

SITE REPORT



ABSTRACT

This Report contains Vibration readings taken on Gas driven engine & alternator. Vibration measured in three mutually perpendicular directions i.e., in Horizontal Vertical and Axial direction and these readings were measured in No-Load & 100%load Condition.

The overall value Velocity (RMS) and the frequency spectra's over a bandwidth of 1 Hz to 1100 Hz were measured.

VIBRATION STANDARD

SOURCES OF VIBRATION

Typical sources of vibration produced within the alternator can be attributed to rotating system imbalance, misalignment and fan blade pass frequency. These translate into linear vibrations in the x (longitudinal), y (vertical) and z (transverse) directions. Table 1 shows the linear vibration level limits recommended for alternators in ISO 8528-9.

Engine Speed RPM (min ⁻¹)	Power Output S (kVA)	Vibration Displacement RMS (mm)	Vibration Velocity RMS (mm/s)	Vibration Acceleration RMS (mm/s ²)
1300 ≤ RPM ≤ 2000	250 < S	0.32	20	13
720 ≤ RPM < 1300	250 < S ≤ 1250	0.32	20	13
	1250 < S	0.29	18	11
The broad band is taken as 10 Hz - 1000 Hz				

Table 1: ISO standard recommendations for linear vibrations.

Equipment Tag:

Machine Specification	Gas Generator Set
Capacity	1120 KW/1400 KVA
RPM	1800

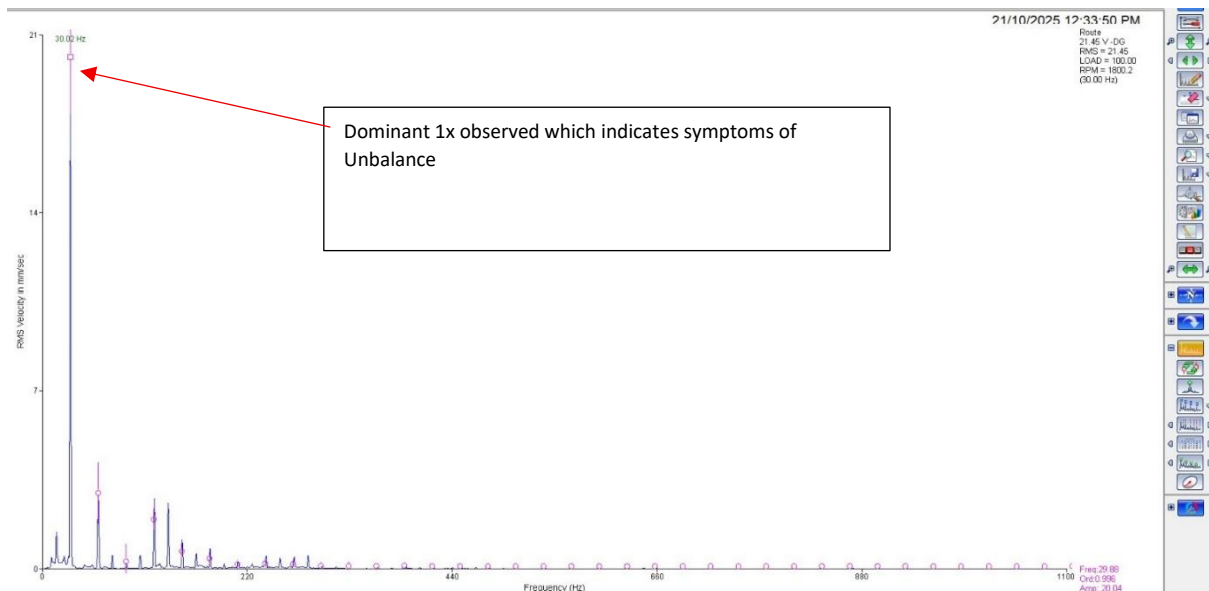
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Vibration Data on No-Load Condition at 1800 RPM Before Trim Balancing

LOCATION	H	V	A
GEN-DE	7.4 mm/s	16.93 mm/s	9.33 mm/s
GEN-NDE	19.57 mm/s	31.25 mm/s	12.81 mm/s
ENGINE-DE	9.08 mm/s	20.06 mm/s	5.43 mm/s
EIGINE-NDE	8.3 mm/s	12.82 mm/s	9.53 mm/s

Velocity Spectrum at Generator NDE in Vertical direction Before trim balancing :



Gen NDE Phase angle (H-V) was found to be approximately 106.4°

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Summary :

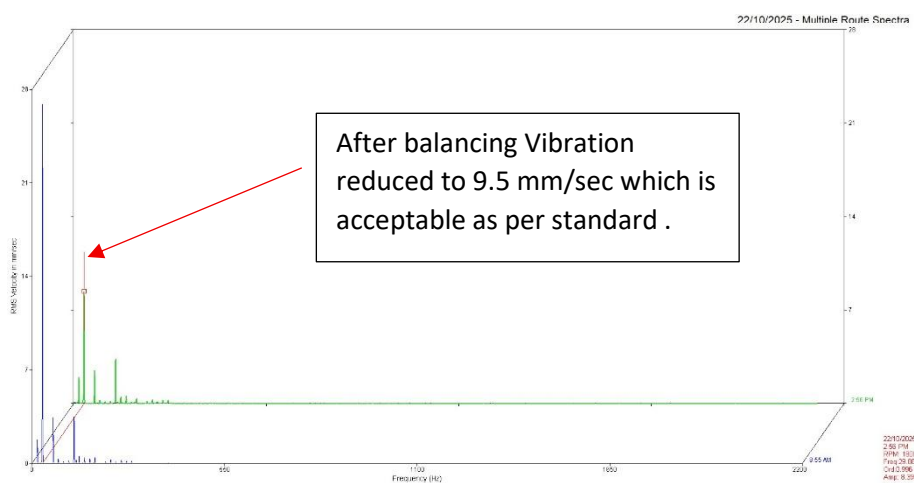
This generator was received in the workshop for a vibration test. The test was conducted at no load, and the vibration levels were found to be normal, below 1.5 mm/sec. However, when the generator was coupled with the engine at site, very high vibration levels were observed in all directions, with the maximum recorded on the generator NDE side in the vertical direction. The engine side vibration was also high, around 20 mm/sec.

Phase analysis was carried out, which indicated an unbalance issue, as the generator nde side phase angle (H-V) was found to be approximately 101.5°. Balancing was then performed by adding correction weights 300 gms on the DE side external fan. After balancing, the vibration levels were reduced from 28 mm/sec to 9.5 mm/sec, which is within the acceptable limit as per the relevant standard.

Vibration Data on No-Load Condition at 1800 RPM After Trim Balancing

LOCATION	H	V	A
GEN-DE	6.5 mm/s	7.8 mm/s	4.5 mm/s
GEN-NDE	8.9 mm/s	9.5 mm/s	5.7 mm/s
ENGINE-DE	6.5 mm/s	8.0 mm/s	5.9 mm/s
EIGINE-NDE	7.8 mm/s	7.2 mm/s	5.5 mm/s

Waterfall plot at Generator NDE in Vertical direction After trim balancing :



Around 300 gms weight added

Reported By
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