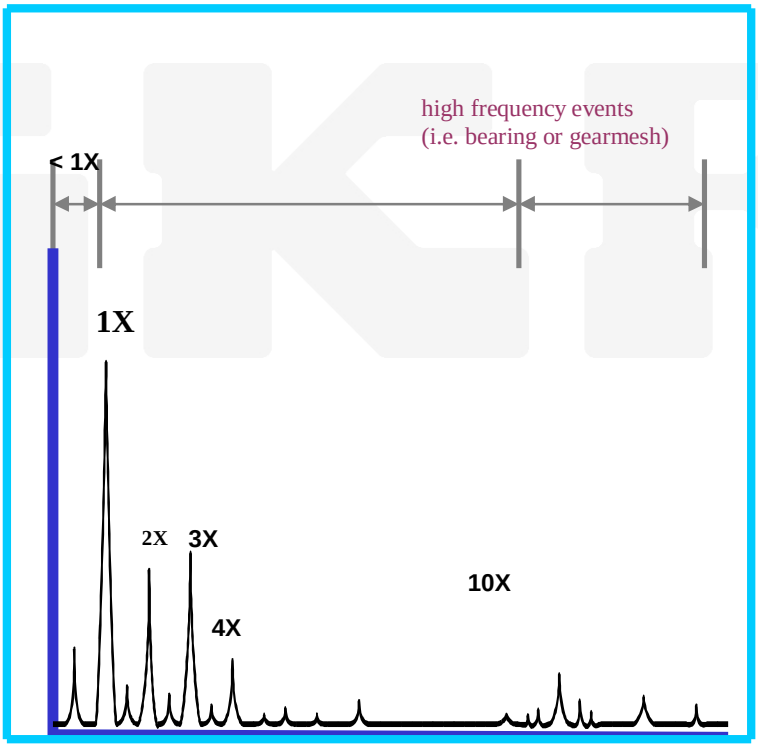
PREDICTIVE MAINTENANCE REPORT

Customer Name :

Site :

Date of Visit : 07th June 2017

Report No. : PDM/ARC/VA/067/17



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.

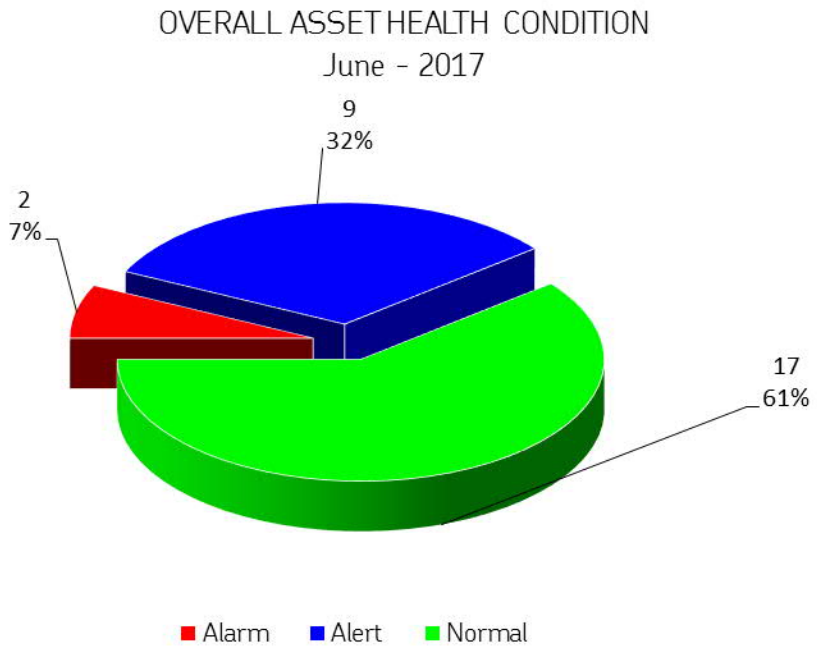
Visited & Analysed by : **Mr. Vaibhav Jain**

Microlog Model : **CMXA 70**

Microlog Sl.No. **100473**

Calibration Due : **March-2018**

During the visit of our Engineer to your plant on **07.06.2017**, 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	NORMAL	08 – 09
3	COATING CIRCUIT BOOSTER FAN	ALERT	10 – 12
4	COATING CIRCUIT MAIN AIR FAN	ALERT	13 -15
5	SELOX MAIN AIR FAN	NORMAL	16 – 17
6	COATING FUGITIVE FAN	ALERT	18 – 20
7	UN-COATING FUGITIVE FAN	ALERT	21 – 23
8	UNCOATED TRANSFER BLOWER	NORMAL	24 – 25
9	COATED TRANSFER BLOWER	NORMAL	26 – 27
10	BALL MILL	NORMAL	28 – 30

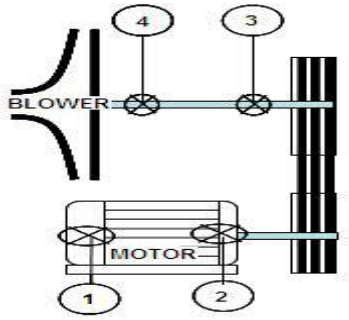
11	HAMMER MILL RIGHT (DRIVE#1)	ALERT	31 – 33
12	HAMMER MILL LEFT (DRIVE#2)	ALERT	34 – 36
13	CLASSIFIER	ALERT	37 – 39
14	DE-AGGLOMERATOR	ALERT	40 – 42
15	BLENDER – HOUSING SIDE	NORMAL	43 – 44
16	BLENDER – DOOR SIDE	NORMAL	45 – 46
17	BLENDER AERATION BLOWER	NORMAL	47 – 48
18	PRODUCT SILO AERATION BLOWER	NORMAL	49 – 50
19	BALL MILL DISCHARGE BUCKET ELEVATOR	NORMAL	51 – 53
20	SILO FEED BUCKET ELEVATOR	NORMAL	54 – 56
21	CLASSIFIER AIR SLIDE FAN	ALERT	57 – 58
22	SEAL AIR FAN	NORMAL	59 – 60
23	SILO-1 BINVENT FAN	NORMAL	61 – 62
24	SILO-2 BINVENT FAN	ALARM	63 – 64
25	SILO-3 BINVENT FAN	ALARM	65 – 66
26	SILO-4 BINVENT FAN	NORMAL	67 – 68
27	SILO-6 BINVENT FAN	NORMAL	69 – 70
28	COMPRESSOR - 1	NORMAL	71 – 72

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 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	3.9	3.9	NORMAL
BLOWER	3.5	3.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.9 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.

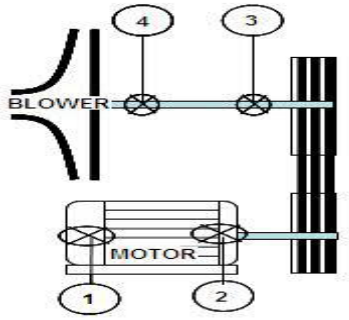
Last Measurement Report

Source: Hammer Mill DC Fan

6/9/2017 4:09:30 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:49:42 AM	1.895	mm/s
Motor NDE 1HL	6/7/2017 10:49:47 AM	1.885	mm/s
Motor NDE HA	6/7/2017 10:49:50 AM	0.343	g
Motor NDE 1HgE3	6/7/2017 10:49:54 AM	1.371	gE
Motor NDE 1V	6/7/2017 10:50:05 AM	3.352	mm/s
Motor NDE 1A	6/7/2017 10:50:15 AM	2.555	mm/s
Motor DE 2H	6/7/2017 10:50:24 AM	2.121	mm/s
Motor DE HA	6/7/2017 10:50:27 AM	0.450	g
Motor DE 2HgE3	6/7/2017 10:50:30 AM	6.074	gE
Motor DE 2V	6/7/2017 10:50:41 AM	3.909	mm/s
Motor DE 2A	6/7/2017 10:50:52 AM	2.169	mm/s
Fan DE 3HL-V	6/7/2017 10:51:07 AM	3.143	mm/s
Fan DE 3H	6/7/2017 10:51:10 AM	3.439	mm/s
Fan DE HA	6/7/2017 10:51:14 AM	0.604	g
Fan DE 3HgE3	6/7/2017 10:51:17 AM	7.425	gE
Fan DE 3V	6/7/2017 10:51:34 AM	3.771	mm/s
Fan DE 3A	6/7/2017 10:51:44 AM	2.445	mm/s
Fan NDE 4HL	6/7/2017 10:51:56 AM	2.553	mm/s
Fan NDE 4H	6/7/2017 10:51:59 AM	2.459	mm/s
Fan NDE HA	6/7/2017 10:52:03 AM	0.419	g
Fan NDE 4HgE3	6/7/2017 10:52:06 AM	3.009	gE
Fan NDE 4V	6/7/2017 10:52:16 AM	2.638	mm/s
Fan NDE 4A	6/7/2017 10:52:25 AM	2.149	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	5.4	6.7	NORMAL
BLOWER	6.2	6.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.7 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.

ACTION PLAN:

1. Ok to run under trend monitoring, Improvement in system rigidity may reduce vibrations further.
2. Check belt pulley assembly for proper alignment & clean coating accumulated on fan impeller as per schedule.

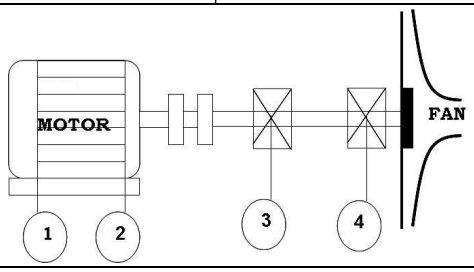
Last Measurement Report

Source: General DC Fan

6/9/2017 4:10:12 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:05:31 AM	3.599	mm/s
Motor NDE 1HL	6/7/2017 11:05:36 AM	3.688	mm/s
Motor NDE HA	6/7/2017 11:05:39 AM	0.305	g
Motor NDE 1HgE3	6/7/2017 11:05:43 AM	2.027	gE
Motor NDE 1V	6/7/2017 11:06:19 AM	6.744	mm/s
Motor NDE 1A	6/7/2017 11:06:31 AM	4.418	mm/s
Motor DE 2H	6/7/2017 11:06:39 AM	2.518	mm/s
Motor DE HA	6/7/2017 11:06:42 AM	0.376	g
Motor DE 2HgE3	6/7/2017 11:06:46 AM	2.143	gE
Motor DE 2V	6/7/2017 11:06:58 AM	5.845	mm/s
Motor DE 2A	6/7/2017 11:07:07 AM	4.446	mm/s
Fan DE 3H	6/7/2017 11:07:23 AM	6.710	mm/s
Fan DE HA	6/7/2017 11:07:27 AM	1.315	g
Fan DE 3HgE3	6/7/2017 11:07:30 AM	15.351	gE
Fan DE 3V	6/7/2017 11:07:41 AM	5.818	mm/s
Fan DE 3A	6/7/2017 11:07:50 AM	5.309	mm/s
Fan NDE 4HL	6/7/2017 11:07:59 AM	4.620	mm/s
Fan NDE 4H	6/7/2017 11:08:03 AM	5.510	mm/s
Fan NDE HA	6/7/2017 11:08:07 AM	1.192	g
Fan NDE 4HgE3	6/7/2017 11:08:10 AM	10.735	gE
Fan NDE 4V	6/7/2017 11:08:20 AM	4.202	mm/s
Fan NDE 4A	6/7/2017 11:08:30 AM	4.559	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.6	3.1	NORMAL
BLOWER	4.0	8.6	ALERT

OBSERVATIONS:

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

ANALYSIS:

- Overall health condition of the equipment increased to ALERT condition with indications of temporary unbalance & minor structural looseness.

ACTION PLAN:

1. It is suggested to clean coating accumulated on fan impeller on priority basis.
2. Also ensure proper functioning of vibro pads & reset the tension specifically at fan end.

Last Measurement Report

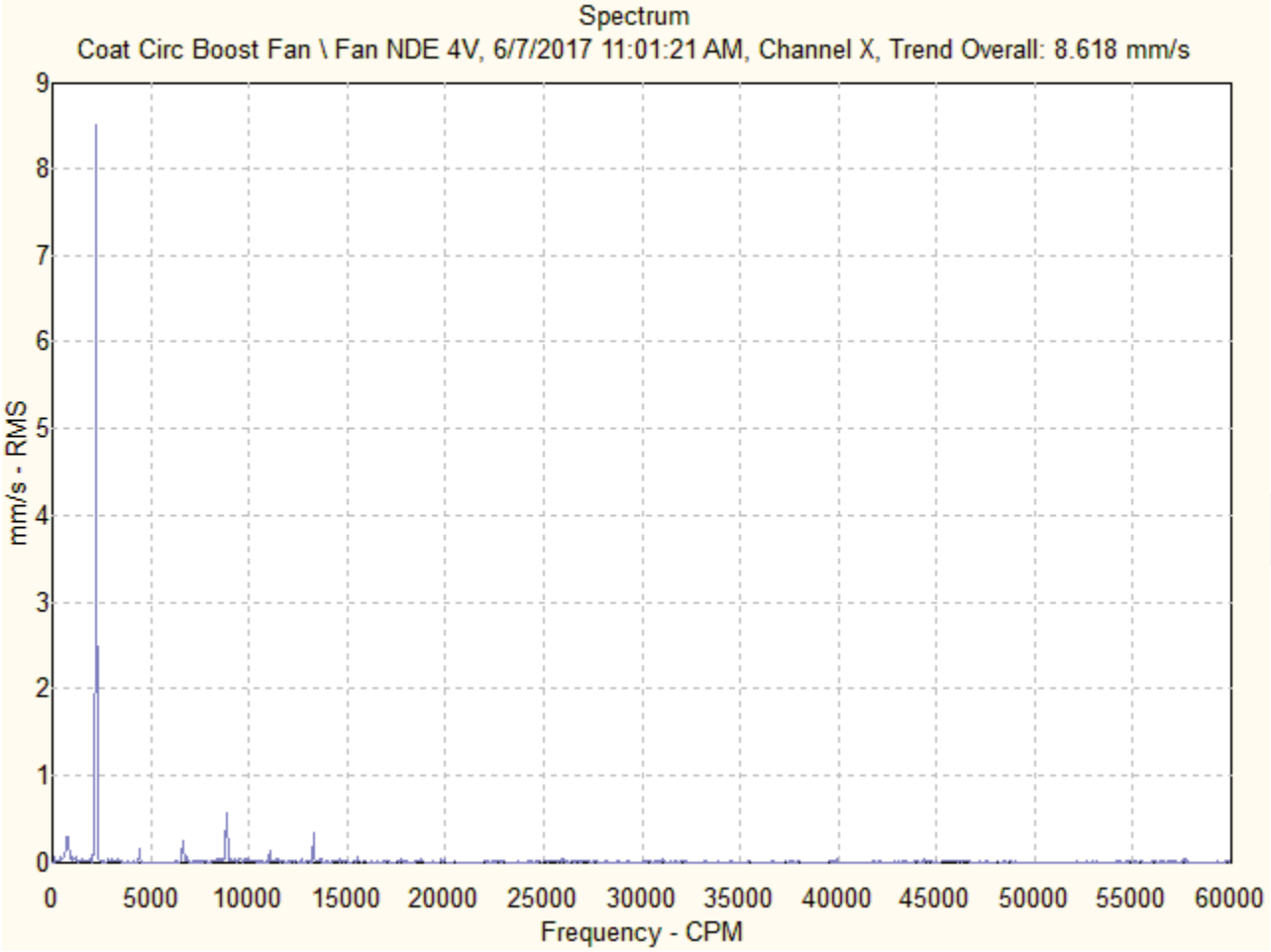
Source: Coat Circ Boost Fan

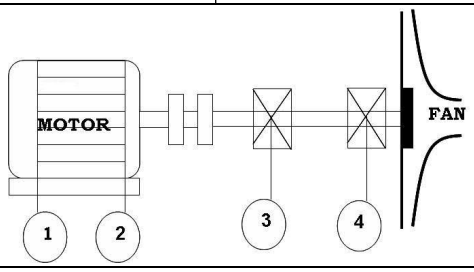
6/9/2017 4:10:40 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:58:16 AM	1.036	mm/s
Motor NDE 1HL	6/7/2017 10:58:20 AM	0.944	mm/s
Motor NDE HA	6/7/2017 10:58:24 AM	0.271	g
Motor NDE 1HgE3	6/7/2017 10:58:27 AM	1.810	gE
Motor NDE 1V	6/7/2017 10:59:06 AM	2.786	mm/s
Motor NDE 1A	6/7/2017 10:58:52 AM	1.234	mm/s
Motor DE 2H	6/7/2017 10:59:20 AM	3.138	mm/s
Motor DE HA	6/7/2017 10:59:24 AM	0.304	g
Motor DE 2HgE3	6/7/2017 10:59:27 AM	2.647	gE
Motor DE 2V	6/7/2017 10:59:39 AM	1.762	mm/s
Motor DE 2A	6/7/2017 10:59:48 AM	1.060	mm/s
Fan DE 3HL-V	6/7/2017 11:00:00 AM	2.011	mm/s
Fan DE 3H	6/7/2017 11:00:03 AM	2.187	mm/s
Fan DE HA	6/7/2017 11:00:06 AM	0.473	g
Fan DE 3HgE3	6/7/2017 11:00:10 AM	4.939	gE
Fan DE 3V	6/7/2017 11:00:39 AM	5.415	mm/s
Fan DE 3A	6/7/2017 11:00:48 AM	1.993	mm/s
Fan NDE 4HL	6/7/2017 11:00:59 AM	4.756	mm/s
Fan NDE 4H	6/7/2017 11:01:02 AM	4.757	mm/s
Fan NDE HA	6/7/2017 11:01:06 AM	0.275	g
Fan NDE 4HgE3	6/7/2017 11:01:09 AM	1.924	gE
Fan NDE 4V	6/7/2017 11:01:21 AM	8.618	mm/s
Fan NDE 4A	6/7/2017 11:01:33 AM	1.318	mm/s

Coat Circ Boost Fan \ Fan NDE 4V



Vibration Analysis Report 07.06.2017		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 (22.02.2017)	Present (07.06.2017)	
MOTOR	5.1	5.0	ALERT
BLOWER	5.8	5.7	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 5.7 mm/s recorded in the Blower bearings.

