



## **106 – Set up Reduction / Changeover Reduction (SMED)**

**Onsite – 3 Days, 8 Hours/day – Optimum class size, 6 - 9 students**

### **Training Description:**

This is training that dramatically reduces or eliminates changeover time. SMED is an acronym for “Single Minute Exchange of Dies” from the book, *The SMED System*, by Shigeo Shingo. The focus of the SMED technique is to reduce changeover time through the systematic elimination of the “internal” components of a changeover while streamlining the final changeover procedure. The four-step changeover improvement process helps companies design no/low-cost solutions for reducing changeover time. This in turn will help allow manufacturing to meet customer demands for high-quality, low-cost products, delivered quickly and without the expense of excess inventory.

### **Training Objective:**

Typical manufacturing plants take hours and even days, to make complete changeovers. A change over or setup change is the time from the last good part from one production run to the first good part from the next production run. That total time involved to perform the changeover is 100% non-value adding or waste. Reductions in the time spent in this activity drop directly to added capacity for increased sales of manufactured products and reduced waste or cost.

Most SMED “Kaizens” result in a 50 to 75% setup time reduction resulting from the initial activity.

### **Skill Attainment:**

The workshop will produce a set up team that is fully trained to repeat this activity on a continuing basis. In this hands-on workshop the team will:

- Participate in classroom training on the SMED technique
- Record and analyze the “as-is” setup utilizing video recordings
- Apply the SMED concepts to “externalize” much of the setup procedure
- Design and implement the new changeover procedure
- Design and have built any required hardware
- Document and perform the new procedure
- Video tape and document the new procedure
- Present to management

**These skills are transferable within the company, industry and are highly desirable by any manufacturer.**



Over the course of this three (8hrs per day) training employees will be participating in a train/do approach to Setup Reduction (SMED) using the following methodologies:

There are seven basic steps to reducing changeover using the SMED system:

1. OBSERVE the current methodology
2. Separate the INTERNAL and EXTERNAL activities. Internal activities are those that can only be performed when the process is stopped, while External activities can be done while the last batch is being produced, or once the next batch has started. For example, go and get the required tools for the job BEFORE the machine stops.
3. Convert (where possible) Internal activities into External ones (pre-heating of tools is a good example of this).
4. Streamline the remaining internal activities, by simplifying them. Focus on fixing observed that it's only the last turn of a bolt that tightens it - the rest is just movement.
5. Streamline the External activities, so that they are of a similar scale to the Internal ones.
6. Document the new procedure, and actions that are yet to be completed.
7. Do it all again: For each iteration of the above process, a 45% overall improvement in set-up times should be expected.

However, the power of SMED is that it has a lot of other effects which come from systematically looking at operations. Concepts covered in this class include:

- Stockless production which drives inventory turnover rates,
- Reduction in footprint of processes with reduced inventory freeing floor space
- Productivity increases or reduced production time
  - Increased machine work rates from reduced setup times even if number of changeovers increases
  - Elimination of setup errors and elimination of trial runs reduces defect rates
  - Improved quality from fully regulated operating conditions in advance
  - Increased safety from simpler setups
  - Simplified housekeeping from fewer tools and better organization
  - Lower expense of setups
  - Operator preferred since easier to achieve
  - Lower skill requirements since changes are now designed into the process rather than a matter of skilled judgment
- Elimination of unusable stock from model changeovers and demand estimate errors
- Goods are not lost through deterioration
- Ability to mix production gives flexibility and further inventory reductions as well as opening the door to revolutionized production methods (large orders ≠ large production lot sizes)
- New attitudes on controllability of work process amongst staff