

## *TECH TIDBITS, vol. 15*

### Vibration and Variable Frequency Drives

Recent work by WEST Engineering Services on offshore rigs has identified an issue with certain variable frequency drives (VFDs). Two new-model VFD drives failed back-to-back within a couple of weeks of installation when older drives in the same position had no history of problems. The problem appears to be related to vibration affecting cable connections on the drives.

The PRSs (Pipe Racking Systems) using these types of drives are in common use on a number of rigs worldwide. This could affect operations for all who use these new drives if they have a vibration issue in their control cabinets. The manufacturer has been notified but as of the date of this printing, no recommendation or fix has been identified.

#### **Description of Issue**

An under-voltage problem was seen on two new-style series drives installed on the slew and upper arm drives for the PRS. Both drives worked well for a few weeks before the voltage would drop 30 to 60 volts while running or not running. When torque or amperage was increased, the voltage would lower to the point it tripped the drive off line.

While troubleshooting, it was noticed that the carriage that held the drive's controller card had movement and was not stable. On one side, the carriage is mounted to a bracket while the printed circuit board is mounted on the other side of the carriage. During inspection, manually pushing on the carriage returned the voltage to a full 687 dcv. This was the same voltage as the other, working drives. When pressure was removed, the voltage dropped back to 30-60dcv under 687dcv.

As an experiment, a small cardboard wedge was installed to push the carriage over enough to restore the voltage to 687dcv. This temporary adjustment was tested for a full day and night. Further investigation seemed to indicate that the problem developed when vibration in the cabinets caused the ribbon cable plugged into the card to loosen and lower the voltage.

#### **Solution**

Until a manufacturer fix is identified, it is recommended that connections such as ribbon cables be fixed in place with small dots or dabs of dielectric epoxy on the outside of the connector. Similar non-conductive, electronics-compatible adhesive would also work. Using only a small amount of adhesive will allow the connection to be removed when needed.

For more information or technical questions, please contact WEST Engineering, [west@westengineer.com](mailto:west@westengineer.com), or call 281-375-5515, or visit our website at [www.westengineer.com](http://www.westengineer.com).