

# Vibration analysis Report

Date: 24/07/2025

## LINE-1 KILN STRING FAN (J1P13):

### Equipment details: -

|                         |                                  |
|-------------------------|----------------------------------|
| Equipment No            | KILN STRING FAN                  |
| Location                | L1 Kiln                          |
| Motor Capacity & Speed  | 1710 KW & 993                    |
| Motor bearing Details   | DE-NU230C3, NDE-NU224C3 + 6224C3 |
| Fan Bearing oil grade   | VG 68                            |
| Equipment Mounting Type | Rigid                            |

**Subject:** - On 03/12/2025, vibration measurements were conducted at the rated RPM of the aforementioned equipment. It was noted that the motor NDE acceleration levels exhibited noise.

| Tag no | J1P13-KILN STRING FAN         | Nov-24 | Dec-24 |
|--------|-------------------------------|--------|--------|
| 1H     | MOTOR NDE HORIZONTAL          | 0.634  | 0.860  |
| 1P     | MOTOR NDE PEAK VUE HORIZONTAL | 0.846  | 2.407  |
| 1V     | MOTOR NDE VERTICAL            | 0.332  | 0.641  |
| 1A     | MOTOR NDE AXIAL               | 0.368  | 0.385  |
| 2H     | MOTOR DE HORIZONTAL           | 0.838  | 0.938  |
| 2P     | MOTOR DE PEAK VUE HORIZONTAL  | 0.155  | 0.477  |
| 2V     | MOTOR DE VERTICAL             | 0.315  | 0.378  |
| 2A     | MOTOR DE AXIAL                | 0.235  | 0.403  |

### Observation & Recommendations:

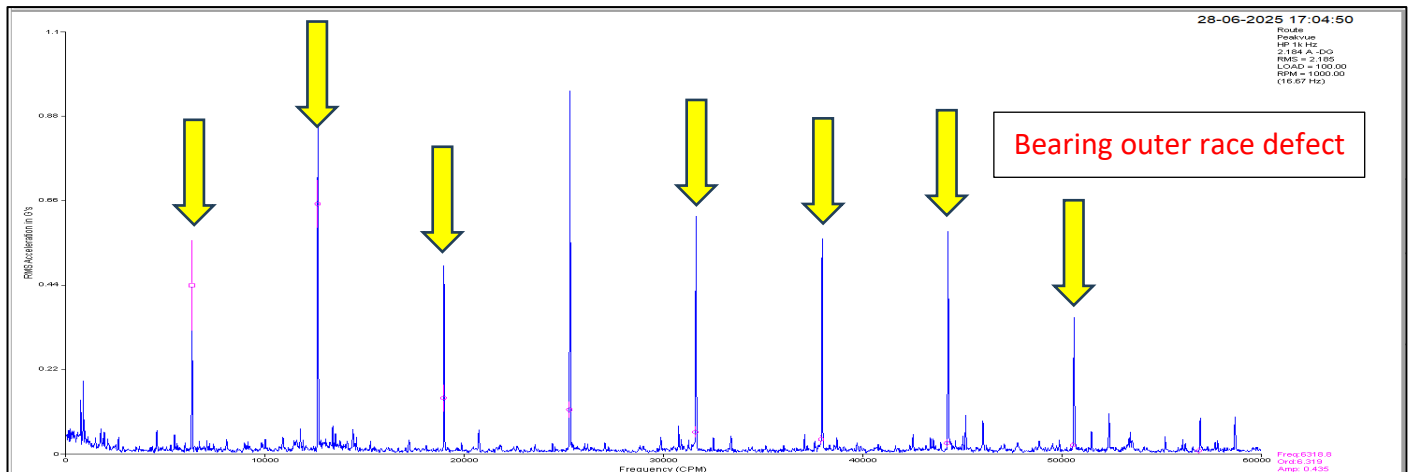
As a condition, We suggested to the concerned team to lubricate the motor NDE bearing, the value was reduced slightly after lubrication.

