Condition Monitoring
(optional)
**Condition Monitoring**

Condition Monitoring is taken to mean the use of advanced technologies in order to determine equipment condition, and potentially predict failure. It includes, but is not limited to, technologies such as:

- Vibration Measurement and Analysis
- Infrared Thermography
- Oil Analysis and Tribology
- Ultrasonics
- Motor Current Analysis

Condition Monitoring is most frequently used as a Predictive or Condition-Based Maintenance technique.

There are other Predictive Maintenance techniques that can also be used, including the use of the Human Senses (look, listen, feel, smell etc.), Machine Performance Monitoring, and Statistical Process Control techniques.
Condition monitoring of Reciprocating Air Compressors

Monitoring operating data (i.e. pressures, temps, etc.).
Monitoring lubricating oil sample periodically
Vibration monitoring data- any deviation from baseline is an indicator of an anomaly that should be investigated.

The monitoring involved those critical components that are unique to each machine depending on the type, stages, fluids, and other characteristics. Some of the critical monitoring parameters to any reciprocating compressors are:

1. **The discharge temperature** on each discharge valve. This is probably the most important diagnostic indicator, indicating not only the condition of a discharge valve, but also is an excellent indicator of how the piston rings on a double-acting cylinder are sealing. When ring wear starts to become a factor, the discharge temperature starts to climb due to internal by-passing of the rings and subsequent re-compression of hot gas in the cylinder.

   Paint compressors with paint on the discharge valve covers that would char or burn at temperatures exceeding 300 oF. Since specified maximum discharge temperatures of 275 oF for all reciprocating stages, a faulty, over-heated valve can be spotted.

2. **The suction valve temperature**; this indicates the leakage of the seats on the valve. Sometimes it is opted for not monitoring this (because of expense). This method would immediately alert an operator of a leaking suction valve.

3. **Compressor frame vibration**; this is an attempt to spot any bearing wear and knocking. Depending on the design, you still may have to contend with babbitted bearings and crosshead tolerances that are subject to normal mechanical wear and tear.

   The above items - valves, rings, bearings - have always been the main items of concern in any reciprocating application. There are other items that must be considered, of course, such as oil lubrication.