:06:16 AM	0.193	g
Motor NDE 1HgE3	1/23/2017 10:06:20 AM	0.515	gE
Motor NDE 1V	1/23/2017 10:06:39 AM	7.652	mm/s
Motor NDE 1A	1/23/2017 10:06:50 AM	17.523	mm/s
Motor DE 2H	1/23/2017 10:07:11 AM	3.151	mm/s
Motor DE HA	1/23/2017 10:07:13 AM	0.143	g
Motor DE 2HgE3	1/23/2017 10:07:17 AM	0.401	gE
Motor DE 2V	1/23/2017 10:07:31 AM	6.328	mm/s
Motor DE 2A	1/23/2017 10:07:44 AM	24.827	mm/s

Silo No2 Binvent Fan \ Motor DE 2A

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	25	EQUIPMENT NAME	SILO NO.3 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	17.9	8.6	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 8.6 mm/s recorded in the Motor bearings.

ANALYSIS:

- Although vibrations reduced significantly as per the previous history but still in ALERT range.
- Symptoms of considerable unbalance indicated at fan impeller.

ACTION PLAN:

1. It is suggested to clean coating accumulated on fan impeller on priority basis.
2. Also ensure the frame bolt's length is optimum to provide rigidity to the system.

Last Measurement Report

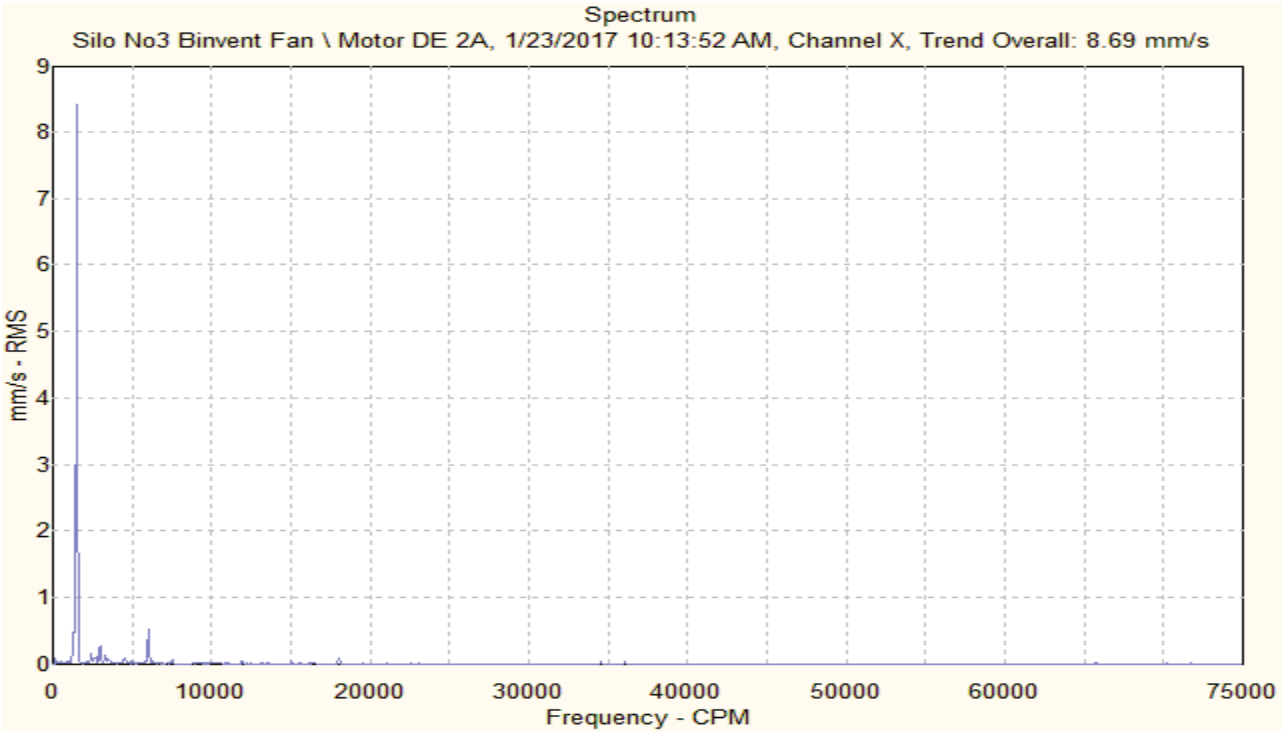
Source: Silo No3 Binvent Fan

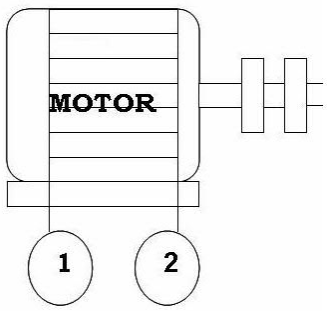
2/14/2017 4:05:20 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:12:35 AM	3.160	mm/s
Motor NDE 1HL	1/23/2017 10:12:43 AM	2.926	mm/s
Motor NDE HA	1/23/2017 10:12:46 AM	0.141	g
Motor NDE 1HgE3	1/23/2017 10:12:50 AM	1.484	gE
Motor NDE 1V	1/23/2017 10:13:01 AM	3.572	mm/s
Motor NDE 1A	1/23/2017 10:13:11 AM	8.076	mm/s
Motor DE 2H	1/23/2017 10:13:22 AM	4.802	mm/s
Motor DE HA	1/23/2017 10:13:24 AM	0.146	g
Motor DE 2HgE3	1/23/2017 10:13:28 AM	0.781	gE
Motor DE 2V	1/23/2017 10:13:39 AM	1.144	mm/s
Motor DE 2A	1/23/2017 10:13:52 AM	8.690	mm/s

Silo No3 Binvent Fan \ Motor DE 2A



Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	26	EQUIPMENT NAME	SILO NO.4 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (14.11.2016)	