On 14/05/2025, the 'G' value increased again with heavy noise.

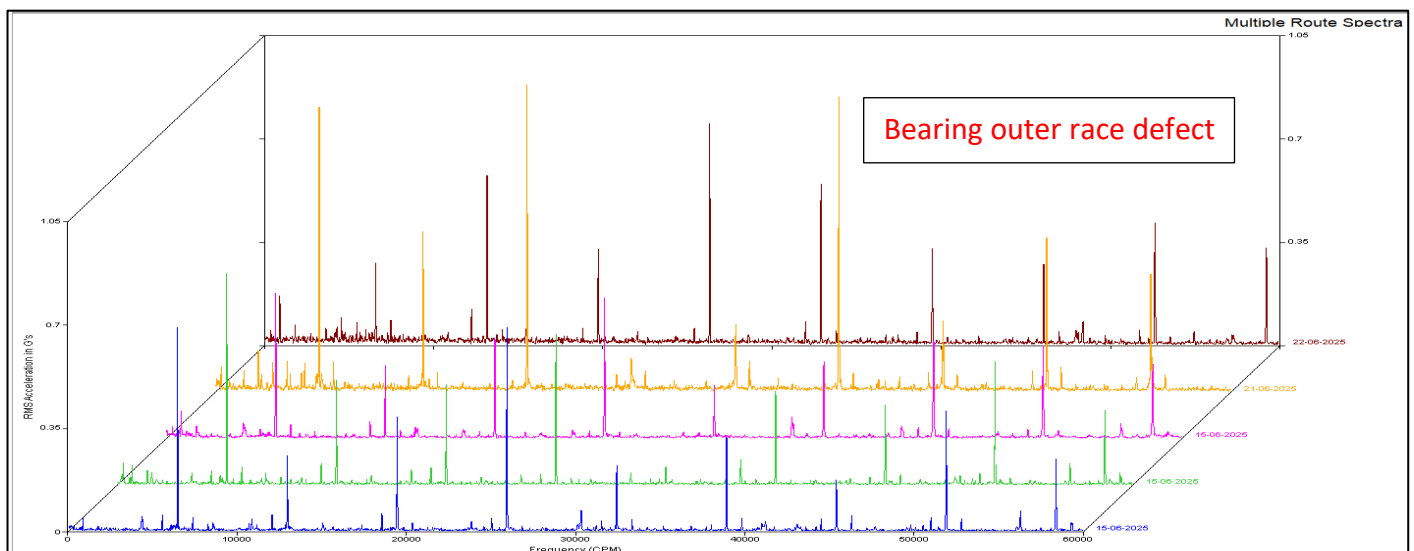
| Tag no | J1P13-KILN STRING FAN         | Nov-24 | Dec-24 | Mar-25 | May-25 | Jun-25 |
|--------|-------------------------------|--------|--------|--------|--------|--------|
| 1H     | MOTOR NDE HORIZONTAL          | 0.634  | 0.860  | 0.622  | 1.228  | 0.65   |
| 1P     | MOTOR NDE PEAK VUE HORIZONTAL | 0.846  | 2.407  | 0.984  | 1.859  | 1.305  |
| 1V     | MOTOR NDE VERTICAL            | 0.332  | 0.641  | 0.386  | 0.706  | 0.406  |
| 1A     | MOTOR NDE AXIAL               | 0.368  | 0.385  | 0.401  | 0.328  | 0.308  |
| 2H     | MOTOR DE HORIZONTAL           | 0.838  | 0.938  | 0.714  | 1.333  | 0.776  |
| 2P     | MOTOR DE PEAK VUE HORIZONTAL  | 0.155  | 0.477  | 0.477  | 0.19   | 0.204  |
| 2V     | MOTOR DE VERTICAL             | 0.315  | 0.378  | 0.66   | 0.489  | 0.28   |
| 2A     | MOTOR DE AXIAL                | 0.235  | 0.403  | 0.396  | 0.33   | 0.247  |