ANALYSIS:

- Symptoms of structural / rotational looseness & considerable misalignment indicated in FFT spectrum.
- Minor unbalance indicated at fan impeller.

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 & review alignment between both the drives. Inspect the coupling condition for any abnormality or looseness. If the above found ok, plan for motor & fan DE bearings inspection for increased clearances or rotational looseness. Impeller to be cleaned for coating accumulated as per schedule.

Last Measurement Report

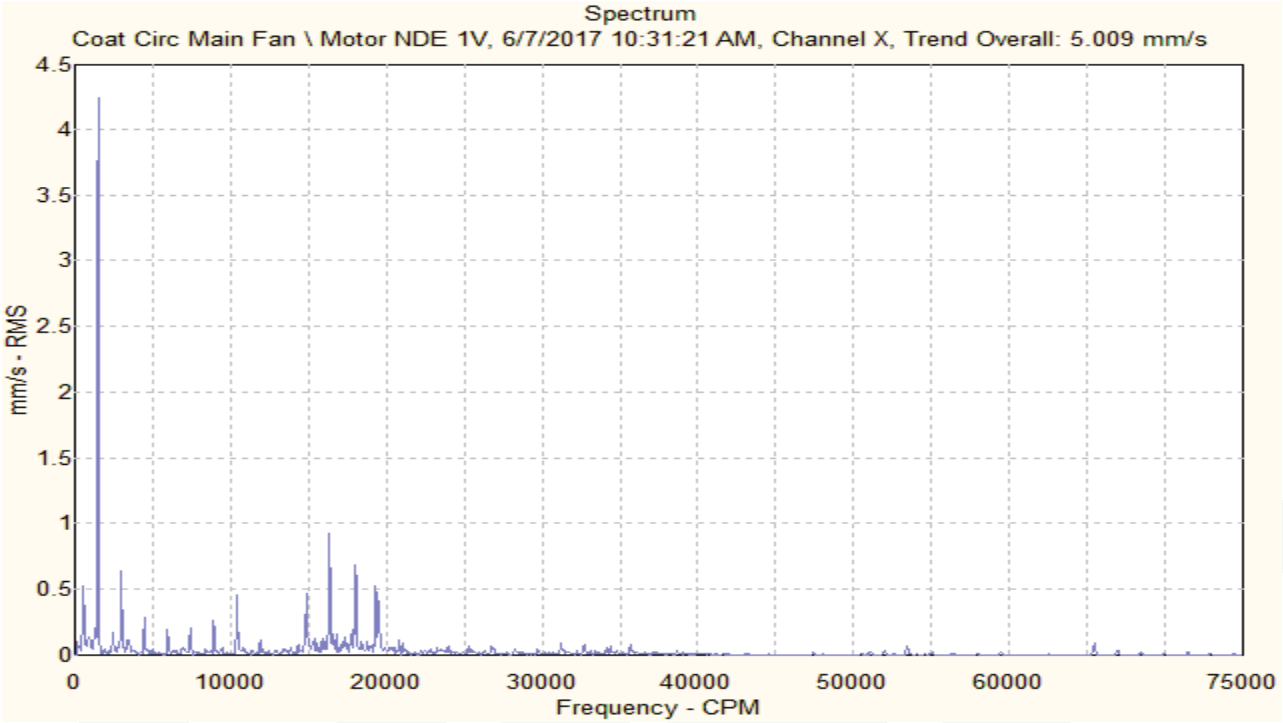
Source: Coat Circ Main Fan

6/9/2017 4:11:21 PM

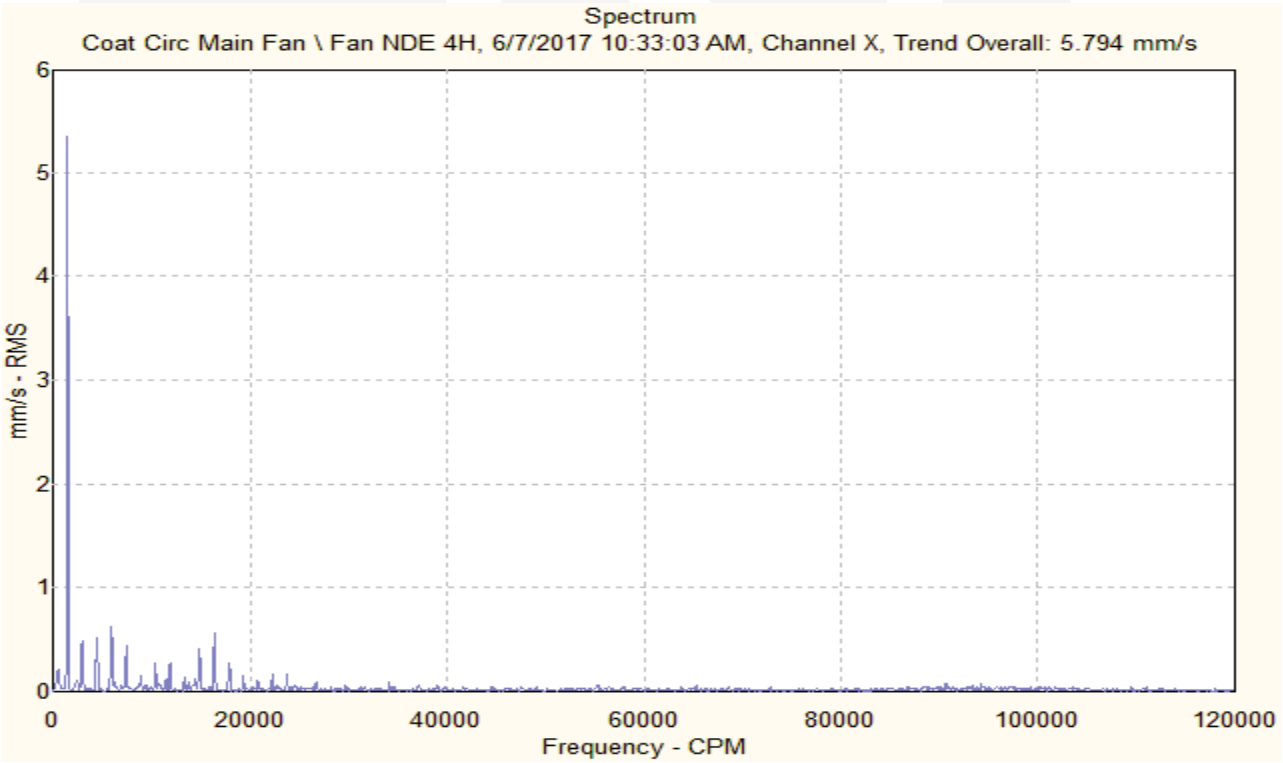
Last Measurement

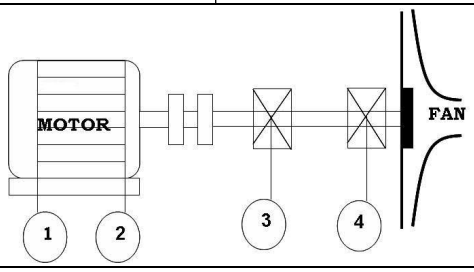
POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:31:00 AM	4.029	mm/s
Motor NDE 1HL	6/7/2017 10:31:05 AM	4.095	mm/s
Motor NDE HA	6/7/2017 10:31:08 AM	0.311	g
Motor NDE 1HgE3	6/7/2017 10:31:11 AM	0.931	gE
Motor NDE 1V	6/7/2017 10:31:21 AM	5.009	mm/s
Motor NDE 1A	6/7/2017 10:31:30 AM	3.123	mm/s
Motor DE 2H	6/7/2017 10:31:40 AM	4.536	mm/s
Motor DE HA	6/7/2017 10:31:43 AM	0.378	g
Motor DE 2HgE3	6/7/2017 10:31:47 AM	2.251	gE
Motor DE 2V	6/7/2017 10:31:58 AM	4.421	mm/s
Motor DE 2A	6/7/2017 10:32:08 AM	3.066	mm/s
Fan DE 3HL-V	6/7/2017 10:32:18 AM	3.651	mm/s
Fan DE 3H	6/7/2017 10:32:22 AM	3.366	mm/s
Fan DE HA	6/7/2017 10:32:25 AM	0.396	g
Fan DE 3HgE3	6/7/2017 10:32:28 AM	3.556	gE
Fan DE 3V	6/7/2017 10:32:40 AM	3.973	mm/s
Fan DE 3A	6/7/2017 10:32:49 AM	2.771	mm/s
Fan NDE 4HL	6/7/2017 10:33:00 AM	5.678	mm/s
Fan NDE 4H	6/7/2017 10:33:03 AM	5.794	mm/s
Fan NDE HA	6/7/2017 10:33:06 AM	0.561	g
Fan NDE 4HgE3	6/7/2017 10:33:10 AM	4.897	gE
Fan NDE 4V	6/7/2017 10:33:20 AM	5.616	mm/s
Fan NDE 4A	6/7/2017 10:33:29 AM	2.408	mm/s

Coat Circ Main Fan \ Motor NDE 1V



Coat Circ Main Fan \ Fan NDE 4H



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	1.2	1.3	NORMAL
BLOWER	1.6	1.5	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 1.5 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.

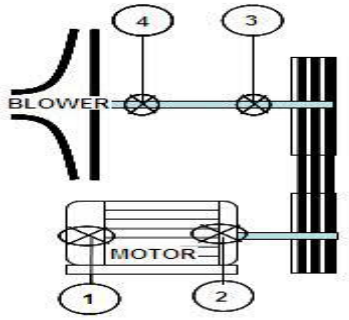
Last Measurement Report

Source: Selox Mainair Fan

6/9/2017 4:12:39 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 9:41:30 AM	1.358	mm/s
Motor NDE HA	6/7/2017 9:41:33 AM	0.556	g
Motor NDE 1HgE3	6/7/2017 9:41:36 AM	4.221	gE
Motor NDE 1V	6/7/2017 9:41:46 AM	1.171	mm/s
Motor NDE 1A	6/7/2017 9:42:11 AM	1.141	mm/s
Motor DE 2H	6/7/2017 9:42:22 AM	1.280	mm/s
Motor DE HA	6/7/2017 9:42:25 AM	0.470	g
Motor DE 2HgE3	6/7/2017 9:42:28 AM	4.686	gE
Motor DE 2V	6/7/2017 9:42:38 AM	1.346	mm/s
Motor DE 2A	6/7/2017 9:42:47 AM	1.248	mm/s
Fan DE 3HL-V	6/7/2017 9:42:59 AM	0.697	mm/s
Fan DE 3H	6/7/2017 9:43:05 AM	0.750	mm/s
Fan DE HA	6/7/2017 9:43:08 AM	0.205	g
Fan DE 3HgE3	6/7/2017 9:43:11 AM	1.204	gE
Fan DE 3V	6/7/2017 9:43:25 AM	0.643	mm/s
Fan DE 3A	6/7/2017 9:43:38 AM	1.010	mm/s
Fan NDE 4HL	6/7/2017 9:43:49 AM	0.934	mm/s
Fan NDE 4H	6/7/2017 9:43:55 AM	0.946	mm/s
Fan NDE HA	6/7/2017 9:43:58 AM	0.244	g
Fan NDE 4HgE3	6/7/2017 9:44:01 AM	2.642	gE
Fan NDE 4V	6/7/2017 9:44:17 AM	1.137	mm/s
Fan NDE 4A	6/7/2017 9:44:28 AM	1.574	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	9.8	8.2	ALERT
BLOWER	11.9	9.3	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 9.3 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