MOTOR	2.7	2.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 2.7 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards.

ACTION PLAN:

1. Ok to run under trend monitoring.

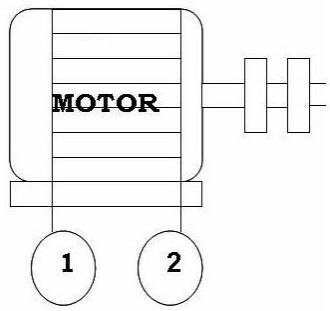
Last Measurement Report

Source: Silo No4 Binvent Fan

2/14/2017 4:06:00 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:09:57 AM	1.833	mm/s
Motor NDE 1HL	1/23/2017 10:10:05 AM	1.613	mm/s
Motor NDE HA	1/23/2017 10:10:07 AM	0.121	g
Motor NDE 1HgE3	1/23/2017 10:10:11 AM	0.285	gE
Motor NDE 1V	1/23/2017 10:10:26 AM	1.533	mm/s
Motor NDE 1A	1/23/2017 10:10:36 AM	2.740	mm/s
Motor DE 2H	1/23/2017 10:11:02 AM	1.025	mm/s
Motor DE HA	1/23/2017 10:11:04 AM	0.117	g
Motor DE 2HgE3	1/23/2017 10:11:08 AM	0.327	gE
Motor DE 2V	1/23/2017 10:11:51 AM	2.020	mm/s
Motor DE 2A	1/23/2017 10:12:15 AM	2.621	mm/s

Vibration Analysis Report 23.01.2017		RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	27	EQUIPMENT NAME	SILO NO.5 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (17.112016)	
MOTOR	3.1	4.3	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.3 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards.

ACTION PLAN:

1. Ok to run under trend monitoring following routine coating cleaning.

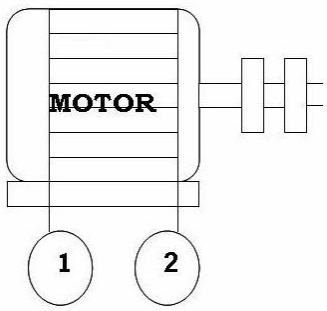
Last Measurement Report

Source: Silo No5 Binvent Fan

2/14/2017 4:06:23 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:14:53 AM	2.526	mm/s
Motor NDE 1HL	1/23/2017 10:15:01 AM	1.899	mm/s
Motor NDE HA	1/23/2017 10:15:04 AM	0.083	g
Motor NDE 1HgE3	1/23/2017 10:15:08 AM	0.370	gE
Motor NDE 1V	1/23/2017 10:15:20 AM	2.367	mm/s
Motor NDE 1A	1/23/2017 10:15:31 AM	4.056	mm/s
Motor DE 2H	1/23/2017 10:15:42 AM	2.828	mm/s
Motor DE HA	1/23/2017 10:15:45 AM	0.097	g
Motor DE 2HgE3	1/23/2017 10:15:49 AM	0.278	gE
Motor DE 2V	1/23/2017 10:15:59 AM	2.830	mm/s
Motor DE 2A	1/23/2017 10:16:27 AM	4.309	mm/s