### Acceleration spectrum: -

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## Waterfall spectrum: -



## Analysis & Observations:

1. Consequently, it was recommended to lubricate the motor bearings. Following lubrication by the concerned team, a reduction in 'G' values was observed; however, these values increased again on 12/12/2025. The FFT shows BPFO symptoms on the motor NDE side, indicating bearing defects.
2. As part of the condition assessment, we performed an electrical leakage test on the motor and found electrical leakage at the motor NDE bearing.
3. The same bearing failed on 07/02/2025 due to the same cause. This is the second failure within a 5-month period.

## Recommendations:

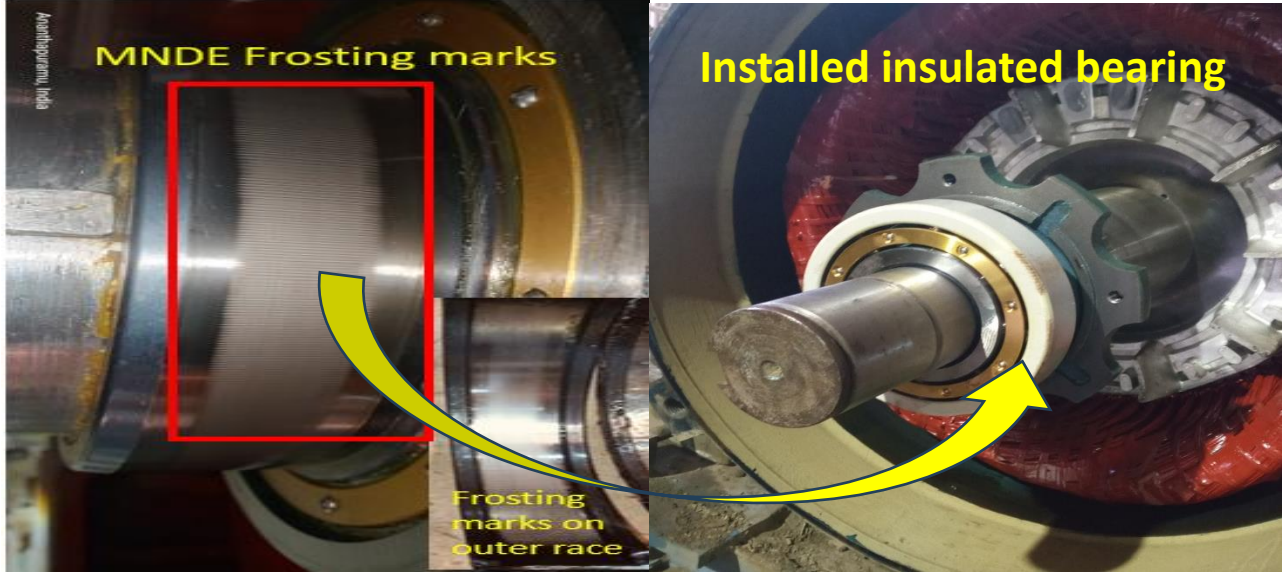
1. As the root cause has been finalized, we suggest the concerned team replace the bearing with an insulated motor NDE bearing. Until the replacement is carried out, kindly lubricate the motor NDE bearing to extend its life.

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2. Ensure that the fan coating is cleaned at the next available opportunity during a shutdown.

As per the vibration analysis report, the concerned team proceeded with the replacement of the motor NDE bearing on 09.07.2025.