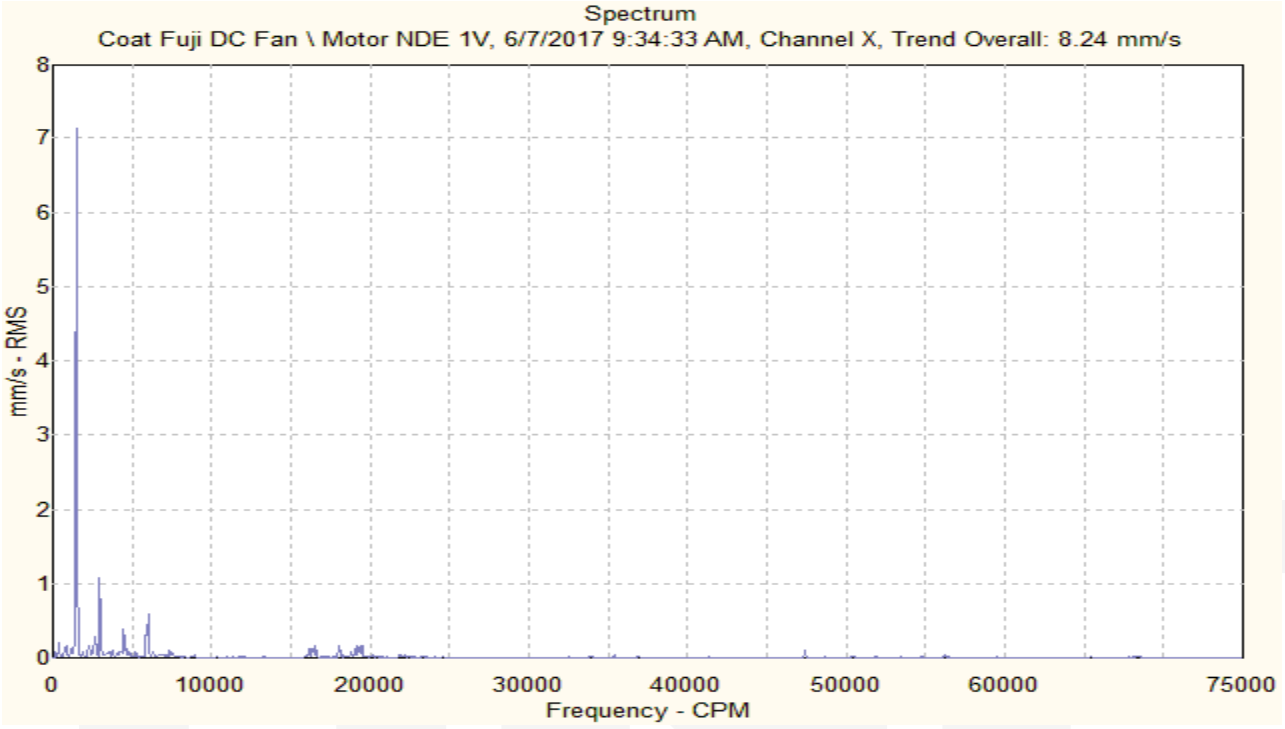
Source: Coat Fuji DC Fan

6/9/2017 4:13:04 PM

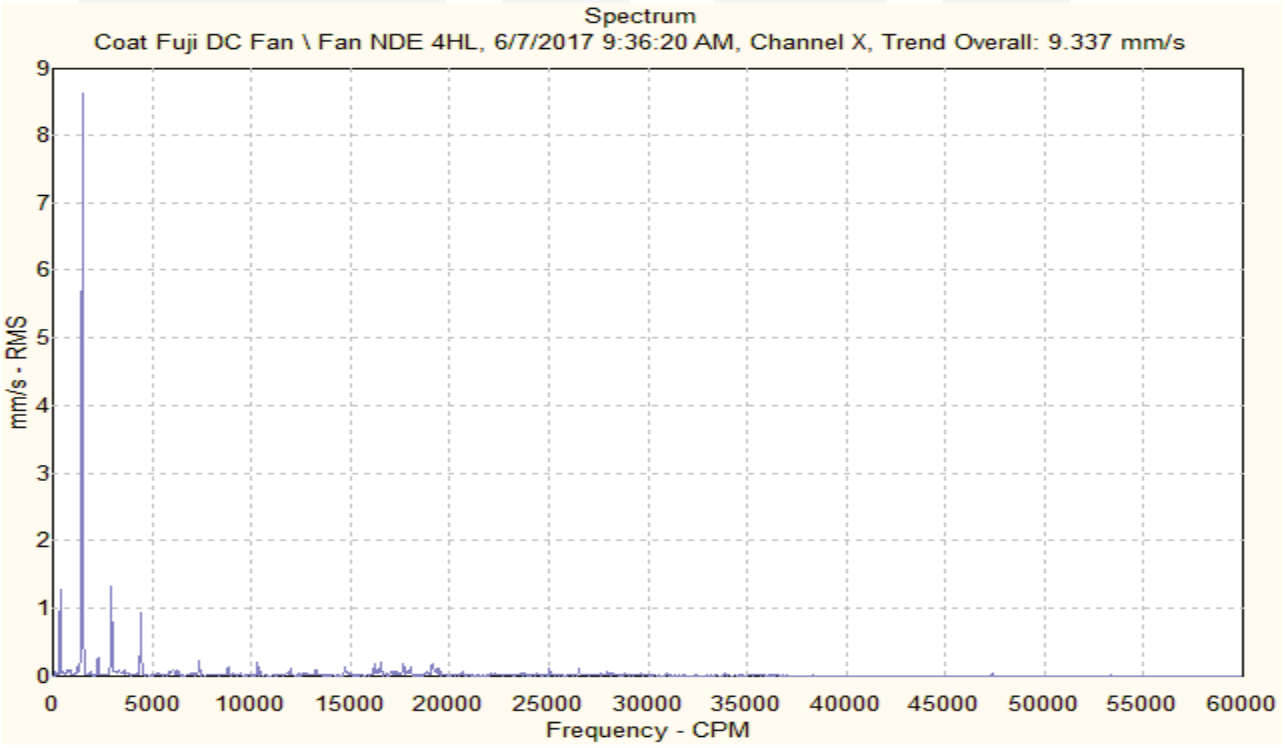
Last Measurement

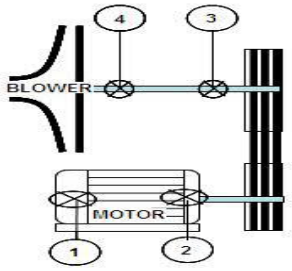
POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 9:34:11 AM	4.300	mm/s
Motor NDE 1HL	6/7/2017 9:34:16 AM	5.072	mm/s
Motor NDE HA	6/7/2017 9:34:19 AM	0.241	g
Motor NDE 1HgE3	6/7/2017 9:34:22 AM	1.433	gE
Motor NDE 1V	6/7/2017 9:34:33 AM	8.240	mm/s
Motor NDE 1A	6/7/2017 9:34:42 AM	4.342	mm/s
Motor DE 2H	6/7/2017 9:34:51 AM	6.301	mm/s
Motor DE HA	6/7/2017 9:34:54 AM	0.294	g
Motor DE 2HgE3	6/7/2017 9:34:57 AM	1.255	gE
Motor DE 2V	6/7/2017 9:35:09 AM	9.183	mm/s
Motor DE 2A	6/7/2017 9:35:18 AM	6.994	mm/s
Fan DE 3HL-V	6/7/2017 9:35:33 AM	7.595	mm/s
Fan DE 3H	6/7/2017 9:35:37 AM	9.375	mm/s
Fan DE HA	6/7/2017 9:35:40 AM	0.235	g
Fan DE 3HgE3	6/7/2017 9:35:43 AM	2.946	gE
Fan DE 3V	6/7/2017 9:35:54 AM	6.010	mm/s
Fan DE 3A	6/7/2017 9:36:05 AM	7.297	mm/s
Fan NDE 4HL	6/7/2017 9:36:20 AM	9.337	mm/s
Fan NDE 4H	6/7/2017 9:36:24 AM	8.186	mm/s
Fan NDE HA	6/7/2017 9:36:27 AM	0.236	g
Fan NDE 4HgE3	6/7/2017 9:36:30 AM	1.331	gE
Fan NDE 4V	6/7/2017 9:36:43 AM	7.532	mm/s
Fan NDE 4A	6/7/2017 9:36:55 AM	6.207	mm/s

Coat Fuji DC Fan \ Motor NDE 1V



Coat Fuji DC Fan \ Fan NDE 4HL



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	8.4	9.5	ALERT
BLOWER	7.2	8.4	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 9.5 mm/s recorded in the Motor 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

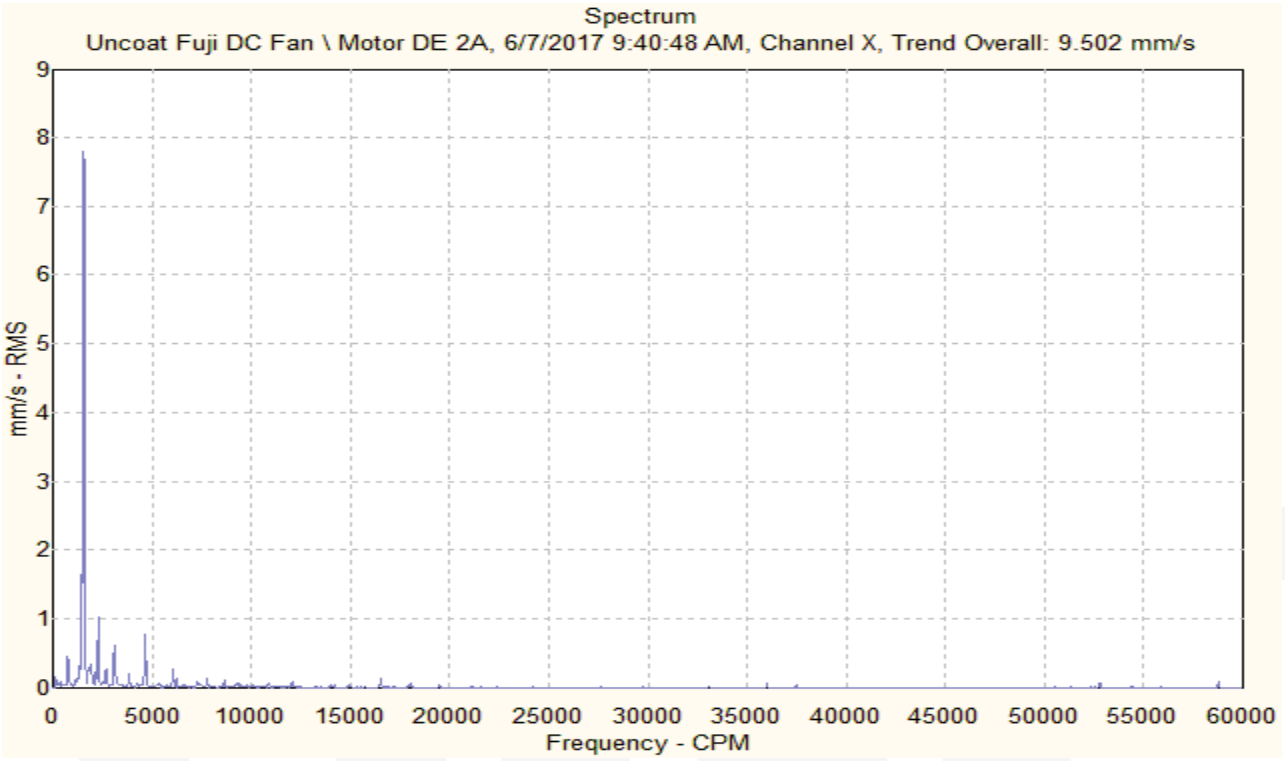
Source: Uncoat Fuji DC Fan

6/9/2017 4:14:26 PM

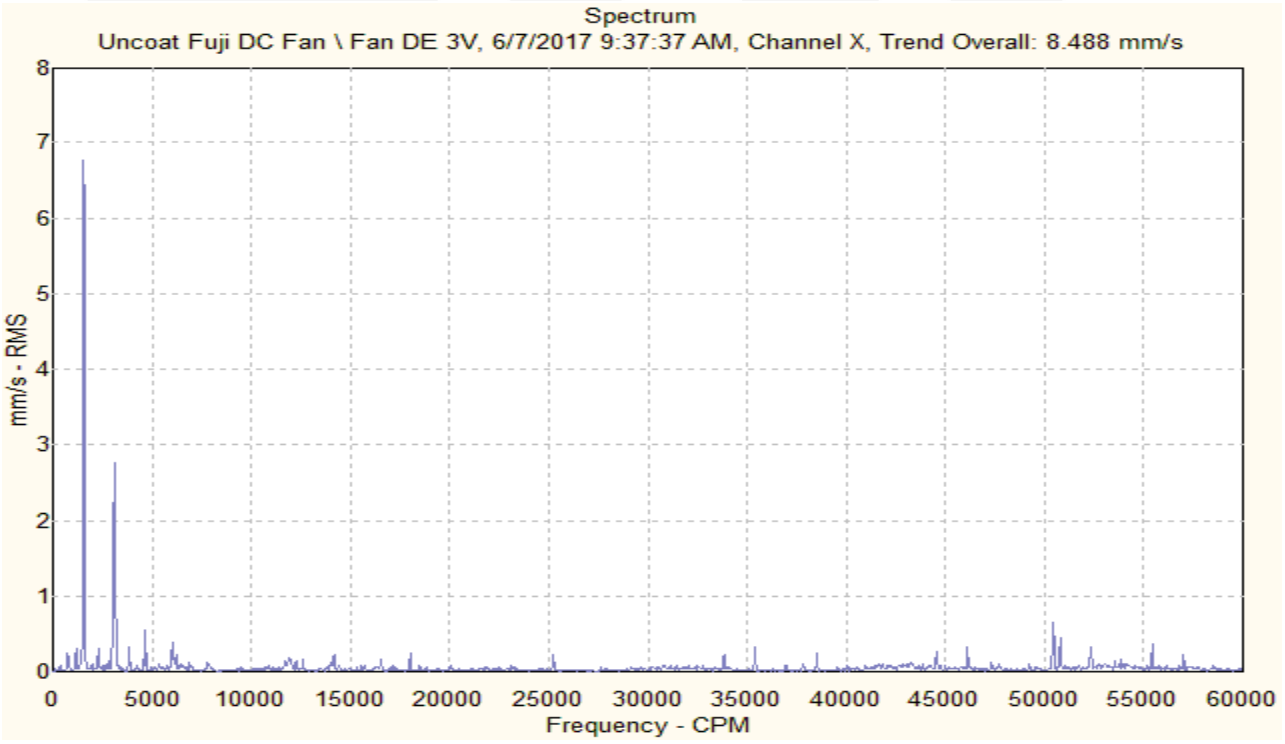
Last Measurement

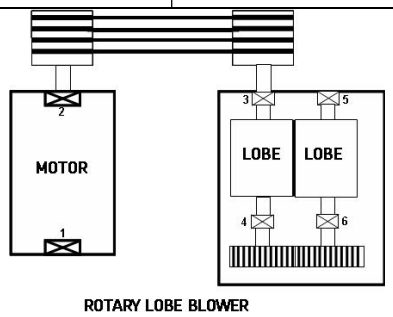
POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 9:39:14 AM	8.397	mm/s
Motor NDE 1HL	6/7/2017 9:39:18 AM	8.485	mm/s
Motor NDE HA	6/7/2017 9:39:21 AM	0.310	g
Motor NDE 1HgE3	6/7/2017 9:39:25 AM	1.615	gE
Motor NDE 1V	6/7/2017 9:39:35 AM	8.884	mm/s
Motor NDE 1A	6/7/2017 9:39:59 AM	9.431	mm/s
Motor DE 2H	6/7/2017 9:40:07 AM	7.586	mm/s
Motor DE HA	6/7/2017 9:40:10 AM	0.403	g
Motor DE 2HgE3	6/7/2017 9:40:14 AM	2.907	gE
Motor DE 2V	6/7/2017 9:40:25 AM	5.086	mm/s
Motor DE 2A	6/7/2017 9:40:48 AM	9.502	mm/s
Fan DE 3HL-V	6/7/2017 9:37:13 AM	7.158	mm/s
Fan DE 3H	6/7/2017 9:37:17 AM	5.715	mm/s
Fan DE HA	6/7/2017 9:37:20 AM	1.276	g
Fan DE HEA 1	6/7/2017 9:37:24 AM	14.389	gE
Fan DE 3V	6/7/2017 9:37:37 AM	8.488	mm/s
Fan DE 3A	6/7/2017 9:37:48 AM	3.294	mm/s
Fan NDE 4HL	6/7/2017 9:38:23 AM	4.165	mm/s
Fan NDE 4H	6/7/2017 9:38:26 AM	4.572	mm/s
Fan NDE HA	6/7/2017 9:38:29 AM	0.637	g
Fan NDE HEA1	6/7/2017 9:38:33 AM	7.965	gE
Fan NDE 4V	6/7/2017 9:38:45 AM	5.508	mm/s
Fan NDE 4A	6/7/2017 9:38:55 AM	2.820	mm/s

Uncoat Fuji DC Fan \ Motor DE 2A



Uncoat Fuji DC Fan \ Fan DE 3V



Vibration Analysis Report 07.06.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	8	EQUIPMENT NAME	UNCOATED 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	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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.7	2.4	NORMAL
BLOWER	4.4	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.

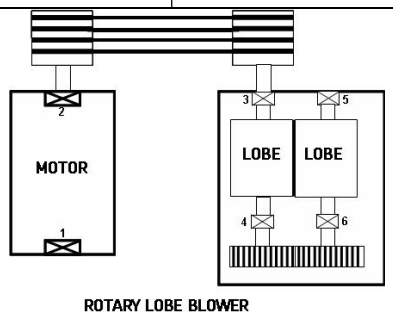
Last Measurement Report

Source: Uncoat Trans Blower

6/9/2017 4:15:55 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:26:28 AM	2.455	mm/s
Motor NDE HA	6/7/2017 11:26:31 AM	0.480	g
Motor NDE 1HgE3	6/7/2017 11:26:35 AM	1.852	gE
Motor NDE 1V	6/7/2017 11:26:44 AM	1.572	mm/s
Motor NDE 1A	6/7/2017 11:26:51 AM	1.739	mm/s
Motor DE 2H	6/7/2017 11:26:59 AM	2.676	mm/s
Motor DE HA	6/7/2017 11:27:02 AM	0.351	g
Motor DE 2HgE3	6/7/2017 11:27:06 AM	5.175	gE
Motor DE 2V	6/7/2017 11:27:15 AM	1.902	mm/s
Motor DE 2A	6/7/2017 11:27:25 AM	1.865	mm/s
Fan DE 3H	6/7/2017 11:27:33 AM	3.507	mm/s
Fan DE HA	6/7/2017 11:27:36 AM	0.695	g
Fan DE 3HgE3	6/7/2017 11:27:40 AM	7.644	gE
Fan DE 3V	6/7/2017 11:27:52 AM	3.847	mm/s
Fan DE 3A	6/7/2017 11:28:02 AM	2.929	mm/s
Fan NDE 4H	6/7/2017 11:28:11 AM	3.378	mm/s
Fan NDE HA	6/7/2017 11:28:14 AM	0.867	g
Fan NDE 4HgE3	6/7/2017 11:28:18 AM	10.388	gE
Fan NDE 4V	6/7/2017 11:28:30 AM	3.670	mm/s
Fan NDE 4A	6/7/2017 11:28:39 AM	2.988	mm/s
Point 5 HV	6/7/2017 11:28:51 AM	3.765	mm/s
Point 5 HEA	6/7/2017 11:28:54 AM	12.072	gE
Point 5 VV	6/7/2017 11:29:05 AM	4.754	mm/s
Point 5 AV	6/7/2017 11:29:14 AM	4.476	mm/s
Point 6 HV	6/7/2017 11:29:24 AM	4.030	mm/s
Point 6 HEA	6/7/2017 11:29:30 AM	15.163	gE
Point 6 VV	6/7/2017 11:29:40 AM	4.076	mm/s
Point 6 AV	6/7/2017 11:29:51 AM	4.942	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	4.3	4.9	NORMAL
BLOWER	4.7	4.3	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.9 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:

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

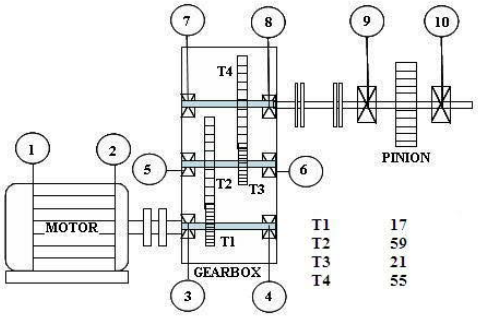
Last Measurement Report

Source: Coat. Trans Blower

6/9/2017 4:16:41 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:25:15 AM	3.781	mm/s
Motor NDE 1HL	6/7/2017 11:25:20 AM	3.993	mm/s
Motor NDE HA	6/7/2017 11:25:23 AM	0.255	g
Motor NDE 1HgE3	6/7/2017 11:25:27 AM	2.271	gE
Motor NDE 1V	6/7/2017 11:25:39 AM	3.670	mm/s
Motor NDE 1A	6/7/2017 11:25:50 AM	3.578	mm/s
Motor DE 2H	6/7/2017 11:25:58 AM	3.887	mm/s
Motor DE HA	6/7/2017 11:26:02 AM	0.513	g
Motor DE 2HgE3	6/7/2017 11:26:05 AM	2.037	gE
Motor DE 2V	6/7/2017 11:30:06 AM	2.642	mm/s
Motor DE 2A	6/7/2017 11:30:14 AM	4.989	mm/s
Fan DE 3H	6/7/2017 11:30:22 AM	4.205	mm/s
Fan DE HA	6/7/2017 11:30:25 AM	0.823	g
Fan DE 3HgE3	6/7/2017 11:30:29 AM	7.773	gE
Fan DE 3V	6/7/2017 11:30:40 AM	3.218	mm/s
Fan DE 3A	6/7/2017 11:30:49 AM	3.663	mm/s
Fan NDE 4H	6/7/2017 11:31:00 AM	4.389	mm/s
Fan NDE 4V	6/7/2017 11:31:13 AM	2.604	mm/s
Fan NDE HA	6/7/2017 11:31:21 AM	1.147	g
Fan NDE 4HgE3	6/7/2017 11:31:25 AM	9.238	gE
Fan NDE 4A	6/7/2017 11:31:35 AM	3.781	mm/s
Point 5 HV	6/7/2017 11:31:46 AM	3.929	mm/s
Point 5 HEA	6/7/2017 11:31:50 AM	9.054	gE
Point 5 VV	6/7/2017 11:32:02 AM	3.056	mm/s
Point 5 AV	6/7/2017 11:32:11 AM	4.549	mm/s
Point 6 HV	6/7/2017 11:32:22 AM	4.098	mm/s
Point 6 HEA	6/7/2017 11:32:27 AM	6.531	gE
Point 6 VV	6/7/2017 11:32:40 AM	3.161	mm/s
Point 6 AV	6/7/2017 11:32:51 AM	4.511	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.0	1.9	NORMAL
GEARBOX	3.2	4.3	NORMAL
PINION	3.7	4.2	NORMAL

OBSERVATIONS:

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

ANALYSIS:

- Vibrations are stable almost at all the measurement locations.
- But increased at gearbox input bearings indicating symptoms of minor misalignment between drive & gearbox and improper tooth loading at intermediate shaft's gear.

