



**QualiTest® Diagnostics**

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October 29, 2024

NUCOR Melt Shop

Subject: October 2024 vibration survey

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Below is a summary report for the Melt Shop monthly vibration survey that was performed on 10/23/24. Most of the machines surveyed were found to be in good condition except for the following:

**QualiTest®** uses a four-step rating system for defects.

**Class I:** Defect is present, but effect on reliability is not clear; no immediate action is required. Continue to normally monitor.

**Class II:** Defect (s) present that may cause problem in long term (2-6 months). Repair during normal maintenance scheduling. Continue to monitor.

**Class III:** Defect (s) present that may cause failure in short term (less than 2 months). This should be addressed as soon as practical, with a high maintenance priority. Increase monitoring frequency.

**Class IV:** Defect (s) present that makes continued reliability unpredictable, and possibility of secondary damage is high. Repairs should be made ASAP. An unscheduled shutdown should be considered for repairs

**Hi-Speed Industrial Service** tests and inspects industrial machinery and equipment and makes recommendations concerning maintenance and repairs based on its experience in the field of industrial repair and maintenance. The information contained herein is provided as an opinion only, not as a guaranty or warranty of the matters discussed herein.

As always, it has been a pleasure to serve NUCOR Steel Flowood-Jackson, MS. If there are any comments or questions, do not hesitate to contact us.

Sincerely,

ISO Certified Vibration Analyst, Category III



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## **Defects**

### **Middle Caster Mold Water Pump**

***Pump was down this survey; however, the following still applies:*** Vibration data shows issues in the pump. Data suggests looseness/wear of the pump bearings/fits. Impeller and other pump internals may also have wear. The pump will likely need attention soon. Rated as a **CLASS II** defect.

### **East Booster Pump**

***Pump was down this survey; however, the following still applies if no actions have been taken:*** Motor vibration data indicates defects are present in the motor bearings. Inspect motor as scheduling allows. Rated as a **CLASS II** defect.

### **East Servo Hyd. Pump**

***Pump was down this survey; however, the following still applies if no actions have been taken:*** Pump vibration data shows quite a bit of hydraulic vane pass frequency and rpm sidebands surrounding these peaks. This is usually due to pump wear but may also be influenced by excessive loading and unloading of the pump. For now, ensure pump has proper flows and is operating properly. Rated as a **CLASS II** defect.

### **Middle 2<sup>nd</sup> Deck Hyd. Pump**

***Pump was down this survey; however, the following likely still applies if no actions have been taken:*** Overall amplitude is slightly lower but still high. The presence of vane harmonics and high acceleration amplitude in the pump suggests a flow issue. Ensure pump is operating at normal flow. Unit still has a high 1 x rpm vibration. Rated as a **CLASS II** defect.

### **South 2<sup>nd</sup> Deck Hyd. Pump**

Spectral data of the pump shows harmonics of hydraulic vane frequency. This may be due to internal pump wear and or flow issue. Rated as a **CLASS II** defect.

### **Cooling Tower #3 Supply Pump**

Coupling guard was missing. Guard should be installed if it hasn't been already.

### **Cooling Tower #4 Supply Pump**

Pump data shows some signs of bearing defects/wear in the ODE pump bearing. Inspect pump as scheduling allows. Rated as a **CLASS III** defect.

### **Cooling Tower #5 Supply Pump**

***Pump was down this survey; however, the following likely still applies:*** Pump has some increased 1 x rpm axial vibration. For now, it is recommended to inspect couplings, alignment, and all pump fasteners as scheduling allows. Rated as a **CLASS II** defect.

### **Cooling Tower #6 Supply Pump**

The pump vibration data still indicates that there is bearing wear, and possibly cavitation in the pump. Inspect ODE pump bearing. Ensure the pump has no inlet restrictions and is operating in the correct part of the curve. Impeller may have excessive wear. Rated as a **CLASS II** defect.

### **West Furnace Baghouse Fan**

Data still shows a 2 x rpm vibration in the motor. This usually is an indication of an alignment and or coupling issue. Vibration is not at an alarm level yet, so this is a **CLASS I** defect.

### **Spray Chamber Exhaust Fan**

Motor and fan both have increased vibration again this survey. Belts could be slipping which is allowing the motor to operate at speeds near a resonance which causing high 1 x fan rpm vibration in the unit. High 1 x rpm vibration could also be structural issue and or fan imbalance. Inspect all motor base mounts/fasteners. Inspect fan for build-up and inspect belt tension soon. Rated as a **CLASS III** defect.