### Effected bearings with installed bearing images :-

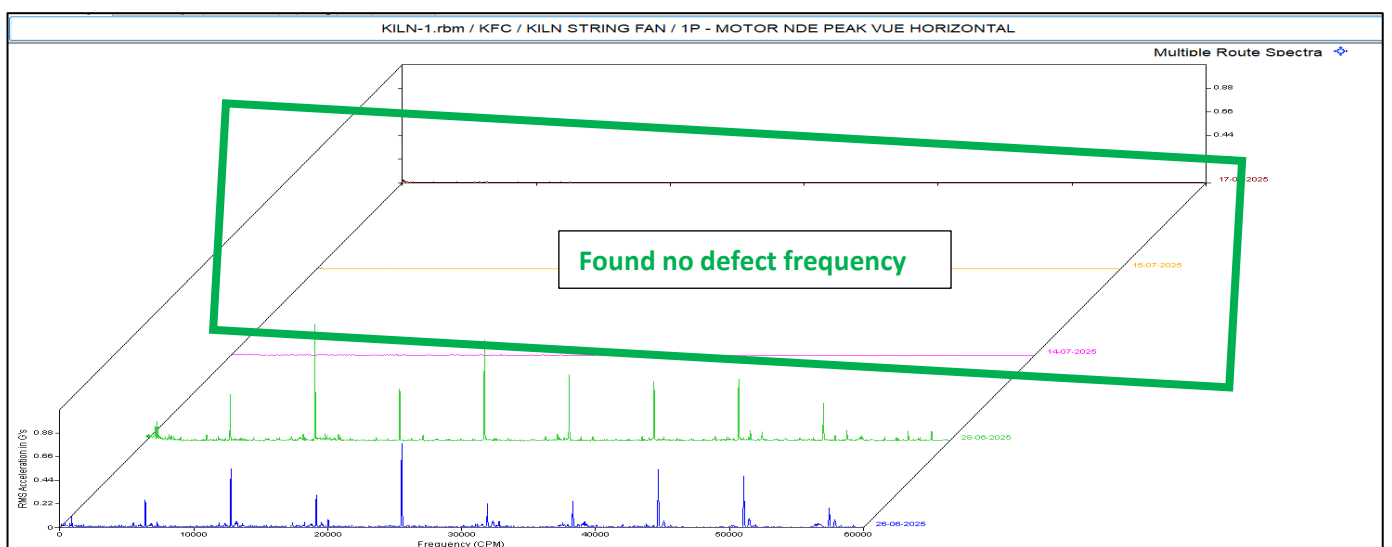
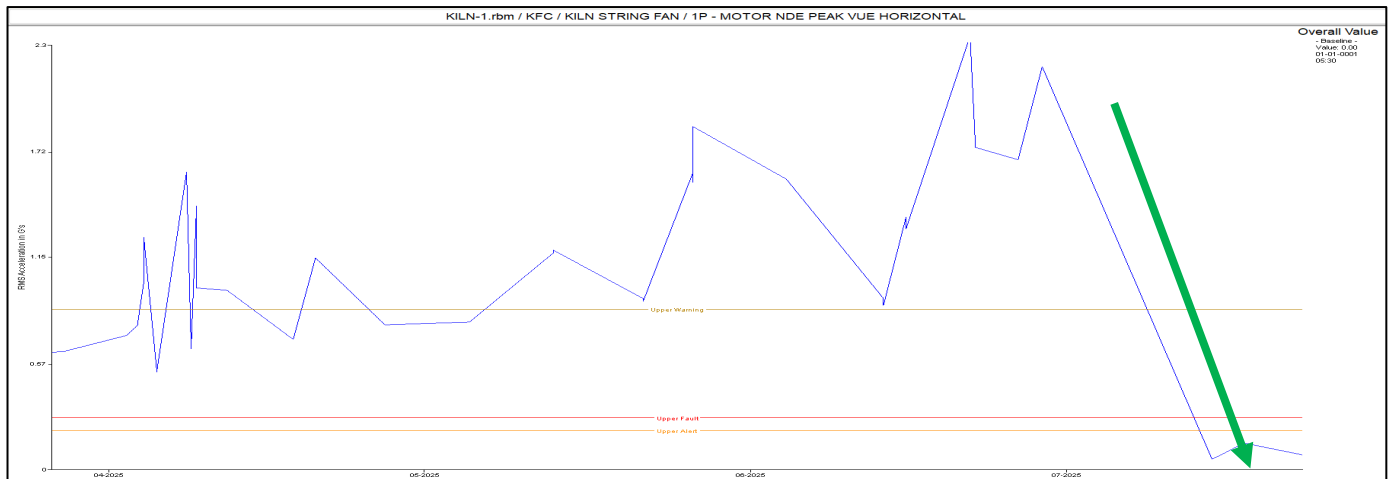


