

## **Code 971 Helps Develop Conveyor Automatic Chain Oiler**

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The process of oiling drive and carrier chains is an extremely time consuming and labor intensive operation, but is vital to proper conveyor chain operation. Improperly lubricated chains shorten their operational availability, as well as that of the motor and associated rotating equipment. A four-person team spent approximately eight hours manually oiling one chain.

The in-service engineer/lifecycle manager (ISE/LCM) for conveyors and the Aircraft, Vehicle, Ship and Material Handling Branch (Code 971) NSWCCD-SSES, worked with the technical warrant holder (TWH) at COMNAVAIRLANT, and the technical community at large, to design an automatic chain oiler. The automatic oiler is a self-contained, air-pressurized system that automatically oils the chains monthly or based on operational hours. Oiling happens during normal operations without the need for maintenance personnel, or the removal and re-installation of the safety shields/guards. The automatic oiler ensures there are properly lubricated chains at all times. Additionally, personnel no longer handle hazardous materials.

Prior to the automatic chain oiler installation, properly oiling the chains required personnel to run the tag-out procedure, gain access to the chains/machinery (both at the top and bottom levels with two people per chain), oil the accessible length of chain, exit the conveyor, perform the tag-in procedure and rotate the conveyor one tray spacing to bring the next section of chain into the accessible area. This process is repeated and takes four people approximately eight hours to complete. The oiling is done twice per year, which equates to 64 hours of labor per conveyor, per year. There are 11 active conveyors on a CVN 68 class aircraft carrier. This takes about 700 hours of work, at approximately \$60 per hour. The total cost per carrier is approximately \$42,000 per year, or \$380,000 for the entire CVN 68 class.

In addition, personnel must remove portions of the safety shields/guards throughout the conveyor and then properly reinstall them upon completion, which adds to the time commitment. Additionally, the removal of the safety shields/guards can result in their loss, damage or improper reinstallation. Shields/guards not properly reinstalled allows for the possibility of a conveyor jam resulting in cascading damage to the shields/guards, moving components of the conveyor, product being transported, and/or injury to personnel.

3M and COMNAVAIRLANT identified with data that an additional \$300,000 per year, per aircraft carrier was spent for repair labor, material/parts, and increased working parties (to manually move material through the ship) due to the failures of the conveyor associated with the carrier and drive chains failures.

Installation of the automatic oilers has total cost avoidances per year, for the CVN68 Class, of approximately \$380,000 in labor. Feedback from the technical community confirms that chain lubrication has never been better, and chain corrosion reduced drastically. Since the installations began in 2002, there have been no instances of conveyor chain related casualties or cascading damage to a conveyor system. This could result in an additional \$300,000 savings per year, per aircraft carrier.