

## *Dynamic balancing of the cooling tower fan*



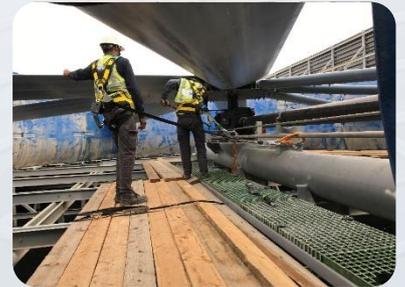
### **General**

The purpose of a cooling tower is removal of excess heat from water used in industrial processes to cool various systems. Removal of the heat from the water is done carried out by the flow of the water counter (or across) to an air flow. The air flow is produced by the fan which is driven by the motor, either in direct drive or by gear (speed reducer).

In a revolving system, the center of mass of the revolving body may deviates to a certain degree from the axis, and as a result, centrifugal force is produced that impairs balance. The imbalance produces vibrations that damage the bearings, the seals, the axis, and can ultimately lead to catastrophic failure of the system. A failure of the mechanical system causes a shutdown of the entire cooling tower.

### **There are several causes of imbalance in the revolving system:**

- Incorrect assembly of the system components
- Improper alignment
- Accumulation of dirt (salts, mineral buildup)
- Wearing down of materials
- Change of the fan's blades angle



### **How to identify imbalance**

- Vibration sensor / vibration cutoff switch installed on the revolving system
- Irregular vibration in the fan housing and in the tower overall
- Irregular noise from the area of the fan housing

### **Advantages for revolving system balancing**

- Reduction in replacement parts and maintenance costs (bearings, seals, axes)
- Reduces risk of a total system malfunction

### **Balancing methods**

Balancing is executed by adding weights onto the fan blades of a specific weight at a defined location

#### **Dynamic balancing**

By, using a laser-based, mobile computerized system, a high level of precision can be attained without the need to dismantle and re-assemble the fan, thereby eliminating the cost of dismantling and shipping the fan, in turn significantly cutting down on the tower's downtime.

#### **Static balancing**

the balancing is done on a dedicated device at the cooling tower manufacturer's plant.