ACTION PLAN:

1. Plan for review alignment between motor & gear box on next available opportunity.
2. Amplitude of GMFs are in trend at gearbox intermediate shaft. Second order GMF is dominating the FFT spectra. It is suggested to keep close monitoring over any abnormal behavior of equipment.

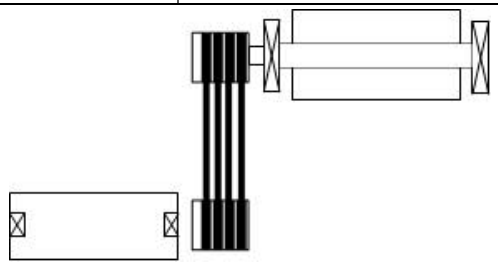
Last Measurement Report

Source: BALL MILL

6/9/2017 4:17:16 PM

POINT name	Last Measurement Date/Time	Last value	Units
MOTOR NDE HV	6/7/2017 9:57:39 AM	1.315	mm/s
MOTOR NDE HV.1	6/7/2017 9:57:42 AM	1.160	mm/s
MOTOR NDE HA	6/7/2017 9:57:45 AM	0.352	g
MOTOR NDE HEA 1	6/7/2017 9:57:49 AM	1.107	gE
MOTOR NDE HEA 2	6/7/2017 9:57:52 AM	4.633	gE
MOTOR NDE VV	6/7/2017 9:58:03 AM	1.808	mm/s
MOTOR NDE AV	6/7/2017 9:58:12 AM	0.956	mm/s
MOTOR DE HV	6/7/2017 9:58:25 AM	1.720	mm/s
MOTOR DE HV.1	6/7/2017 9:58:28 AM	1.707	mm/s
MOTOR DE HA	6/7/2017 9:58:32 AM	0.382	g
MOTOR DE HEA 1	6/7/2017 9:58:35 AM	1.680	gE
MOTOR DE HEA 2	6/7/2017 9:58:39 AM	6.667	gE
MOTOR DE VV	6/7/2017 9:58:49 AM	1.918	mm/s
MOTOR DE AV	6/7/2017 9:59:04 AM	0.977	mm/s
GB I/P DE HV-H	6/7/2017 10:04:53 AM	2.596	mm/s
GB I/P DE HV.L	6/7/2017 10:04:58 AM	1.712	mm/s
GB I/P DE HA	6/7/2017 10:05:01 AM	2.986	g
GB I/P DE HEA 1	6/7/2017 10:05:04 AM	3.846	gE
GB I/P DE HEA 2	6/7/2017 10:05:08 AM	7.118	gE
GB I/P DE VV	6/7/2017 10:05:18 AM	1.786	mm/s
GB I/P DE AV	6/7/2017 10:05:26 AM	1.743	mm/s
GB I/P NDE HV	6/7/2017 10:05:40 AM	1.901	mm/s
GB I/P NDE HV.L	6/7/2017 10:05:44 AM	4.344	mm/s
GB I/P NDE HA	6/7/2017 10:05:47 AM	5.887	g
GB I/P NDE HEA1	6/7/2017 10:05:51 AM	5.453	gE
GB I/P NDE HEA2	6/7/2017 10:05:54 AM	9.844	gE
GB I/P NDE VV	6/7/2017 10:06:05 AM	1.939	mm/s
GB I/P NDE AV	6/7/2017 10:06:14 AM	1.655	mm/s
GB INTER DE HV	6/7/2017 9:59:18 AM	1.896	mm/s
GB INTER DE HV.L	6/7/2017 9:59:23 AM	1.770	mm/s
GB INTER DE HA	6/7/2017 9:59:26 AM	1.267	g
GB INTER DE HEA1	6/7/2017 9:59:30 AM	4.545	gE
GB INTER DE HEA 2	6/7/2017 9:59:33 AM	10.459	gE

POINT name	Last Measurement Date/Time	Last value	Units
GB INTER DE VV	6/7/2017 9:59:43 AM	1.659	mm/s
GB INTER DE - AV	6/7/2017 9:59:52 AM	1.827	mm/s
GB INTER NDE HV	6/7/2017 10:06:28 AM	1.728	mm/s
GB INTER NDE HV.L	6/7/2017 10:06:32 AM	1.726	mm/s
GB INTER NDE HA	6/7/2017 10:06:35 AM	4.371	g
GB INTER NDE HEA1	6/7/2017 10:06:38 AM	3.056	gE
GB INTER NDE HEA2	6/7/2017 10:06:42 AM	7.406	gE
GB INTER NDE VV	6/7/2017 10:06:52 AM	2.284	mm/s
GB INTER NDE AV	6/7/2017 10:07:02 AM	2.125	mm/s
GB O/P DE - HV-L	6/7/2017 10:00:11 AM	1.551	mm/s
GB O/P DE - HV.H	6/7/2017 10:00:17 AM	1.616	mm/s
GB O/P DE HA	6/7/2017 10:00:22 AM	0.308	g
GB O/P DE HEA 1	6/7/2017 10:00:34 AM	2.391	gE
GB O/P DE HEA 2	6/7/2017 10:00:46 AM	5.955	gE
GB O/P DE VV	6/7/2017 10:01:01 AM	1.412	mm/s
GB O/P DE - AV	6/7/2017 10:01:12 AM	1.513	mm/s
GB O/P NDE HV-L	6/7/2017 10:01:36 AM	1.485	mm/s
GB O/P NDE HV.H	6/7/2017 10:01:42 AM	1.601	mm/s
GB O/P NDE HA	6/7/2017 10:01:47 AM	0.326	g
GB O/P NDE HEA1	6/7/2017 10:01:59 AM	1.306	gE
GB O/P NDE HEA2	6/7/2017 10:02:11 AM	1.900	gE
GB O/P NDE VV	6/7/2017 10:02:28 AM	1.535	mm/s
GB O/P NDE AV	6/7/2017 10:02:40 AM	1.710	mm/s
PINION DE HV	6/7/2017 10:03:00 AM	3.898	mm/s
PINION DE HV.H	6/7/2017 10:03:06 AM	4.057	mm/s
PINION DE HEA1	6/7/2017 10:03:19 AM	1.945	gE
PINION DE HEA2	6/7/2017 10:03:30 AM	1.704	gE
PINION DE VV	6/7/2017 10:03:48 AM	3.339	mm/s
PINION DE AV	6/7/2017 10:04:19 AM	3.226	mm/s
PINION NDE HV	6/7/2017 10:07:29 AM	4.095	mm/s
PINION NDE HV.H	6/7/2017 10:07:36 AM	4.210	mm/s
PINION NDE HEA1	6/7/2017 10:07:48 AM	2.766	gE
PINION NDE HEA2	6/7/2017 10:07:59 AM	1.447	gE
PINION NDE VV	6/7/2017 10:08:16 AM	2.168	mm/s
PINION NDE AV	6/7/2017 10:08:32 AM	2.487	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	7.6	8.5	ALERT
HAMMER SHAFT	5.7 (23.4 gE)	5.5 (34.8 gE)	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 8.5 mm/s recorded in the Motor bearings.

ANALYSIS:

- Overall health condition of the equipment is in ALERT 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

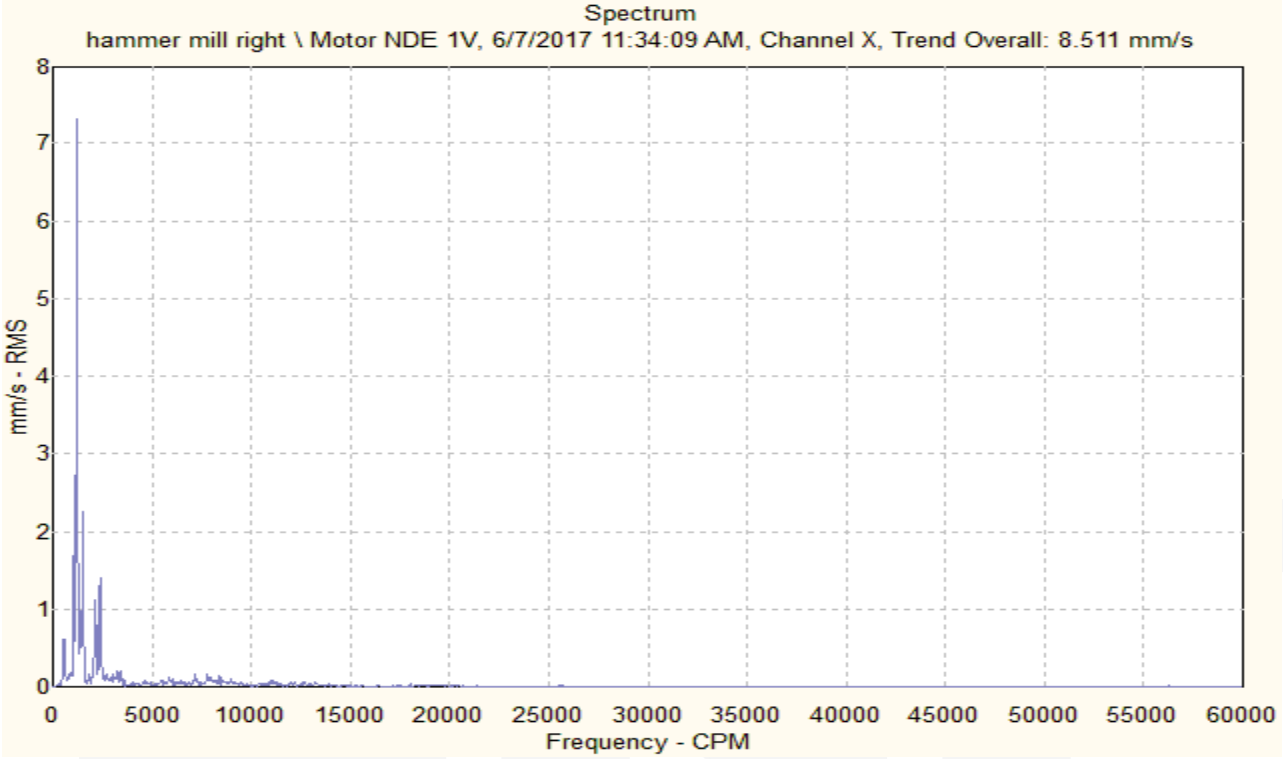
Source: hammer mill right

6/9/2017 5:20:58 PM

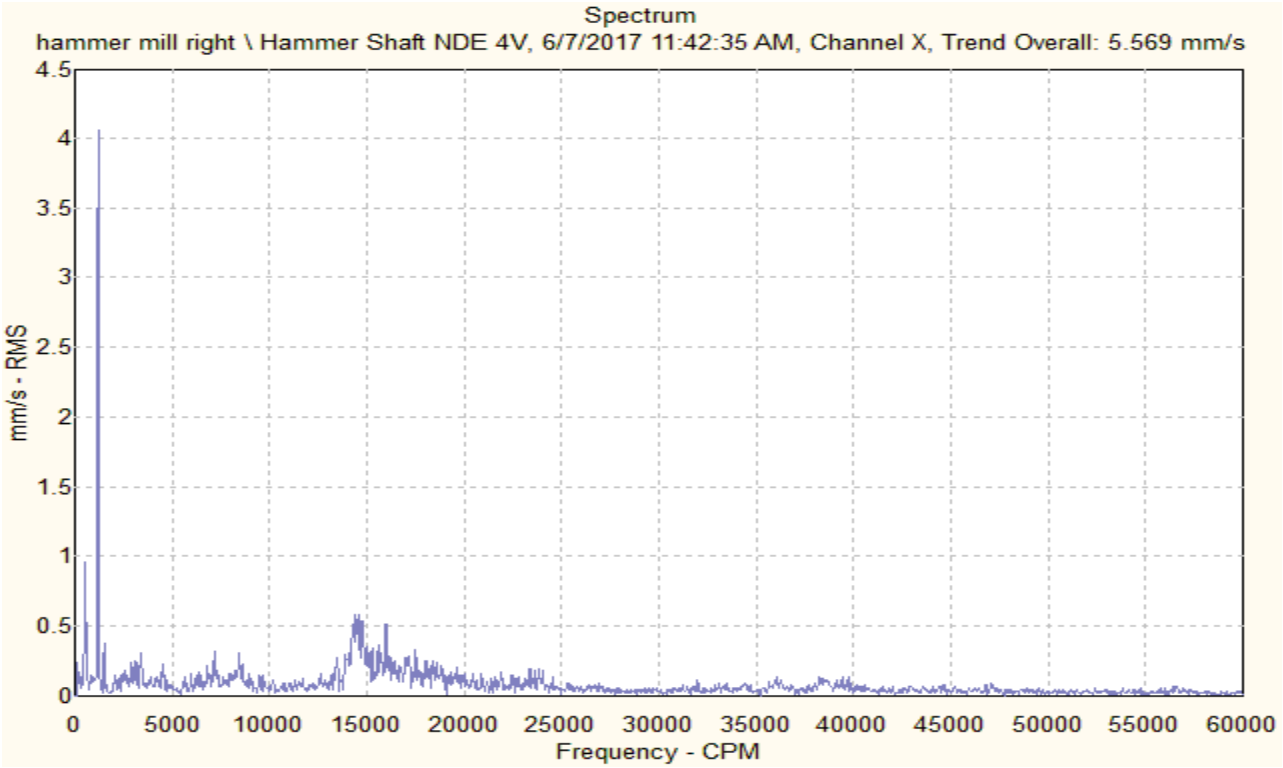
Last Measurement

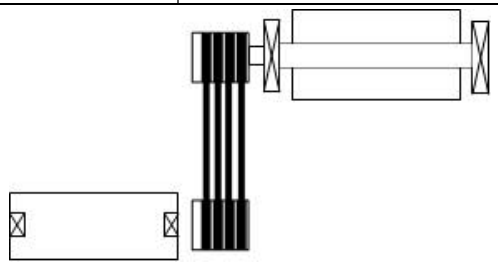
POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:33:49 AM	5.223	mm/s
Motor NDE 1HH	6/7/2017 11:33:53 AM	5.831	mm/s
Motor NDE HA	6/7/2017 11:33:56 AM	0.158	g
Motor NDE 1HgE3	6/7/2017 11:34:00 AM	1.578	gE
Motor NDE 1V	6/7/2017 11:34:09 AM	8.511	mm/s
Motor NDE 1A	6/7/2017 11:34:20 AM	4.592	mm/s
Motor DE 2HL	6/7/2017 11:34:33 AM	6.035	mm/s
Motor DE 2H	6/7/2017 11:34:36 AM	7.739	mm/s
Motor DE HA	6/7/2017 11:34:39 AM	0.172	g
Motor DE 2HgE3	6/7/2017 11:34:43 AM	2.646	gE
Motor DE 2V	6/7/2017 11:34:53 AM	7.007	mm/s
Motor DE 2A	6/7/2017 11:35:04 AM	5.308	mm/s
Hammer Shaft DE 3HL	6/7/2017 11:35:18 AM	3.529	mm/s
Hammer Shaft DE 3H	6/7/2017 11:35:22 AM	3.496	mm/s
Hammer Shaft DE HA	6/7/2017 11:35:25 AM	1.048	g
Hammer ShaftDE 3HgE3	6/7/2017 11:35:31 AM	34.814	gE
Hammer Shaft DE 3V	6/7/2017 11:35:52 AM	4.308	mm/s
Hammer Shaft DE 3A	6/7/2017 11:36:10 AM	4.006	mm/s
Hammer Shaft NDE 4HL	6/7/2017 11:41:19 AM	4.795	mm/s
Hammer Shaft NDE 4H	6/7/2017 11:41:23 AM	4.168	mm/s
Hammer Shaft NDE HA	6/7/2017 11:41:35 AM	1.633	g
Hammer ShafNDE 4HgE3	6/7/2017 11:41:48 AM	17.383	gE
Hammer Shaft NDE 4V	6/7/2017 11:42:35 AM	5.569	mm/s
Hammer Shaft NDE 4A	6/7/2017 11:42:16 AM	3.025	mm/s

hammer mill right \ Motor NDE 1V



hammer mill right \ Hammer Shaft NDE 4V



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	12.3	7.9	ALERT
HAMMER SHAFT	6.7 (22.3 gE)	4.5 (34.3 gE)	NORMAL

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 7.9 mm/s recorded in the Motor bearings.

