

## GENERAL MAINTENANCE INFORMATION

### GENERAL:

An inspection, lubrication and maintenance program should be implemented for all overhead cranes, hoists and other types of lifting equipment. The program in part involves the establishment of written schedules and procedures to perform various tasks as required by

### OSHA, ASME:

(American Society of Mechanical Engineers) and the equipment manufacturer. These schedules and programs should be followed carefully to prevent minor defects that could lead to dangerous conditions. Proper documentation should also be carefully monitored, as OSHA requires it. Consistent, thorough and accurate record keeping will also help reduce overall maintenance costs and prevent shutdowns by forewarning or pointing out serious problems. Minor adjustments, cleaning and parts replacements will also maintain peak efficiency of your equipment.

To determine a program to meet the requirements of particular piece of equipment is difficult due to numerous variable factors such as material handled, application, local atmospheric conditions, mode of operation, load, duty cycle, etc. Each unit will dictate its own requirement.

Some of these recommendations are based on a 40-hour work week; however, these recommendations may merit adjustments if they are affected by the aforementioned variables.

In determining the required actions to produce an equipment schedule, your equipment will fall into one of the following three categories as defined by ASME B-30.2:

1. **NORMAL SERVICE** – service that involves operating at less than 85% of rated load capacity and not more than 10 cycles/hour except for isolated instances.
2. **HEAVY SERVICE** – service that involves operating at 85% to 100% of rated load capacity or in excess of 10 cycle/hour as a regular procedure.
3. **SEVERE SERVICE** – service that involves normal or heavy service with abnormal operating conditions, such as environmental, high or low ambient temperatures, exposure to weather, corrosive fumes, dust, moisture, etc.

### INSPECTIONS:

One of the important aspects of any program is the performing of inspections as required by OSHA and ASME standards. The number of inspections required per year can easily vary from unit to unit. OSHA and ASME have established guidelines to help determine your number of inspections.

Daily **pre-operational checks** are required to ensure the proper function of equipment. This is normally the responsibility of the equipment operator on a daily or shift basis.

Inspection procedure for equipment in regular service is divided into two general classifications based upon the intervals at which these inspections should be performed. The intervals in turn are dependent upon the nature of the critical components of the equipment and the degree of the exposure to wear, deterioration or malfunction. The two general classifications are designated as **frequent and periodic** with respective intervals between inspections as defined below.

### **FREQUENT INSPECTION:**

This involves visual and functional analysis of the equipment. Check lists are followed and documentation provides a means of keeping accurate records as to the nature of any findings. Inspections should be conducted to meet the following criteria:

- (a) normal service – monthly
- (b) heavy service – weekly to monthly
- (c) severe service – daily to weekly

### **PERIODIC INSPECTION:**

This involves a more in depth analysis of the equipment. Again, check lists are followed with documentation providing a means of keeping accurate records as to the nature of any findings. Inspections should be conducted to meet the following criteria:

- (a) normal service – yearly
- (b) heavy service – semi-annual
- (c) severe service – quarterly

The documented results of frequent and periodic inspections are a valuable tool. Obviously if safety related deficiencies are discovered, this information will appear on the reports along with recommendations as to solutions to the problem. As required by OSHA, **safety related deficiencies must be remedied before operation of the unit is resumed.** The convenience of having common wear parts and materials on hand during the inspections could reduce the amount of potential equipment down time.

Plant personnel as required should perform pre-operational checks per start of each shift.

### **WIRE ROPE, CHAIN, HOOK DATA TRACKING:**

This data is extremely valuable in helping to determine any wear on these items. As a wire rope bends over sheaves and drums the internal wires continually rub against each other. All wires constantly wear and grind against each other inducing friction that will ultimately cause a wire rope to lose diameter and thus holding power. Chain links can also lose their holding power by wearing or stretching. Stretch can be determined by comparing the non-load-holding portion of the chain, to the holding portion. Proper lubrication of wire ropes and chains is an important aspect also. Hooks can also become deformed over time. OSHA requires that wire rope, chain and hook data be gathered at on going and consistent intervals determined by the severity of service and any abnormal conditions that might affect it.

### **PREVENTIVE MAINTENANCE:**

Virtually all equipment manufacturers have their own requirements for scheduled preventive maintenance. With this in mind, it is extremely beneficial to maintain a copy of your Maintenance and Operation Manuals. These will aid in recommending a preventive maintenance schedule. Adhering to the requirements of the manufacturer is extremely important. The inspection & maintenance program allows for equipment care and minor adjustments.

### **LUBRICATION:**

As with preventive maintenance scheduling, equipment manufacturers have their own requirements as to lubrication points and levels, lubrication frequency and types of lubrication used. Again it would be beneficial to refer to your Maintenance and Operation Manuals for your equipment to aid in determining a lubrication schedule. Adhering to this schedule and the manufacturer requirements, along with lubrication of wire ropes and chains is important.

**FORMS PROVIDED:**

Pre-Operation Checklist  
Periodic Inspection Report

Frequent Inspection Report  
Deficiency Report

Magna-Flux Report