Vibration Analysis Report 23.01.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	28	EQUIPMENT NAME	SILO NO.6 BINVENT FAN
MACHINE SKETCH			

Vibration Limits for this equipment – Velocity in mm/sec (rms)			
POSITION	NORMAL	ALERT	ALARM
MOTOR / FAN	7.1	7.1 to 18.0	Above 18.0

EQUIPMENT SPECIFICATIONS				
DESCRIPTION	DRIVE	DRIVEN	MOUNTING	Y/N
Rated Speed	1400 RPM	NA	At Ground	Y
Power Rating	5.5 KW	NA	On Rigid Concrete	N
Bearing No. (DE/NDE)	6208 ZZ 6207 ZZ	NA	Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia	NA	NA	On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (17.11.2016)	Present (23.01.2017)	
MOTOR	3.0	4.4	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.4 mm/s recorded in the Motor bearings.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards.

ACTION PLAN:

1. Ok to run under trend monitoring following routine coating cleaning.

Last Measurement Report

Source: Silo No6 Binvent Fan

2/14/2017 4:06:43 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	1/23/2017 10:17:46 AM	1.085	mm/s
Motor NDE 1HL	1/23/2017 10:17:53 AM	1.127	mm/s
Motor NDE HA	1/23/2017 10:17:56 AM	0.089	g
Motor NDE 1HgE3	1/23/2017 10:18:00 AM	0.317	gE
Motor NDE 1V	1/23/2017 10:18:09 AM	1.292	mm/s
Motor NDE 1A	1/23/2017 10:18:21 AM	2.629	mm/s
Motor DE 2H	1/23/2017 10:18:30 AM	1.165	mm/s
Motor DE HA	1/23/2017 10:18:32 AM	0.100	g
Motor DE 2HgE3	1/23/2017 10:18:36 AM	0.307	gE
Motor DE 2V	1/23/2017 10:19:05 AM	2.611	mm/s
Motor DE 2A	1/23/2017 10:19:24 AM	4.478	mm/s

IV. CONCLUSION

During the visit of our engineers to your site, on **23.01.2017**, detailed vibration measurement and analysis was carried out on the following machines. The health condition of equipment is classified below.

MACHINE CLASSIFIED UNDER ALARM CATEGORY

S.NO	EQUIPMENT NAME
1	UN-COATING FUGITIVE FAN
2	SILO-2 BINVENT FAN

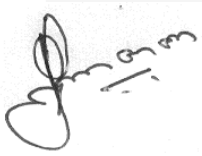
MACHINE CLASSIFIED UNDER ALERT CATEGORY

S.NO	EQUIPMENT NAME
1	GENERAL DC FAN
2	COATING CIRCUIT BOOSTER FAN
3	COATING CIRCUIT MAIN AIR FAN
4	COATING FUGITIVE FAN
5	BLENDER – DOOR SIDE
6	BALL MILL DISCHARGE BUCKET ELEVATOR
7	CLASSIFIER AIR SLIDE FAN
8	SEAL AIR FAN
9	SILO-3 BINVENT FAN

MACHINE CLASSIFIED UNDER NORMAL CATEGORY

S.NO	EQUIPMENT NAME
1	HAMMER MILL DC FAN
2	SELOX MAIN AIR FAN
3	UNCOATED TRANSFER BLOWER
4	COATED TRANSFER BLOWER
5	BALL MILL
6	HAMMER MILL RIGHT (DRIVE#1)
7	HAMMER MILL LEFT (DRIVE#2)

8	CLASSIFIER
9	DE-AGGLOMERATOR
10	BLENDER – HOUSING SIDE
11	BLENDER AERATION BLOWER
12	PRODUCT SILO AERATION BLOWER
13	SILO FEED BUCKET ELEVATOR
14	SILO-1 BINVENT FAN
15	SILO-4 BINVENT FAN
16	SILO-5 BINVENT FAN
17	SILO-6 BINVENT FAN



for SKF India Limited