ANALYSIS:

- Overall health condition of the equipment is in ALERT condition with slight increment, 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

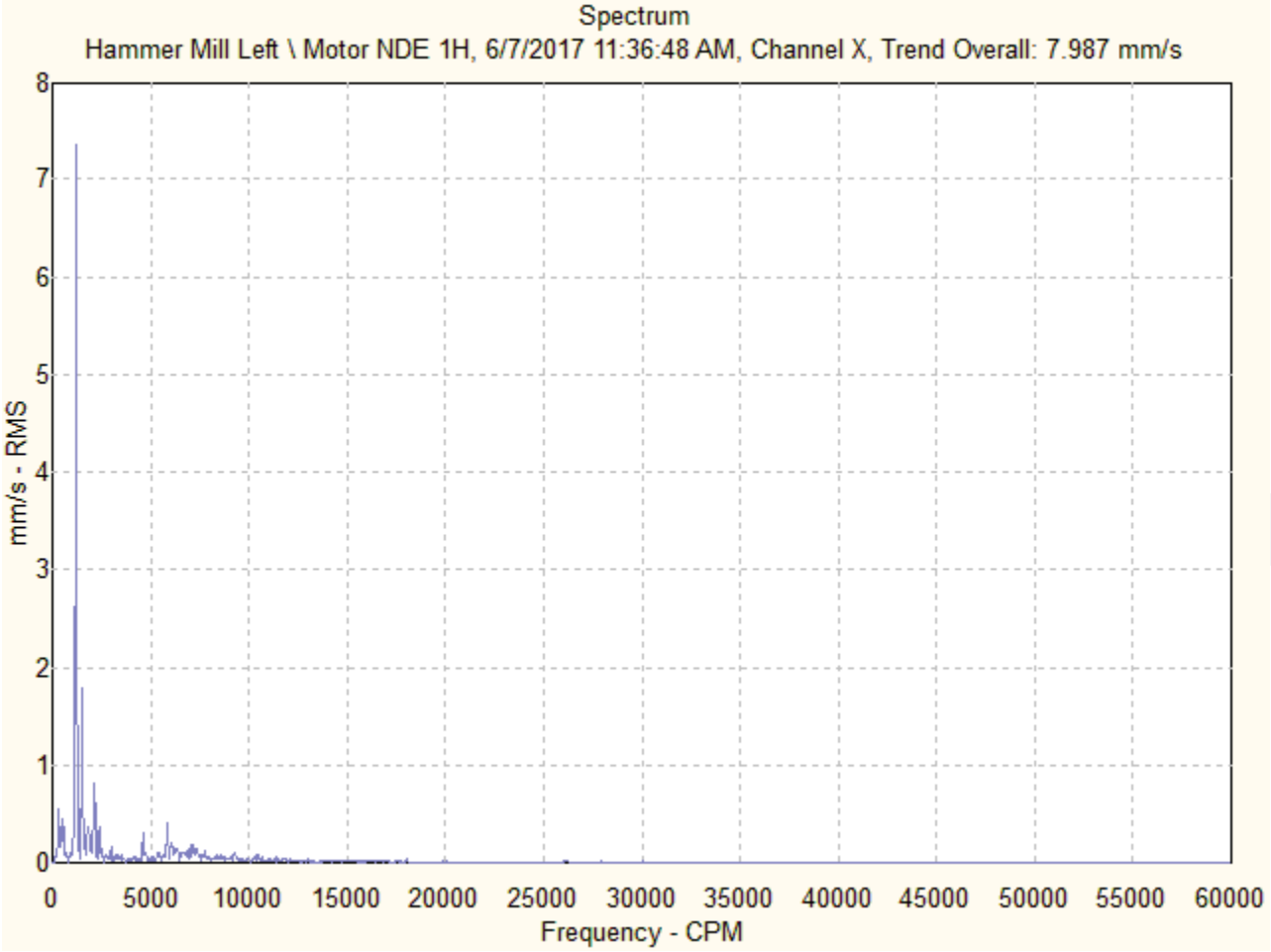
Source: Hammer Mill Left

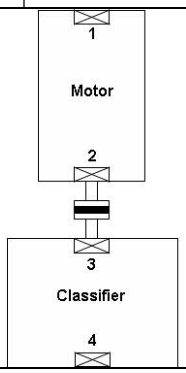
6/9/2017 5:22:01 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:36:48 AM	7.987	mm/s
Motor NDE 1HL	6/7/2017 11:36:51 AM	7.568	mm/s
Motor NDE HA	6/7/2017 11:36:55 AM	0.257	g
Motor NDE 1HgE3	6/7/2017 11:36:58 AM	1.629	gE
Motor NDE 1V	6/7/2017 11:37:10 AM	4.671	mm/s
Motor NDE 1A	6/7/2017 11:37:21 AM	5.358	mm/s
Motor DE 2HL	6/7/2017 11:37:39 AM	3.813	mm/s
Motor DE 2H	6/7/2017 11:37:42 AM	3.920	mm/s
Motor DE HA	6/7/2017 11:37:46 AM	0.166	g
Motor DE 2HgE3	6/7/2017 11:37:49 AM	5.235	gE
Motor DE 2V	6/7/2017 11:38:00 AM	5.718	mm/s
Motor DE 2A	6/7/2017 11:38:28 AM	6.128	mm/s
Hammer Shaft DE 3HL	6/7/2017 11:38:41 AM	3.674	mm/s
Hammer Shaft DE 3H	6/7/2017 11:38:45 AM	4.211	mm/s
Hammer Shaft DE HA	6/7/2017 11:38:49 AM	1.130	g
Hammer Shaft DE 3Hg	6/7/2017 11:38:54 AM	27.178	gE
Hammer Shaft DE 3V	6/7/2017 11:39:09 AM	3.274	mm/s
Hammer Shaft DE 3A	6/7/2017 11:39:25 AM	4.560	mm/s
Hammer Shaft NDE 4HL	6/7/2017 11:42:58 AM	3.574	mm/s
Hammer Shaft NDE 4H	6/7/2017 11:43:03 AM	4.104	mm/s
Hammer ShaftNDE HA	6/7/2017 11:43:06 AM	1.058	g
Hammer Shaft NDE 4Hg	6/7/2017 11:43:12 AM	34.353	gE
Hammer Shaft NDE 4V	6/7/2017 11:43:29 AM	4.484	mm/s
Hammer Shaft NDE 4A	6/7/2017 11:43:44 AM	3.141	mm/s

Hammer Mill Left \ Motor NDE 1H



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.7	2.7	NORMAL
CLASSIFIER	4.0 (11.1 gE)	4.9 (13.8 gE)	ALERT

OBSERVATIONS:

This equipment is indicating a "ALERT" behavior with maximum vibration amplitudes of 4.9 mm/s recorded in the Classifier bearings.

ANALYSIS:

- Indications of aerodynamic forces generated looseness in the system coupled with minor unbalance is sustaining whereas 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

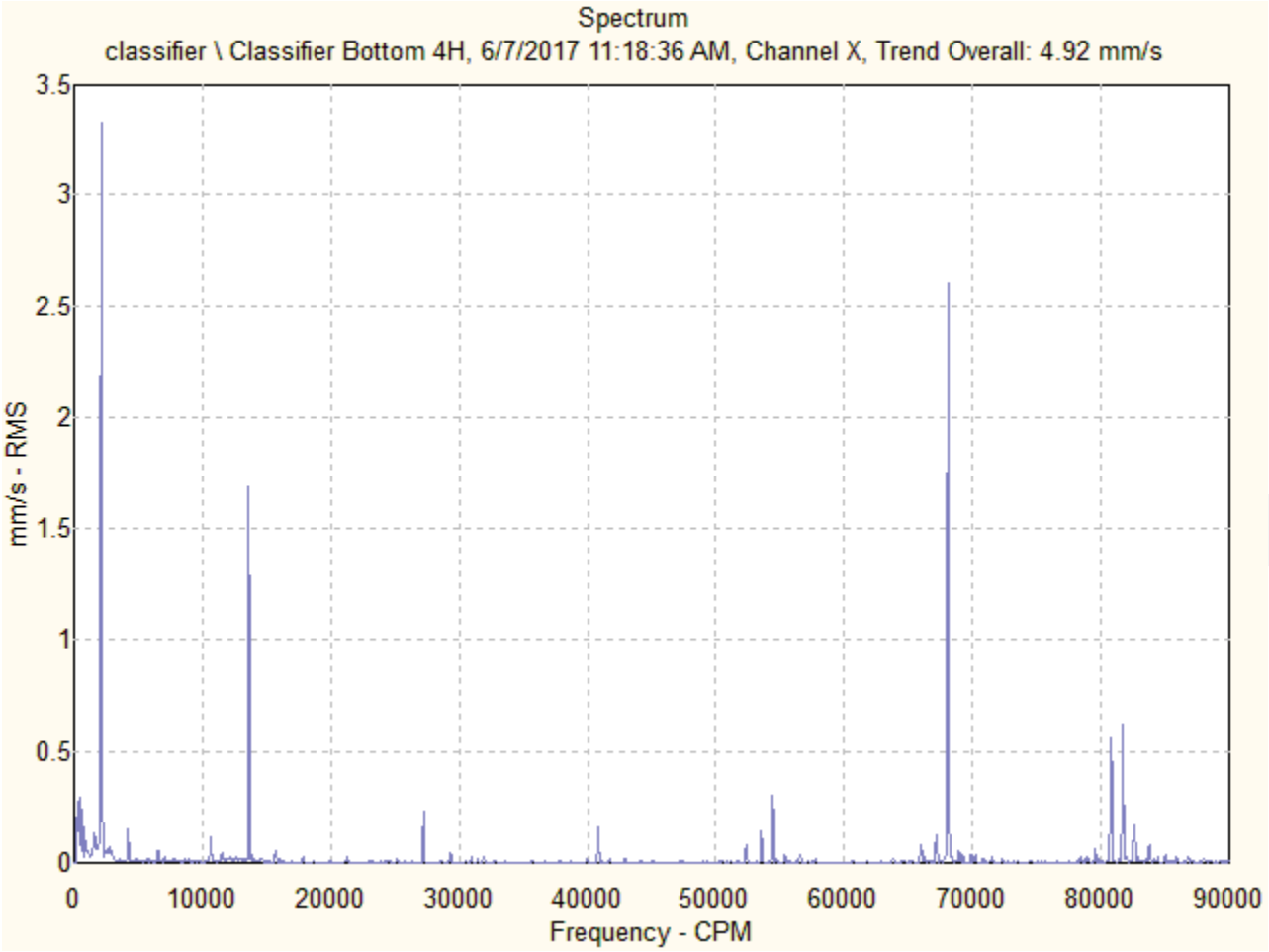
Source: classifier

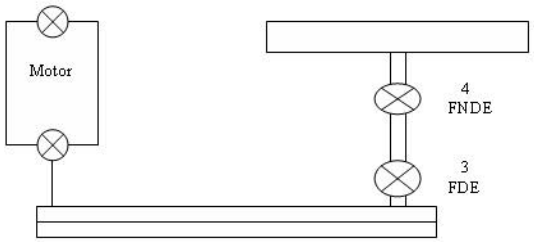
6/9/2017 5:23:25 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1HL	6/7/2017 11:13:39 AM	2.601	mm/s
Motor NDE 1H	6/7/2017 11:13:43 AM	2.620	mm/s
Motor NDE HA	6/7/2017 11:13:47 AM	0.450	g
Motor NDE 1HgE3	6/7/2017 11:13:50 AM	6.280	gE
Motor NDE 1V	6/7/2017 11:14:02 AM	1.740	mm/s
Motor NDE 1A	6/7/2017 11:14:14 AM	1.223	mm/s
Motor DE 2HL	6/7/2017 11:14:28 AM	2.736	mm/s
Motor DE 2H	6/7/2017 11:14:32 AM	1.296	mm/s
Motor DE HA	6/7/2017 11:14:35 AM	0.412	g
Motor DE 2HgE3	6/7/2017 11:14:39 AM	2.119	gE
Motor DE 2V	6/7/2017 11:14:50 AM	0.797	mm/s
Motor DE 2A	6/7/2017 11:15:02 AM	0.904	mm/s
Classifier Top 3HL	6/7/2017 11:16:49 AM	1.356	mm/s
Classifier Top 3H	6/7/2017 11:16:53 AM	1.715	mm/s
Classifier Top HA	6/7/2017 11:16:56 AM	1.028	g
Classifier Top 3Hg	6/7/2017 11:17:09 AM	1.278	gE
Classifier Top 3V	6/7/2017 11:17:22 AM	1.879	mm/s
Classifier Top 3A	6/7/2017 11:17:36 AM	1.607	mm/s
Classifier Bottom4HL	6/7/2017 11:18:32 AM	4.029	mm/s
Classifier Bottom 4H	6/7/2017 11:18:36 AM	4.920	mm/s
Classifier Bottom HA	6/7/2017 11:18:39 AM	2.284	g
Classifier Botto 4Hg	6/7/2017 11:18:43 AM	13.832	gE
Classifier Bottom 4V	6/7/2017 11:18:56 AM	1.322	mm/s
Classifier Bottom 4A	6/7/2017 11:19:13 AM	1.740	mm/s

classifier \ Classifier Bottom 4H



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.3	4.9	ALERT
AGLOMETER	2.9	2.9	NORMAL

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 4.9 mm/s recorded in the Motor bearings.

ANALYSIS:

- Minor symptoms of belt pulley misalignment with motor base structural looseness 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 for soft foot & correct the same, if any.