### Final vibration & Acceleration readings: -

| J1P13-KILN STRING FAN |                               | 15.06.25 | 21.06.25 | 22.06.25 | 26.06.25 | 28.06.25 | 15.07.25 |
|-----------------------|-------------------------------|----------|----------|----------|----------|----------|----------|
| 1H                    | MOTOR NDE HORIZONTAL          | 0.65     | 0.85     | 0.68     | 0.62     | 0.65     | 0.62     |
| 1P                    | MOTOR NDE PEAK VUE HORIZONTAL | 1.31     | 2.35     | 1.75     | 1.68     | 2.18     | 0.07     |
| 1V                    | MOTOR NDE VERTICAL            | 0.41     | 0.48     | 0.50     | 0.39     | 0.45     | 0.41     |
| 1A                    | MOTOR NDE AXIAL               | 0.31     | 0.51     | 0.40     | 0.49     | 0.70     | 0.33     |
| 2H                    | MOTOR DE HORIZONTAL           | 0.78     | 1.09     | 0.91     | 0.80     | 0.77     | 0.70     |
| 2P                    | MOTOR DE PEAK VUE HORIZONTAL  | 0.20     | 0.29     | 0.74     | 0.30     | 0.41     | 0.19     |
| 2V                    | MOTOR DE VERTICAL             | 0.28     | 0.51     | 0.40     | 0.41     | 0.67     | 0.35     |
| 2A                    | MOTOR DE AXIAL                | 0.25     | 0.46     | 0.41     | 0.32     | 0.70     | 0.26     |
| 3H                    | FAN DE HORIZONTAL             | 2.44     | 0.76     | 1.13     | 0.79     | *        | 0.73     |
| 3P                    | FAN DE PEAK VUE HORIZONTAL    | 0.04     | 0.04     | 0.06     | 0.04     | *        | 0.03     |
| 3V                    | FAN DE VERTICAL               | 0.81     | 1.03     | 0.63     | 0.52     | *        | 0.36     |
| 3A                    | FAN DE AXIAL                  | 1.68     | 1.91     | 2.41     | 2.31     | *        | 1.21     |
| 4H                    | FAN NDE HORIZONTAL            | 1.96     | 0.72     | 0.85     | 0.65     | *        | 0.61     |
| 4P                    | FAN NDE PEAK VUE HORIZONTAL   | 0.09     | 0.09     | 0.08     | 0.11     | *        | 0.06     |
| 4V                    | FAN NDE VERTICAL              | 0.48     | 0.40     | 0.26     | 0.29     | *        | 0.36     |
| 4A                    | FAN NDE AXIAL                 | 1.52     | 1.29     | 0.77     | 1.19     | *        | 1.40     |

### Acceleration spectrum: - @After rectification graph

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**Root cause:** Electrical leakage at the motor NDE bearing resulted in two failures span of 5 months

## Action plan & Key improvements:

1. The motor NDE side bearing replacement has been completed, changing from a normal to an insulated bearing.
2. The fan impeller coating has been cleaned.

**Benefits:** As a preventive measure, avoided repeated bearing failures with improved the equipment reliability.

**\*\*We extend our sincere gratitude to the concerned team for their invaluable support\*\***