Module 1:

Nature of Chronic Losses
The Problem of ChronicLoss

Why does chronic losses persist?
- Failure to understand the nature of chronic loss
- Using ineffective approaches in dealing with chronic losses

Chronic vs Sporadic Losses

Sporadic
- Indicate sudden often large deviations from the norm
- They result from a single cause that is relatively easy to identify
- Since root cause is often a single cause corrective measures are easy to formulate and easy to correct
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>SPORADIC</th>
<th>CHRONIC</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>• Occur suddenly and infrequently, large deviations from the norm</td>
<td>• Smaller, frequent deviation, resist variety of corrective measures</td>
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<td></td>
<td></td>
<td>• Includes 1-5% of the problem</td>
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<tr>
<td>Cause</td>
<td>• Single cause, problem is easy to identify</td>
<td>• Complex, tangled cause and effect relationship, difficult both to identify causes and clarify effect.</td>
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<tr>
<td>Countermeasure</td>
<td>• Restore to return to its previous level</td>
<td>• Requires innovative breakthrough measures, that restore the mechanism or component to its original, defect-free state.</td>
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<tr>
<td>Approach</td>
<td>• Cause and Effect • Pareto Diagram</td>
<td>• P-M Analysis</td>
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</table>
Chronic vs Sporadic Losses

- **Chronic Loss**
  - Chronic losses become obvious when compared with optimal conditions
  - Required innovation (corrective and improvement measures) to lower down the chronic loss rate
  - Chronic losses become obvious when compared with optimal conditions

- **Sporadic Loss**
  - Requires restoration to return to previous level
  - Large deviations from the norm

![Chart showing chronic versus sporadic losses over time](chart.png)
The Nature of Chronic Loss

**Case 1**
- Cause A
  - A bearing seizes due to wear and tear. Bearing was replaced and problem was solved

**Case 2**
- Cause A
- Cause B
- Cause C
  - One of multiple varying cause

**Case 3**
- Cause A
- Cause B
- Cause C
- Cause D
  - Varying complex combinations
  - Each time the problem occurs a different combination of causes. Today it may be cause A, B tomorrow A, C, G and H

**Difficulty in pinpointing causes**

Even when measures taken against a single targeted cause are effective, the improvement is often temporary, hence the problem will resurface since we failed to eliminate the cause
Dealing With Chronic Loss

- A given problem with 10 potential causes, 1 to 10
- Each time the problem occurs, the cause is different
- Measure focused only 1 specific cause, cannot control the problem
- Today problem is caused by 1, 2, 3
  2nd shift is caused by 7, 8 and 10

How do you deal with this type of problem?

Varying Combination of Losses

- Identify all factors that contribute to a loss
- Thoroughly investigate each factor
- Eliminate any malfunctions or sub-optimal conditions discovered in the process
Why Chronic Losses Persists:

- **Phenomena are insufficiently stratified and analyzed**
  - Defects and failures are not carefully observed and stratified
  - People do not notice the defect pattern (how), elements (where) periods (when)

- **Some factors related to phenomena are overlooked**
  - Potential causes are overlooked and uncontrolled
  - Uncontrolled factors can easily lead to Chronic Losses

- **Hidden abnormalities in individual factors are not addressed**
  - Failing to identify and respond to abnormal conditions
  - People are more alert to large problems since they appear more significant and the smaller the problem, the more likely they are to be ignored
  - Slight abnormalities include dirt, rust, vibration, looseness, slightly wear, dirty contact

Phenomenon - the physical event or precisely what happens to produce the defect in question. This is the abnormal event to be controlled.
Optimal Conditions:

- *A thorough elimination of slight abnormalities is a prerequisite for achieving zero defects and breakdowns*

OPTIMAL = Necessary + Desirable

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Necessary</th>
<th>Desirable</th>
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</thead>
<tbody>
<tr>
<td>Pulley arrangement accommodating all three belts</td>
<td>• At least one V-Belt must be installed for correct operation</td>
<td>• All 3 V-Belts should be installed for operation</td>
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<tr>
<td></td>
<td></td>
<td>• All 3 V-Belts should have equal tension</td>
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<tr>
<td></td>
<td></td>
<td>• The belts should be free of cracks &amp; grease</td>
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<tr>
<td></td>
<td></td>
<td>• Pulley should be free of abrasion</td>
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<tr>
<td></td>
<td></td>
<td>• The motor and speed reducer should be aligned properly at all times</td>
</tr>
<tr>
<td>Grease supply</td>
<td>• Grease must be supplied at specific locations</td>
<td>• Grease nipple should be kept clean</td>
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<tr>
<td></td>
<td></td>
<td>• Area around the grease fitting should be wiped clean after each application</td>
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<td></td>
<td></td>
<td>• The condition and volume level of used lubricant should be checked constantly</td>
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<tr>
<td></td>
<td></td>
<td>• Grease container should be kept clean</td>
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<tr>
<td></td>
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<td>• Used lubricant should be disposed of properly</td>
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<td></td>
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<td>• The number of days for the lubricant to reach the end of piping should be estimated</td>
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</table>
Optimal Conditions:
- Represents equipment operating at its highest level - reliable maintainable performing to the full extent of its design capabilities. It is the sum of 2 categories namely necessary and desirable.
- As good as new, it is what the equipment was designed and built.

Necessary Conditions:
- Minimum requirement to support equipment conditions.

Desirable Conditions:
- Desirable conditions are not essential for operation but they are needed to prevent breakdown and defects.