Last Measurement Report

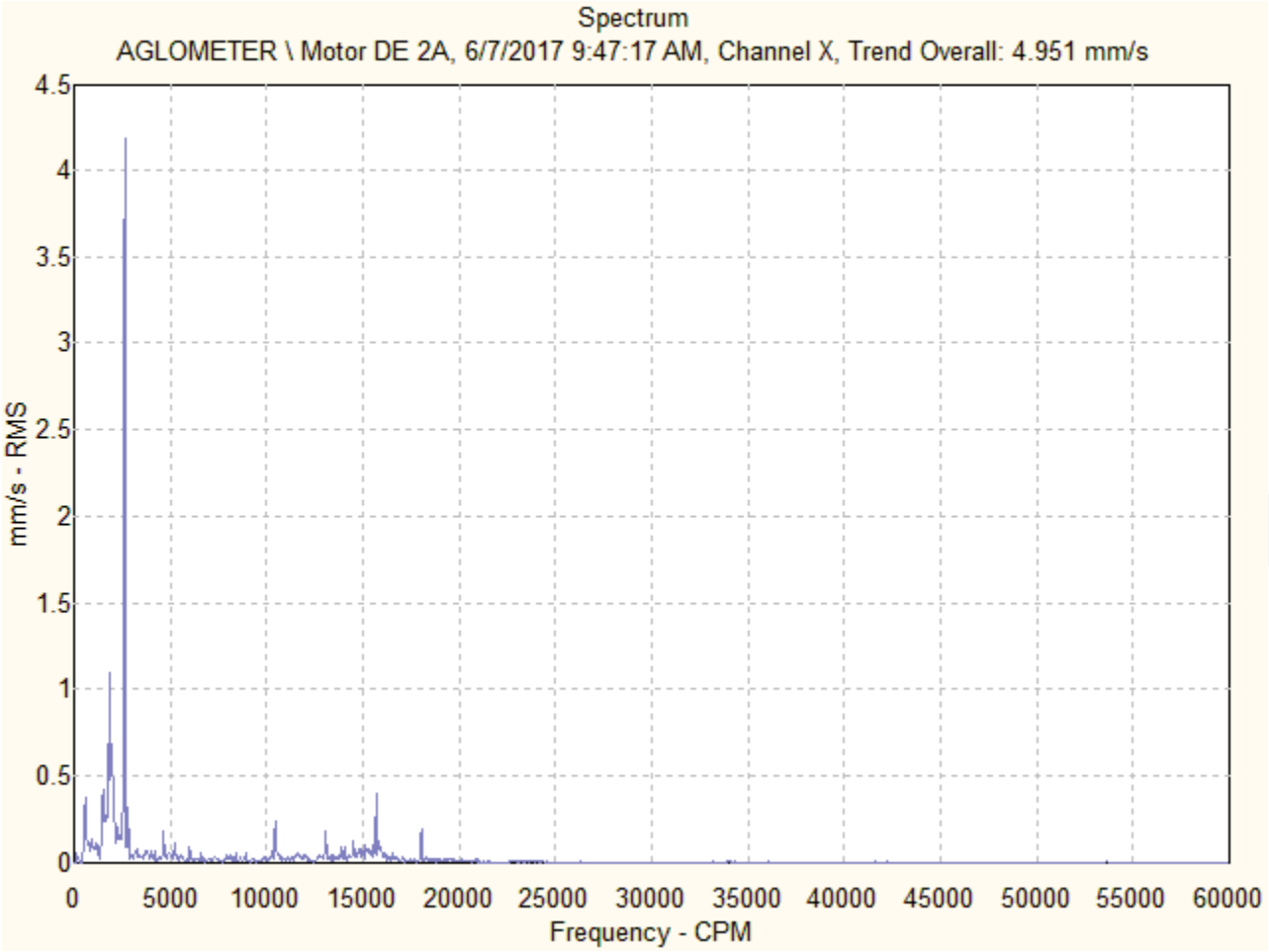
Source: DE AGGLOMETER

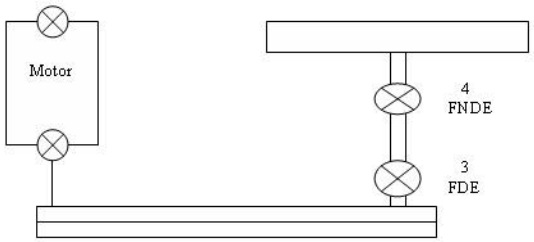
6/9/2017 5:24:11 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1HL	6/7/2017 9:45:36 AM	1.906	mm/s
Motor NDE 1H	6/7/2017 9:45:40 AM	1.808	mm/s
Motor NDE HA	6/7/2017 9:45:43 AM	0.208	g
Motor NDE 1HgE3	6/7/2017 9:45:46 AM	0.815	gE
Motor NDE 1V	6/7/2017 9:45:56 AM	2.863	mm/s
Motor NDE 1A	6/7/2017 9:46:22 AM	2.534	mm/s
Motor DE 2HL	6/7/2017 9:46:34 AM	2.329	mm/s
Motor DE 2H	6/7/2017 9:46:38 AM	2.367	mm/s
Motor DE HA	6/7/2017 9:46:41 AM	0.137	g
Motor DE 2HgE3	6/7/2017 9:46:45 AM	0.536	gE
Motor DE 2V	6/7/2017 9:47:06 AM	3.403	mm/s
Motor DE 2A	6/7/2017 9:47:17 AM	4.951	mm/s
Agglo DE 3HL	6/7/2017 9:47:34 AM	2.829	mm/s
AggloDE 3H	6/7/2017 9:47:38 AM	2.803	mm/s
Agglo DE HA	6/7/2017 9:47:41 AM	0.343	g
Agglo DE 3HgE3	6/7/2017 9:47:44 AM	4.234	gE
Agglo DE 3V	6/7/2017 9:48:21 AM	2.036	mm/s
Agglo DE 3A	6/7/2017 9:48:46 AM	2.026	mm/s
Agglo NDE 4HL	6/7/2017 9:47:57 AM	2.873	mm/s
Agglo NDE 4H	6/7/2017 9:48:01 AM	2.921	mm/s
Agglo NDE HA	6/7/2017 9:48:04 AM	0.371	g
Agglo NDE 4HgE3	6/7/2017 9:48:07 AM	4.232	gE
Agglo NDE 4V	6/7/2017 9:48:33 AM	2.084	mm/s
Agglo NDE 4A	6/7/2017 9:49:00 AM	1.808	mm/s

AGLOMETER \ Motor DE 2A



Vibration Analysis Report 07.06.2017		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 (22.02.2017)	Present (07.06.2017)	
MOTOR	5.3	5.1	NORMAL
BLENDER	3.8	4.2	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 5.1 mm/s recorded in the Motor bearings.

ANALYSIS:

- Vibrations increased slightly to ALERT range as per the previous history.
- Minor symptoms of belt pulley misalignment with motor base structural looseness 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.

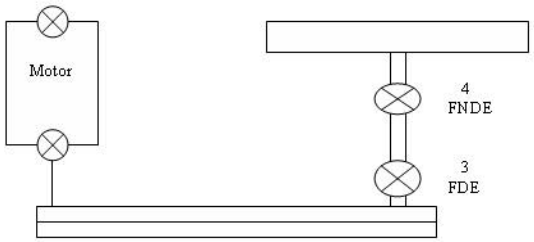
Last Measurement Report

Source: BLENDER HOUSING SIDE

6/9/2017 5:24:54 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 9:52:58 AM	4.413	mm/s
Motor NDE 1HL	6/7/2017 9:53:02 AM	4.203	mm/s
Motor NDE HA	6/7/2017 9:53:05 AM	0.299	g
Motor NDE 1HgE3	6/7/2017 9:53:09 AM	3.265	gE
Motor NDE 1V	6/7/2017 9:53:21 AM	3.614	mm/s
Motor NDE 1A	6/7/2017 9:53:50 AM	5.114	mm/s
Motor DE 2HL	6/7/2017 9:54:01 AM	3.255	mm/s
Motor DE 2H	6/7/2017 9:54:05 AM	3.199	mm/s
Motor DE HA	6/7/2017 9:54:08 AM	0.283	g
Motor DE 2HgE3	6/7/2017 9:54:11 AM	3.134	gE
Motor DE 2V	6/7/2017 9:54:22 AM	2.314	mm/s
Motor DE 2A	6/7/2017 9:54:33 AM	4.371	mm/s
Blender DE 3HL	6/7/2017 9:54:59 AM	3.972	mm/s
Blender DE 3H	6/7/2017 9:55:03 AM	4.242	mm/s
Blender DE HA	6/7/2017 9:55:07 AM	0.207	g
Blender DE HEA	6/7/2017 9:55:10 AM	2.354	gE
Blender DE 3V	6/7/2017 9:55:57 AM	2.251	mm/s
Blender DE 3A	6/7/2017 9:56:10 AM	3.165	mm/s
Blender NDE 4HL	6/7/2017 9:55:22 AM	3.738	mm/s
Blender NDE 4H	6/7/2017 9:55:26 AM	3.820	mm/s
Blender NDE HA	6/7/2017 9:55:29 AM	0.192	g
Blender NDE HEA	6/7/2017 9:55:33 AM	2.256	gE
Blender NDE 4V	6/7/2017 9:55:45 AM	2.111	mm/s
Blender NDE 4A	6/7/2017 9:56:22 AM	3.205	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	6.5	6.1	NORMAL
BLENDER	3.7	3.8	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.1 mm/s recorded in the Motor bearings.

ANALYSIS:

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

ACTION PLAN:

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

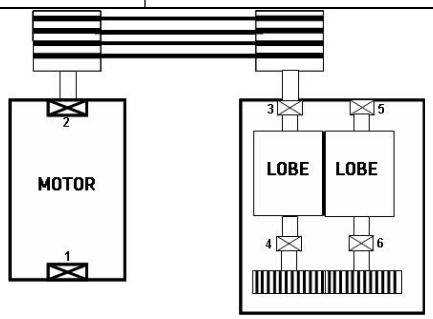
Last Measurement Report

Source: BLENDER DOORSIDE

6/9/2017 5:25:26 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 9:49:30 AM	3.133	mm/s
Motor NDE 1HL	6/7/2017 9:49:33 AM	3.319	mm/s
Motor NDE HA	6/7/2017 9:49:37 AM	0.321	g
Motor NDE 1HgE3	6/7/2017 9:49:40 AM	1.664	gE
Motor NDE 1V	6/7/2017 9:49:54 AM	6.115	mm/s
Motor NDE 1A	6/7/2017 9:49:58 AM	4.164	mm/s
Motor DE 2HL	6/7/2017 9:50:13 AM	4.310	mm/s
Motor DE 2H	6/7/2017 9:50:17 AM	4.249	mm/s
Motor DE HA	6/7/2017 9:50:20 AM	0.192	g
Motor DE 2HgE3	6/7/2017 9:50:24 AM	3.048	gE
Motor DE 2V	6/7/2017 9:50:34 AM	5.976	mm/s
Motor DE 2A	6/7/2017 9:50:48 AM	4.884	mm/s
Blender DE 3HL-V	6/7/2017 9:51:02 AM	1.856	mm/s
Blender DE 3HV	6/7/2017 9:51:06 AM	1.696	mm/s
Blender DE HA	6/7/2017 9:51:09 AM	0.176	g
Blender DE HEA	6/7/2017 9:51:12 AM	3.515	gE
Blender DE 3VV	6/7/2017 9:52:05 AM	3.571	mm/s
Blender DE 3AV	6/7/2017 9:52:16 AM	1.852	mm/s
Blender NDE 4HL	6/7/2017 9:51:29 AM	1.665	mm/s
Blender NDE 4H	6/7/2017 9:51:33 AM	1.588	mm/s
Blender NDE 4HA	6/7/2017 9:51:36 AM	0.174	g
Blender NDE 4HEA	6/7/2017 9:51:40 AM	3.333	gE
Blender NDE 4VV	6/7/2017 9:51:51 AM	3.821	mm/s
Blender NDE 4AV	6/7/2017 9:52:28 AM	1.715	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	2.3	1.5	NORMAL
BLOWER	3.9	3.1	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 3.1 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 on next available opportunity.
2. Specially to ensure the proper root clearances & adequate air gap. Also check the suction filter for any abnormality.

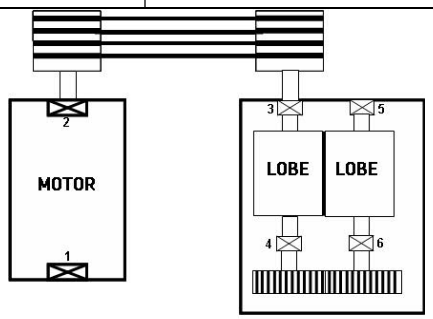
Last Measurement Report

Source: Blender Aeration Blr

6/9/2017 5:25:55 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:08:50 AM	1.324	mm/s
Motor NDE HA	6/7/2017 11:08:53 AM	0.208	g
Motor NDE 1HgE3	6/7/2017 11:08:57 AM	2.328	gE
Motor NDE 1V	6/7/2017 11:09:09 AM	1.296	mm/s
Motor NDE 1A	6/7/2017 11:09:21 AM	1.505	mm/s
Motor DE 2H	6/7/2017 11:09:30 AM	1.216	mm/s
Motor DE HA	6/7/2017 11:09:33 AM	0.199	g
Motor DE 2HgE3	6/7/2017 11:09:36 AM	1.668	gE
Motor DE 2V	6/7/2017 11:09:47 AM	1.339	mm/s
Motor DE 2A	6/7/2017 11:09:56 AM	1.514	mm/s
Fan DE 3H	6/7/2017 11:10:05 AM	1.832	mm/s
Fan DE 3HA	6/7/2017 11:10:08 AM	0.520	g
Fan DE 3HgE3	6/7/2017 11:10:12 AM	3.821	gE
Fan DE 3V	6/7/2017 11:10:23 AM	2.352	mm/s
Fan DE 3A	6/7/2017 11:10:33 AM	2.514	mm/s
Fan NDE 4H	6/7/2017 11:10:46 AM	1.349	mm/s
Fan NDE 4HA	6/7/2017 11:10:49 AM	0.237	g
Fan NDE 4HgE3	6/7/2017 11:10:54 AM	1.492	gE
Fan NDE 4V	6/7/2017 11:11:07 AM	1.600	mm/s
Fan NDE 4A	6/7/2017 11:11:20 AM	2.695	mm/s
Fan DE 5H	6/7/2017 11:11:35 AM	1.438	mm/s
Fan DE 5HA	6/7/2017 11:11:38 AM	0.192	g
Fan DE 5HgE3	6/7/2017 11:11:42 AM	1.344	gE
Fan DE 5V	6/7/2017 11:11:57 AM	1.447	mm/s
Fan DE 5A	6/7/2017 11:12:08 AM	3.160	mm/s
Fan NDE 6HV	6/7/2017 11:12:17 AM	2.003	mm/s
Fan NDE 6HA	6/7/2017 11:12:20 AM	0.373	g
Fan NDE 6HgE3	6/7/2017 11:12:24 AM	2.034	gE
Fan NDE 6VV	6/7/2017 11:12:37 AM	2.724	mm/s
Fan NDE 6AV	6/7/2017 11:12:47 AM	2.962	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	5.9	6.2	NORMAL
BLOWER	6.0	6.4	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.4 mm/s recorded in the Blower bearings.

ANALYSIS:

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

ACTION PLAN:

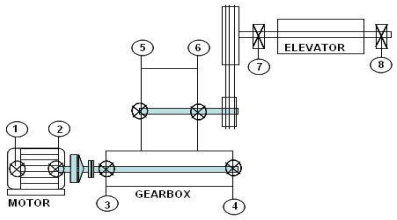
1. Its is suggested to keep close monitoring over change in any parameter during routine physical observations.

Last Measurement Report

Source: prodt siloareatioblo

6/9/2017 5:26:23 PM

POINT name	Last Measurement Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:54:16 AM	6.269	mm/s
Motor NDE HA	6/7/2017 10:54:19 AM	0.469	g
Motor NDE 1HgE3	6/7/2017 10:54:23 AM	1.626	gE
Motor NDE 1V	6/7/2017 10:54:32 AM	3.705	mm/s
Motor NDE 1A	6/7/2017 10:54:42 AM	2.606	mm/s
Motor DE 2H	6/7/2017 10:54:50 AM	6.492	mm/s
Motor DE HA	6/7/2017 10:54:54 AM	0.514	g
MOTOR DE HEA 1	6/7/2017 10:54:57 AM	2.375	gE
Motor DE 2HgE3	6/7/2017 10:55:00 AM	2.036	gE
Motor DE 2V	6/7/2017 10:55:10 AM	3.549	mm/s
Motor DE 2A	6/7/2017 10:55:19 AM	2.736	mm/s
BLOWER DE 3HV	6/7/2017 10:55:29 AM	6.439	mm/s
BLOWER DE 3HA	6/7/2017 10:55:32 AM	1.024	g
BLOWER DE 3HEA 2	6/7/2017 10:55:36 AM	5.061	gE
BLOWER DE 3VV	6/7/2017 10:55:47 AM	3.995	mm/s
BLOWER DE 3AV	6/7/2017 10:55:56 AM	5.805	mm/s
BLOWER NDE4HV	6/7/2017 10:56:05 AM	5.366	mm/s
BLOWER NDE4HA	6/7/2017 10:56:08 AM	0.608	g
BLOWER NDE4VV	6/7/2017 10:56:19 AM	3.992	mm/s
BLOWER NDE4AV	6/7/2017 10:56:32 AM	3.987	mm/s
BLOWER DE 5HV-H	6/7/2017 10:56:44 AM	5.424	mm/s
BLOWER DE 5HV.L	6/7/2017 10:56:49 AM	4.848	mm/s
BLOWER DE 5HA	6/7/2017 10:56:52 AM	1.115	g
BLOWER DE 5HEA 2	6/7/2017 10:56:56 AM	5.575	gE
BLOWER DE 5VV	6/7/2017 10:57:05 AM	4.875	mm/s
BLOWER DE 5AV	6/7/2017 10:57:14 AM	3.027	mm/s
BLOWER NDE 6HV	6/7/2017 10:57:24 AM	6.251	mm/s
BLOWER NDE 6HV.L	6/7/2017 10:57:29 AM	6.253	mm/s
BLOWER NDE 6HA	6/7/2017 10:57:32 AM	1.283	g
BLOWER NDE 6HEA2	6/7/2017 10:57:36 AM	3.535	gE
BLOWER NDE 6VV	6/7/2017 10:57:45 AM	4.223	mm/s
BLOWER NDE 6AV	6/7/2017 10:57:55 AM	3.320	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	3.1	3.4	NORMAL
GEARBOX	3.9	4.2	NORMAL
ELEVATOR	2.1	2.7	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.2 mm/s recorded at the Gearbox side.

ANALYSIS:

- The health condition of the equipment is NORMAL as per ISO standards with slight increment in vibrations observed with respect to past trend with indications of 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 / soft foot & rectify the same if needed.

