Continuous Improvement Toolkit

Mistake Proofing
Continuous Improvement Toolkit - www.citoolkit.com
- **Mistake Proofing**

- Consistently meeting expectations of the customer (internal or external) is an important characteristic of lean systems.

- One way to achieve this is by adhering to a practice called **quality at the source**.

- One way is using **mistake proofing** that aims to design fail-safe systems that attack and minimize errors as possible.

- It is a mechanism that helps an operator/user **avoid** mistakes.

- It is also a way to **detect** and correct an error where it occurs and avoid passing the error to the next worker/operation.
- Mistake Proofing

- Even the most conscientious person will make mistakes.
- **Mistake Proofing**

- A technique of changing the process/product to prevent mistakes from occurring (or detect them as soon as possible).
- This is a valuable tool during the control phase of the project.
- Used to remove the opportunity for an error before it happens.
- Used to keep the error from becoming a defect in the process/product.
- Improve the quality of products and services by having employees act as their own quality inspectors.
- **Mistake Proofing**

**When It Is Used?**

- When a process step has been identified where human error can cause mistakes or defects.
- When a minor error early in the process causes major problems later in the process.
- When the consequences of an error are expensive or dangerous.
- In a service process, where the customer or employee can make an error which affects the output.
- At a hand-off step in a process, when output or the customer is transferred to another worker.
- Mistake Proofing

Examples:
- A product that could be assembled in only one way.
- The **spell-check** feature on a word-processing program.
- The **engine control module** on vehicles to control top-end speed.
- The uses of different size **fuel pipes and nozzles** on vehicles in order to prevent the wrong fuel Bing used.
- **Color-coding of components** that otherwise look similar.
- When closing the file, the operating system may ask if you want to save your work first.
- Washing machines will not start if the door is opened.
- Irons and coffeepots that turn off automatically.
- Mistake Proofing

Common Mistake Proofing Devices:

- **Contact devices:** Guide pins, limit switches, stoppers & gates.
- **Non-contact devices:** Sensors, cameras, bar code readers, blinking lights and alarms.
- **Gauges and meters:** Thermometers, weighting scales.
- **Counters and timers:** Automatic counters, time switches.
- **Others:**
  - Critical condition indicators.
  - Lockouts.
  - Checklists and templates.
  - Color coding.
  - Computer controls.
- Mistake Proofing

- What machines or equipment you have at workplace that help operators to detect the occurrence of any abnormal condition?

- Consider Solutions Such As:
  - Shutdown the process.
  - Control the process to prevent a mistake from happening.
  - Provide a warning of a mistake before happening.
  - Provide a warning of a mistake after happening.
- Mistake Proofing

- Mistake Proofing is the use of an automatic device / method that:

<table>
<thead>
<tr>
<th>Makes it impossible for an error to occur (or reduce its risk)</th>
<th>Prevention / reducing</th>
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<tbody>
<tr>
<td>Alerts the operator when a mistake is about to be made</td>
<td>Detection</td>
</tr>
<tr>
<td>Makes the error immediately obvious once it has occurred</td>
<td>Detection</td>
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- Childproof cabs
- Computer alert
- Car speed alarm
Sources of Errors:

- Forgetfulness.
- Tiredness/ loss of concentration.
- Rushing/under pressure.
- Misunderstanding / misinterpretation.
- Lack of standards / procedures.
- Lack of training and experience.
- Lack of maintenance.
- Inadvertent errors.
- Willful errors (e.g. ignore warning light).
- Sabotage.
Mistake Proofing

Key Areas for Mistake Proofing:

- Process steps where human intervention is required.
- Points in processes where adjustments can be made.
- Decision points in the process.
- Repetitive tasks where physical manipulation of objects is required.
- Steps where errors are known to occur.
- Opportunities for predictable errors to occur.
- Mistake Proofing

Approach:

- Obtain or create a process map.
- Think of where and when human errors are likely to occur.
- For each potential error, work back to find its source.
- For each error, think of potential ways to make it impossible for the error to occur. Consider:
  - Eliminating the step that causes the error.
  - Replacing the step with an error-proof one.
  - Making the correct action far easier than the error.
- Otherwise, think of ways to detect the error and minimize its effects.
- Choose the best mistake-proofing method or device (per error).
- Test then Implement.
- **Mistake Proofing**

**Example:**

Sensors are placed on the floor between the shelves & will not allow the shelves to be closed when activated
- **Mistake Proofing**

**Further Information:**

- **Useful tools:**
  - Brainstorming to generate ideas.
  - FMEA to identify and prioritize potential errors.
  - Fishbone Diagram to find the source of the potential errors.

- Error Proofing solutions are particularly suited to repetitive manual tasks that rely on constant vigilance or adjustments.