

Changeover Tool

(COT-device)

JUSTIFICATION - Business Case



MID – Manufacturing Improvement Devices

(847) 800-2182

www.ooeincrease.com

Nov, 2010 (Ver.17)

Overview of manufacturing landscape

FACTS to be considered:

- To achieve World-class Overall Equipment Effectiveness (85% or higher), unnecessary “Stop & Go” line operation must be eliminated
- Machine adjustments to achieve peak efficiency is often perceived as “art” based on many years of operator’s experience. However, unnecessary machine tuning is always counterproductive and affects performance of entire line
- Many machines are modified or upgraded at some point without proper documentation. Inexperienced operators are unable to effectively resolve issues and create noticeably longer down-times compared with experienced operators
- In next few years big number of very skilled baby-boomers working on a factory floor will retire – tremendous knowledge and experience will go with them. It is anticipated that maintenance crisis is imminent and will be costly for US industry.
- Global economic trends and extremely competitive job market created new rules:
 - Loyalty of a company to an employee (or an employee to the company), has changed dramatically.
 - Job-security and perceived competitiveness could adversely affect experience sharing
 - Manufacturing management does not look favorably at old-fashion approach: “Learn from mistakes”

Why Changeovers are always challenging

Machine operator views & concerns:

- There are three key reasons why Changeovers are prone to mistakes:
 - **Multiple changeover locations** (typically 10-40 adjustment locations per machine)
 - **Multiple settings** at each location (machines today usually handle 2-15 different products)
 - **Working under pressure** to restore full line efficiency as fast as possible
- Waste elimination (Kaizen) training can not solve (or even rectify) situations with biggest financial impact:
 - Creation of scrap caused by machine tweaking (“Stop & Go” line operation during ramp-up period)
 - Manufacturing of the product of inferior quality during ramp-up period
- Classroom training of new operators how to effectively conduct Changeovers is definitively not as effective as “On the job training”
- Due to machine complexity learning curve of a new machine operator how to efficiently perform machine adjustments usually takes much longer than expected.
- Tight production schedules, volume of information to be memorized and cross-training often decrease expected value of traditional Changeover training.

Desired solution:

Device that will provide interactive step-by-step operator guidance

Not so obvious consequences of Changeovers

Traditionally, changeovers are viewed as a necessary evil . . .

- Lengthy changeovers result in **machine downtime**
- Idle equipment **reduces productivity** of valuable human resources
- Changeovers are complex and **require a high degree of skill and precision**
- Frequent adjustments **upset the delicate balance of machine settings**,
- Constant adjustments also increase the risk of **making out-of-spec products**
- **Scrap is generated** during the fine tuning phase of a changeover
- **Long lead times** reduce ability to service customers
- **Poor Forecast Accuracy**

Magnitude of Changeover Opportunity is **BIG** (in millions of \$/year – conservative estimate)

	Reduced Change-over time (\$MM)	Faster Ramp-up to full speed (\$MM)	Reduced Scrap (\$MM)	Reduced Training time (\$MM)	TOTAL savings (\$MM)
Major US Food Company	2	3	10	5	20

Future Changeovers must be:

- **Flawless** (done by any machine operator – even inexperienced)
- **Much shorter** (typically 1 min per adjustment at one location)
- **Much more predictable** (could be accurately scheduled)
- **No product variance** (any operator will implement same settings)
- **No tweaking** to reach optimal efficiency of a machine
- **No scrap** as a consequence of machine tweaking

Changeover opportunity is HUGE!

Bottom line:

- In today's demand-driven economy Companies can **save millions every year** by improving existing Changeover practices
- Manufacturers are increasingly looking at **automating Lean techniques** to capitalize on the opportunities that it presents
- Adopting “Changeover Tool” is an extremely cost-effective way to **deliver productivity improvements**