Last Measurement Report

Source: DIS.BUC.ELEVATOR

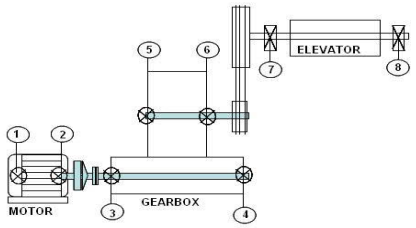
6/9/2017 5:27:18 PM

Last Measurement

POINT name	Date/Time	Last value	Units
MOTOR NDE HV	6/7/2017 10:22:46 AM	1.740	mm/s
MOTOR NDE HA	6/7/2017 10:22:49 AM	0.193	g
MOTOR NDE HEA 1	6/7/2017 10:22:53 AM	0.644	gE
MOTOR NDE HEA 2	6/7/2017 10:22:56 AM	1.604	gE
MOTOR NDE VV	6/7/2017 10:23:06 AM	3.409	mm/s
MOTOR NDE AV	6/7/2017 10:23:18 AM	2.884	mm/s
MOTOR DE HV	6/7/2017 10:23:26 AM	1.865	mm/s
MOTOR DE HA	6/7/2017 10:23:29 AM	0.115	g
MOTOR DE HEA 1	6/7/2017 10:23:33 AM	0.374	gE
MOTOR DE HEA 2	6/7/2017 10:23:36 AM	1.834	gE
MOTOR DE VV	6/7/2017 10:23:47 AM	2.371	mm/s
MOTOR DE AV	6/7/2017 10:24:00 AM	2.753	mm/s
GB I/P DE HV.L	6/7/2017 10:24:11 AM	2.085	mm/s
GB I/P DE HV-H	6/7/2017 10:24:15 AM	1.910	mm/s
GB I/P DE HA	6/7/2017 10:24:18 AM	0.083	g
GB I/P DE HEA 1	6/7/2017 10:24:21 AM	0.389	gE
GB I/P DE HEA 2	6/7/2017 10:24:25 AM	1.928	gE
GB I/P DE VV	6/7/2017 10:24:36 AM	1.609	mm/s
GB I/P DE AV	6/7/2017 10:24:46 AM	3.537	mm/s
GB O/P DE - HV-L	6/7/2017 10:25:05 AM	3.431	mm/s
GB O/P DE - HV.H	6/7/2017 10:25:10 AM	4.218	mm/s
GB O/P DE HA	6/7/2017 10:25:15 AM	0.097	g
GB O/P DE HEA 1	6/7/2017 10:25:27 AM	0.302	gE
GB O/P DE HEA 2	6/7/2017 10:25:39 AM	1.382	gE
GB O/P DE VV	6/7/2017 10:25:55 AM	2.306	mm/s
GB O/P DE - AV	6/7/2017 10:26:08 AM	2.960	mm/s
GB O/P NDE HV-L	6/7/2017 10:26:26 AM	4.214	mm/s
GB O/P NDE HV.H	6/7/2017 10:26:32 AM	3.930	mm/s
GB O/P NDE HA	6/7/2017 10:26:37 AM	0.069	g
GB O/P NDE HEA1	6/7/2017 10:26:49 AM	0.321	gE
GB O/P NDE HEA2	6/7/2017 10:27:01 AM	1.143	gE

Last Measurement

POINT name	Date/Time	Last value	Units
GB O/P NDE VV	6/7/2017 10:27:18 AM	1.564	mm/s
GB O/P NDE AV	6/7/2017 10:27:30 AM	2.325	mm/s
PINION DE HV	6/7/2017 10:27:50 AM	2.459	mm/s
PINION DE HV.H	6/7/2017 10:27:57 AM	2.795	mm/s
PINION DE HEA1	6/7/2017 10:28:09 AM	0.314	gE
PINION DE HEA2	6/7/2017 10:28:21 AM	0.365	gE
PINION DE VV	6/7/2017 10:28:39 AM	1.175	mm/s
PINION DE AV	6/7/2017 10:28:54 AM	1.559	mm/s
PINION NDE HV	6/7/2017 10:29:18 AM	2.427	mm/s
PINION NDE HV.H	6/7/2017 10:29:25 AM	2.198	mm/s
PINION NDE HEA1	6/7/2017 10:29:37 AM	0.093	gE
PINION NDE HEA2	6/7/2017 10:29:49 AM	0.048	gE
PINION NDE VV	6/7/2017 10:30:04 AM	0.965	mm/s
PINION NDE AV	6/7/2017 10:30:19 AM	1.505	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	6.0	3.5	NORMAL
GEARBOX	4.6	3.8	NORMAL
ELEVATOR	4.3	4.1	NORMAL

OBSERVATIONS:

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

ANALYSIS:

- Vibrations reduced considerably to NORMAL range as per the previous trend but slightly higher in horizontal directions indicating symptoms of minor misalignment in the system.

ACTION PLAN:

1. It is suggested to review machine train alignment.
2. Also check base bolts for equally balanced tightening on next available opportunity.

Last Measurement Report

Source: FEED SILO ELEVATOR

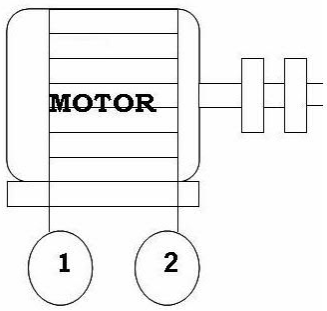
6/9/2017 5:27:48 PM

Last Measurement

POINT name	Date/Time	Last value	Units
MOTOR NDE HV	6/7/2017 10:35:36 AM	2.887	mm/s
MOTOR NDE HA	6/7/2017 10:35:39 AM	0.162	g
MOTOR NDE HEA 1	6/7/2017 10:35:43 AM	0.727	gE
MOTOR NDE HEA 2	6/7/2017 10:35:46 AM	0.674	gE
MOTOR NDE VV	6/7/2017 10:35:57 AM	3.029	mm/s
MOTOR NDE AV	6/7/2017 10:36:06 AM	2.573	mm/s
MOTOR DE HV	6/7/2017 10:36:14 AM	3.513	mm/s
MOTOR DE HA	6/7/2017 10:36:18 AM	0.175	g
MOTOR DE HEA 1	6/7/2017 10:36:21 AM	1.088	gE
MOTOR DE HEA 2	6/7/2017 10:36:25 AM	1.631	gE
MOTOR DE VV	6/7/2017 10:36:35 AM	3.121	mm/s
MOTOR DE AV	6/7/2017 10:36:45 AM	1.938	mm/s
GB I/P DE HV-H	6/7/2017 10:36:54 AM	2.571	mm/s
GB I/P DE HV.L	6/7/2017 10:36:59 AM	2.456	mm/s
GB I/P DE HA	6/7/2017 10:37:02 AM	0.171	g
GB I/P DE HEA 1	6/7/2017 10:37:06 AM	0.693	gE
GB I/P DE HEA 2	6/7/2017 10:37:10 AM	0.775	gE
GB I/P DE VV	6/7/2017 10:37:21 AM	3.274	mm/s
GB I/P DE AV	6/7/2017 10:37:35 AM	2.454	mm/s
GB O/P DE - HV-L	6/7/2017 10:39:28 AM	3.151	mm/s
GB O/P DE - HV.H	6/7/2017 10:39:33 AM	3.836	mm/s
GB O/P DE HA	6/7/2017 10:39:38 AM	0.195	g
GB O/P DE HEA 1	6/7/2017 10:39:51 AM	0.721	gE
GB O/P DE HEA 2	6/7/2017 10:40:02 AM	1.074	gE
GB O/P DE VV	6/7/2017 10:40:19 AM	3.005	mm/s
GB O/P DE - AV	6/7/2017 10:40:30 AM	3.273	mm/s
GB O/P NDE HV-L	6/7/2017 10:41:05 AM	2.642	mm/s
GB O/P NDE HV.H	6/7/2017 10:41:11 AM	2.530	mm/s
GB O/P NDE HA	6/7/2017 10:41:16 AM	0.101	g
GB O/P NDE HEA1	6/7/2017 10:41:28 AM	0.369	gE
GB O/P NDE HEA2	6/7/2017 10:41:40 AM	0.440	gE

Last Measurement

POINT name	Date/Time	Last value	Units
GB O/P NDE VV	6/7/2017 10:42:30 AM	3.620	mm/s
GB O/P NDE AV	6/7/2017 10:42:41 AM	2.586	mm/s
PINION DE HV	6/7/2017 10:42:59 AM	3.983	mm/s
PINION DE HV.H	6/7/2017 10:43:06 AM	4.114	mm/s
PINION DE HEA1	6/7/2017 10:43:19 AM	0.402	gE
PINION DE HEA2	6/7/2017 10:43:30 AM	0.240	gE
PINION DE VV	6/7/2017 10:43:48 AM	1.508	mm/s
PINION DE AV	6/7/2017 10:44:04 AM	2.543	mm/s
PINION NDE HV	6/7/2017 10:44:36 AM	2.544	mm/s
PINION NDE HV.H	6/7/2017 10:44:43 AM	2.774	mm/s
PINION NDE HEA1	6/7/2017 10:44:56 AM	0.236	gE
PINION NDE HEA2	6/7/2017 10:45:13 AM	0.164	gE
PINION NDE VV	6/7/2017 10:45:31 AM	2.604	mm/s
PINION NDE AV	6/7/2017 10:46:18 AM	2.578	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	5.2	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:

- 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

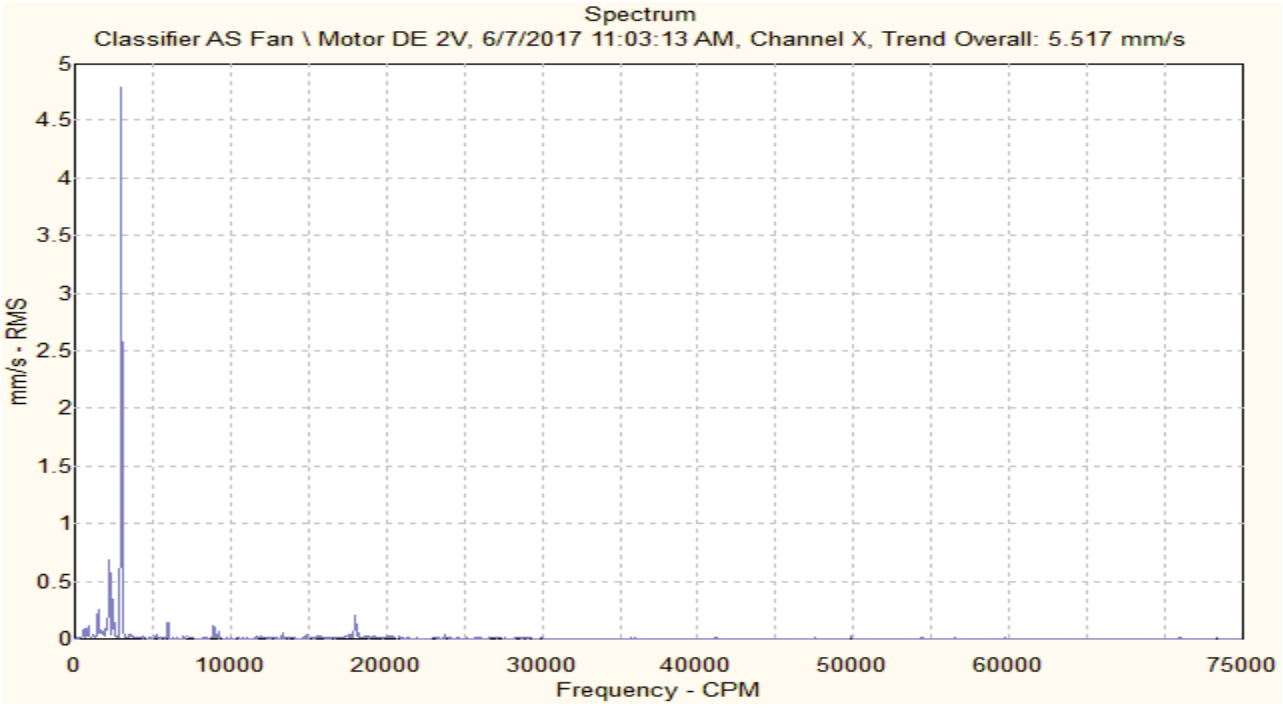
Source: Classifier AS Fan

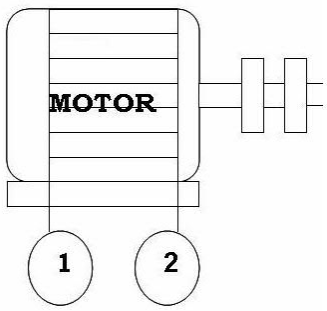
6/9/2017 5:28:21 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:02:11 AM	1.412	mm/s
Motor NDE 1HL	6/7/2017 11:02:19 AM	1.308	mm/s
Motor NDE HA	6/7/2017 11:02:22 AM	0.141	g
Motor NDE 1HgE3	6/7/2017 11:02:26 AM	0.448	gE
Motor NDE 1V	6/7/2017 11:02:38 AM	5.129	mm/s
Motor NDE 1A	6/7/2017 11:02:47 AM	1.320	mm/s
Motor DE 2H	6/7/2017 11:02:56 AM	1.684	mm/s
Motor DE HA	6/7/2017 11:02:59 AM	0.609	g
Motor DE 2HgE3	6/7/2017 11:03:03 AM	0.884	gE
Motor DE 2V	6/7/2017 11:03:13 AM	5.517	mm/s
Motor DE 2A	6/7/2017 11:03:22 AM	1.225	mm/s

Classifier AS Fan \ Motor DE 2V



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	5.5	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 just below NORMAL range as per ISO standards but vibrations trending slightly 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.

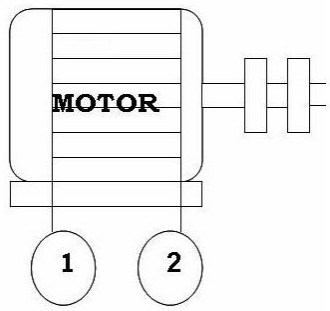
Last Measurement Report

Source: Class. Air Seal Fan

6/9/2017 5:29:02 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 11:03:42 AM	2.544	mm/s
Motor NDE 1HL	6/7/2017 11:03:50 AM	2.752	mm/s
Motor NDE HA	6/7/2017 11:03:53 AM	0.147	g
Motor NDE 1HgE3	6/7/2017 11:03:57 AM	0.424	gE
Motor NDE 1V	6/7/2017 11:04:09 AM	2.881	mm/s
Motor NDE 1A	6/7/2017 11:05:13 AM	4.147	mm/s
Motor DE 2H	6/7/2017 11:04:26 AM	1.566	mm/s
Motor DE HA	6/7/2017 11:04:29 AM	0.123	g
Motor DE 2HgE3	6/7/2017 11:04:33 AM	1.429	gE
Motor DE 2V	6/7/2017 11:04:43 AM	1.377	mm/s
Motor DE 2A	6/7/2017 11:04:52 AM	4.459	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	5.5	6.4	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.4 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.

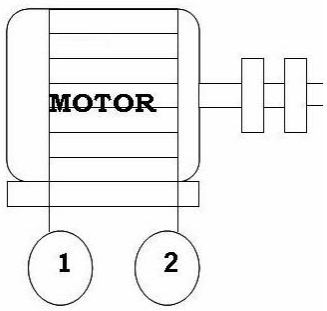
Last Measurement Report

Source: Silo No1 Binvent Fan

6/9/2017 5:29:32 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:11:22 AM	6.496	mm/s
Motor NDE 1HL	6/7/2017 10:11:30 AM	6.476	mm/s
Motor NDE HA	6/7/2017 10:11:33 AM	0.191	g
Motor NDE 1HgE3	6/7/2017 10:11:37 AM	0.630	gE
Motor NDE 1V	6/7/2017 10:11:46 AM	2.378	mm/s
Motor NDE 1A	6/7/2017 10:11:55 AM	4.901	mm/s
Motor DE 2H	6/7/2017 10:12:05 AM	5.000	mm/s
Motor DE HA	6/7/2017 10:12:08 AM	0.224	g
Motor DE 2HgE3	6/7/2017 10:12:12 AM	0.565	gE
Motor DE 2V	6/7/2017 10:12:22 AM	1.948	mm/s
Motor DE 2A	6/7/2017 10:12:31 AM	4.660	mm/s

Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	12.9	12.5	ALARM

OBSERVATIONS:

This equipment is indicating an "ALARM" behavior with maximum vibration amplitudes of 12.5 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 standards and in ALARM range.
- Symptoms of considerable structural looseness indicated in the system.

ACTION PLAN:

1. It is suggested to clean coating accumulated on fan impeller as per schedule, Meanwhile it is suggested to Plan for replacement / strengthening of rusted base frame on next available opportunity to reduce the vibration level further.

