

TITLE

Sales Gas Stage 1 Compressor Skid Motion Amplification Study, South Shelby RNG Memphis, TN

1: Executive Summary

Hi-Speed Industrial Service was called in to use its Motion Amplification Technology to inspect the Sales Gas Stage 1 at South Shelby RNG in Memphis. TN. Vibration data of this unit does show some elevated 1 x rpm vibration in the vertical position. Therefore, Motion Amplification was used to help determine where and how much the motor/compressor base is flexing.

2: Methodology of Data Acquisition

Video was taken at side view in this case because most of the structural vibration is at the X and Y axis in this field of view. X being axial and Y being vertical.

3: Data Analysis & Results

Click on picture to open video link (may need to change quality to 1080p in video settings)



Sales Gas Stage 1 Compressor

Figure 1: Motion Amplification, Side view Motor/Compressor



Figure 2: Motion Amplification, Side view Compressor



Figure 3: Vibration Data, Compressor Baseplate-Skid Baseplate



Figure 4: Motion Amplification, Sales Gas Stage 1 Compressor End View

We also took a quick video of Sales Gas Stage 2 after we were done with Stage 1. See below.



Figure 5: Motion Amplification, Sales Gas Stage 2 Piping, Filter housing, part of compressor



Figure 6: Vibration Data, Bottom of Filter Housing

4: Conclusion(s) and Recommended Corrective Action(s)

Motion amplification video of Sales Gas Stage 1 shows some movement especially under the compressor. This issue does not seem to be as severe as the Feed Compressors, likely because this compressor is smaller by design. It is still recommended to perform the modifications as planned. This will help alleviate unwanted forcing frequencies of vibration.

We also shot some video of Sales Gas Stage 2. We already know there is movement in several components of this unit, but MA video really shows this well. Basically, everything is vibrating at 1 x and/or 2 x compressor rpm. A ROI (region of interest) was drawn at the bottom of the filter assembly to collect vibration data from the image. Spectral amplitude shows nearly 1,0 ips-pk vibration in the x (horizontal axis) and Y (vertical axis).

We suspect some resonance is occurring in this unit. Further vibration analysis and perhaps Motion Amplification should be performed with the compressor operating at different rpms.

This concludes our assessment of the Feed Gas Compressors Motion Amplification Study at South Shelby RNG. Please feel free to contact us for any questions or comments. Regards, Kevin W. Maxwell Certified Motion Amplification Videographer MA Certification # RDI190108E <u>kwilliam@gohispeed.com</u> (901) 486-4565



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