Last Measurement Report

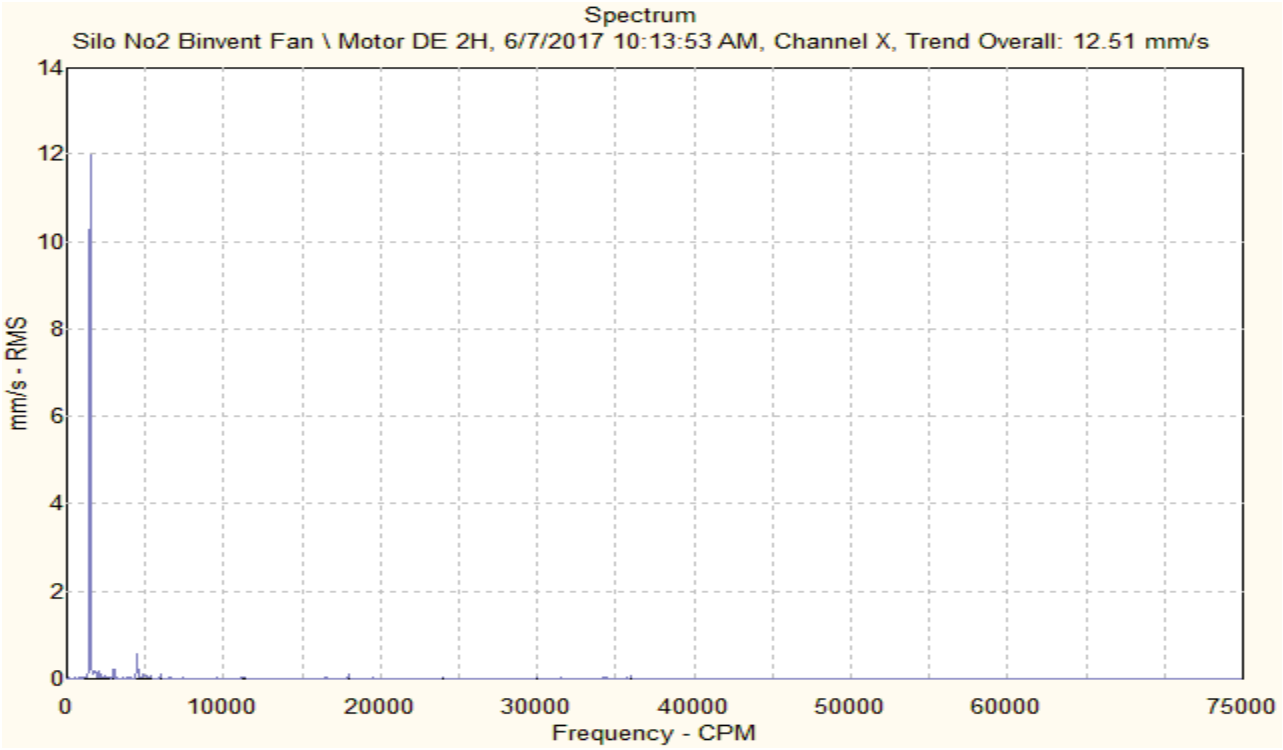
Source: Silo No2 Binvent Fan

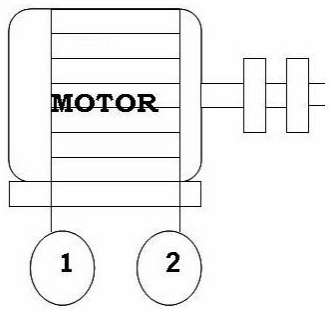
6/9/2017 5:29:54 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:12:49 AM	11.117	mm/s
Motor NDE 1HL	6/7/2017 10:12:57 AM	11.377	mm/s
Motor NDE HA	6/7/2017 10:13:00 AM	0.210	g
Motor NDE 1HgE3	6/7/2017 10:13:04 AM	0.330	gE
Motor NDE 1V	6/7/2017 10:13:34 AM	1.934	mm/s
Motor NDE 1A	6/7/2017 10:13:43 AM	6.317	mm/s
Motor DE 2H	6/7/2017 10:13:53 AM	12.507	mm/s
Motor DE HA	6/7/2017 10:13:55 AM	0.213	g
Motor DE 2HgE3	6/7/2017 10:14:00 AM	0.220	gE
Motor DE 2V	6/7/2017 10:14:11 AM	3.307	mm/s
Motor DE 2A	6/7/2017 10:14:22 AM	7.594	mm/s

Silo No2 Binvent Fan \ Motor DE 2H



Vibration Analysis Report 07.06.2017		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 (22.03.2017)	Present (07.06.2017)	
MOTOR	8.5	13.1	ALERT

OBSERVATIONS:

This equipment is indicating an "ALERT" behavior with maximum vibration amplitudes of 13.1 mm/s recorded in the Motor bearings.

ANALYSIS:

- Although vibrations reduced significantly as per the previous history but still in ALARM range.
- Symptoms of considerable unbalance indicated at fan impeller coupled with structural looseness.

ACTION PLAN:

1. It is suggested to clean coating accumulated on fan impeller on priority basis. Also ensure the frame bolt's length is optimum to provide rigidity to the system.
2. Plan for replacement / strengthening of rusted base frame on next available opportunity.

Last Measurement Report

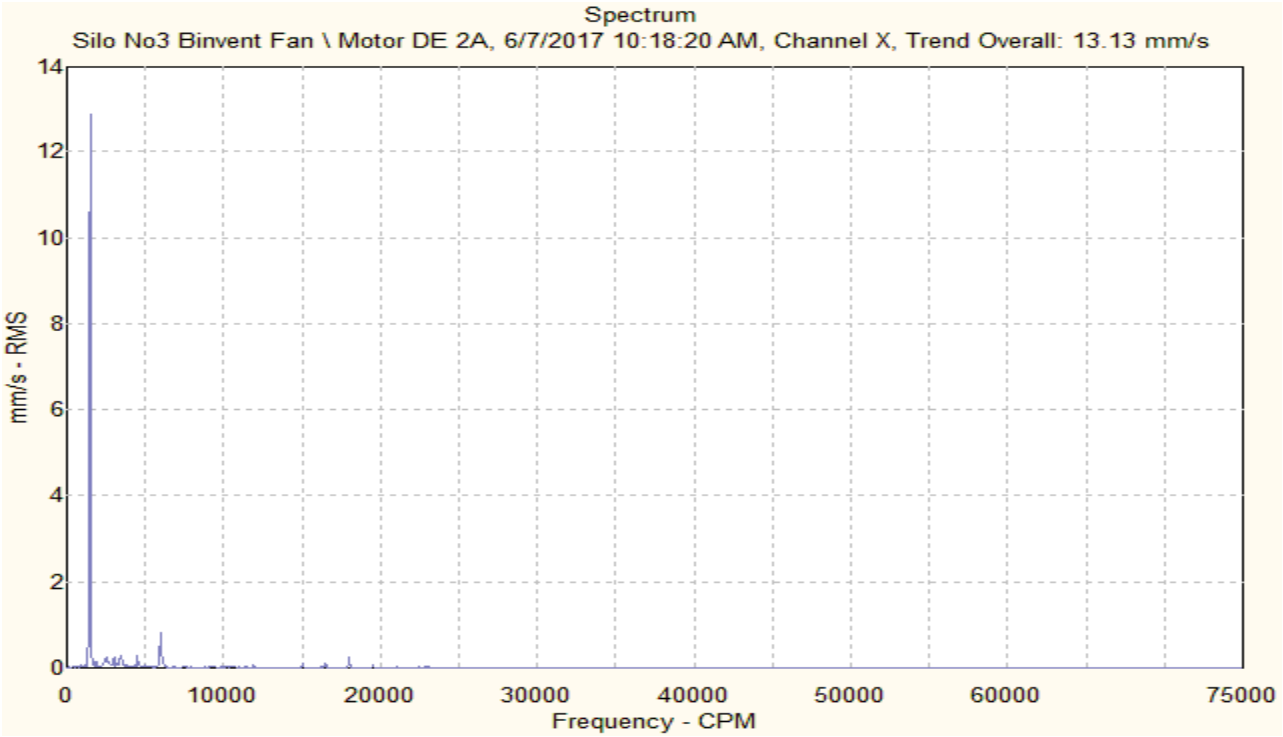
Source: Silo No3 Binvent Fan

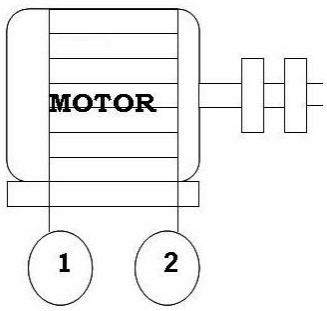
6/9/2017 5:30:32 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:16:49 AM	1.450	mm/s
Motor NDE 1HL	6/7/2017 10:16:56 AM	1.356	mm/s
Motor NDE HA	6/7/2017 10:16:59 AM	0.111	g
Motor NDE 1HgE3	6/7/2017 10:17:03 AM	0.704	gE
Motor NDE 1V	6/7/2017 10:17:20 AM	2.898	mm/s
Motor NDE 1A	6/7/2017 10:17:30 AM	9.782	mm/s
Motor DE 2H	6/7/2017 10:17:41 AM	2.546	mm/s
Motor DE HA	6/7/2017 10:17:44 AM	0.139	g
Motor DE 2HgE3	6/7/2017 10:17:48 AM	0.565	gE
Motor DE 2V	6/7/2017 10:18:10 AM	2.722	mm/s
Motor DE 2A	6/7/2017 10:18:20 AM	13.130	mm/s

Silo No3 Binvent Fan \ Motor DE 2A



Vibration Analysis Report 07.06.2017		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 (22.03.2016)	Present (07.06.2017)	
MOTOR	3.2	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 with slight increment in vibration trend.

ACTION PLAN:

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

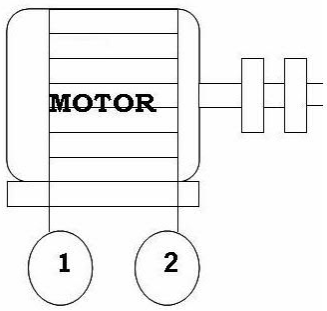
Last Measurement Report

Source: Silo No4 Binvent Fan

6/9/2017 5:31:06 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:14:56 AM	2.312	mm/s
Motor NDE 1HL	6/7/2017 10:15:04 AM	4.420	mm/s
Motor NDE HA	6/7/2017 10:15:07 AM	0.106	g
Motor NDE 1HgE3	6/7/2017 10:15:11 AM	0.486	gE
Motor NDE 1V	6/7/2017 10:15:23 AM	1.927	mm/s
Motor NDE 1A	6/7/2017 10:15:33 AM	2.738	mm/s
Motor DE 2H	6/7/2017 10:15:43 AM	2.403	mm/s
Motor DE HA	6/7/2017 10:15:46 AM	0.171	g
Motor DE 2HgE3	6/7/2017 10:15:50 AM	0.521	gE
Motor DE 2V	6/7/2017 10:16:02 AM	2.250	mm/s
Motor DE 2A	6/7/2017 10:16:12 AM	4.144	mm/s

Vibration Analysis Report 07.06.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	27	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 (22.03.2017)	Present (07.06.2017)	
MOTOR	3.2	4.6	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 4.6 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. Check motor base foundation bolts for rusting or improper rigidity.
2. Ok to run under trend monitoring following routine coating cleaning.

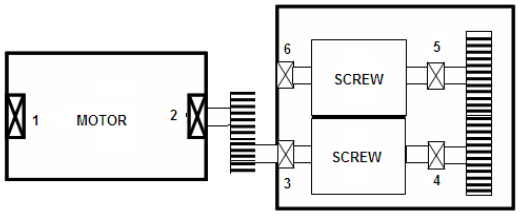
Last Measurement Report

Source: Silo No6 Binvent Fan

6/9/2017 5:31:34 PM

Last Measurement

POINT name	Date/Time	Last value	Units
Motor NDE 1H	6/7/2017 10:19:53 AM	1.305	mm/s
Motor NDE 1HL	6/7/2017 10:20:01 AM	1.235	mm/s
Motor NDE HA	6/7/2017 10:20:04 AM	0.103	g
Motor NDE 1HgE3	6/7/2017 10:20:08 AM	0.452	gE
Motor NDE 1V	6/7/2017 10:20:19 AM	1.096	mm/s
Motor NDE 1A	6/7/2017 10:20:27 AM	3.689	mm/s
Motor DE 2H	6/7/2017 10:20:36 AM	1.499	mm/s
Motor DE HA	6/7/2017 10:20:39 AM	0.079	g
Motor DE 2HgE3	6/7/2017 10:20:43 AM	0.239	gE
Motor DE 2V	6/7/2017 10:20:54 AM	2.371	mm/s
Motor DE 2A	6/7/2017 10:21:11 AM	4.561	mm/s

Vibration Analysis Report 07.06.2017		SKF RELIABILITY SYSTEMS	
EQUIPMENT S/NO.	28	EQUIPMENT NAME	COMPRESSOR - 1
MACHINE SKETCH		 SCREW COMPRESSOR	

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			At Ground	Y
Power Rating			On Rigid Concrete	N
Bearing No. (DE/NDE)			Above Ground Level	N
			On Vibro Pad	Y
Pulley Dia			On Steel Structure	Y

HIGHEST AMPLITUDES & HEALTH CONDITION			
LOCATION	VELOCITY (mm/sec) in rms		HEALTH CONDITION
	Previous (22.03.2016)	Present (07.06.2017)	
MOTOR	3.0 (8.5 gE)	3.1 (9.6 gE)	NORMAL
COMPRESSOR	6.0 (12.8 gE)	6.1 (12.8 gE)	NORMAL

OBSERVATIONS:

This equipment is indicating an "NORMAL" behavior with maximum vibration amplitudes of 6.1 mm/s recorded in the Compressor bearings.

ANALYSIS:

- The health condition of the equipment is in NORMAL range as per standards. Vibration data taken for the first time.

ACTION PLAN:

1. Trend monitoring is required to further comment on the machine health condition. Its is suggested to keep close monitoring over change in any parameter during routine physical observations.

Last Measurement Report

Source: Compressor-1

6/9/2017 5:32:05 PM

Last Measurement

POINT name	Date/Time	Last value	Units
MOTOR DE 2 HV	6/7/2017 11:46:50 AM	1.798	mm/s
MOTOR DE 2 HVH	6/7/2017 11:46:53 AM	2.058	mm/s
MOTOR DE 2 HA	6/7/2017 11:46:56 AM	3.262	g
MOTOR DE 2 HEA	6/7/2017 11:46:59 AM	9.653	gE
MOTOR DE 2 VV	6/7/2017 11:47:16 AM	3.109	mm/s
MOTOR DE 2 AV	6/7/2017 11:47:32 AM	1.978	mm/s
COMP LP DE 3 HV	6/7/2017 11:51:03 AM	2.399	mm/s
COMP LP DE 3 HVH	6/7/2017 11:51:06 AM	2.288	mm/s
COMP LP DE 3 HA	6/7/2017 11:51:09 AM	1.777	g
COMP LP DE 3 HEA	6/7/2017 11:51:12 AM	5.178	gE
COMP LP DE 3 VV	6/7/2017 11:51:24 AM	1.974	mm/s
COMP LP DE 3 AV	6/7/2017 11:51:44 AM	3.663	mm/s
COMP LP NDE 4 HV	6/7/2017 11:49:33 AM	4.397	mm/s
COMP LP NDE 4 HVH	6/7/2017 11:49:36 AM	4.913	mm/s
COMP LP NDE 4 HA	6/7/2017 11:49:39 AM	6.287	g
COMP LP NDE 4 HEA	6/7/2017 11:49:42 AM	12.550	gE
COMP LP NDE 4 VV	6/7/2017 11:50:08 AM	4.018	mm/s
COMP LP NDE 4 AV	6/7/2017 11:50:28 AM	3.346	mm/s
COMP HP NDE 6 HV	6/7/2017 11:47:59 AM	2.874	mm/s
COMP HP NDE 6 HVH	6/7/2017 11:48:02 AM	2.934	mm/s
COMP HP NDE 6 HA	6/7/2017 11:48:04 AM	2.295	g
COMP HP NDE 6 HEA	6/7/2017 11:48:08 AM	10.472	gE
COMP HP NDE 6 VV	6/7/2017 11:48:24 AM	6.108	mm/s
COMP HP NDE 6 AV	6/7/2017 11:48:54 AM	4.286	mm/s

IV. CONCLUSION

During the visit of our engineers to your site, on **07.06.2017**, 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	SILO-2 BINVENT FAN
2	SILO-3 BINVENT FAN

MACHINE CLASSIFIED UNDER ALERT CATEGORY

S.NO	EQUIPMENT NAME
1	COATING CIRCUIT BOOSTER FAN
2	COATING CIRCUIT MAIN AIR FAN
3	COATING FUGITIVE FAN
4	UN-COATING FUGITIVE FAN
5	HAMMER MILL RIGHT (DRIVE#1)
6	HAMMER MILL LEFT (DRIVE#2)
7	CLASSIFIER
8	DE-AGGLOMERATOR
9	CLASSIFIER AIR SLIDE FAN

MACHINE CLASSIFIED UNDER NORMAL CATEGORY

S.NO	EQUIPMENT NAME
1	HAMMER MILL DC FAN
2	GENERAL DC FAN
3	SELOX MAIN AIR FAN
4	UNCOATED TRANSFER BLOWER
5	COATED TRANSFER BLOWER
6	BALL MILL
7	BLENDER – HOUSING SIDE
8	BLENDER – DOOR SIDE
9	BLENDER AERATION BLOWER

10	PRODUCT SILO AERATION BLOWER
11	BALL MILL DISCHARGE BUCKET ELEVATOR
12	SILO FEED BUCKET ELEVATOR
13	SEAL AIR FAN
14	SILO-1 BINVENT FAN
15	SILO-4 BINVENT FAN
16	SILO-6 BINVENT FAN
17	COMPRESSOR - 1

for SKF India Limited