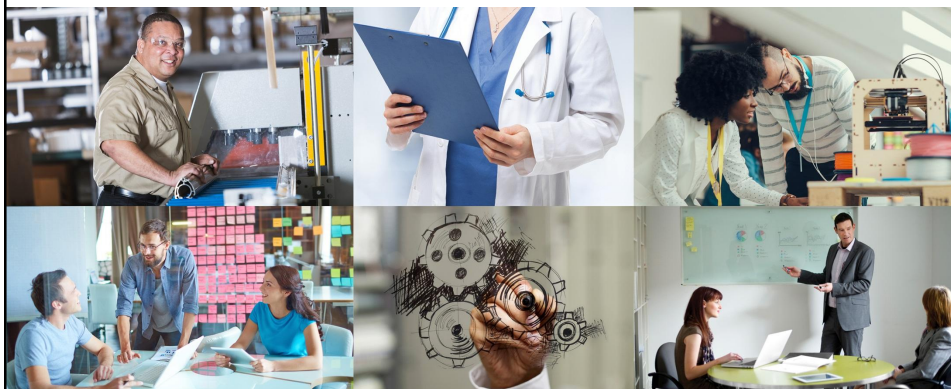


Eliminating Waste to Improve Productivity and Safety



*Ed Huey, IMEC Manufacturing Specialist
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Lean Safety

- Lean safety is a systematic approach to identifying and controlling the waste in processes/activities which could cause accidents or illnesses.
- Eight wastes are typically thought of in terms of production and quality processes. Relating safety to productivity is often a way to help gain buy-in from management for support and resources needed.

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Eight Waste Categories

- Overproduction
- Motion
- Transportation
- Waiting
- Underutilized employees
- Defects
- Non valued-added processing
- Excess inventory

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Overproduction

- Making more than is required by the next process
- Making earlier than is required by the next process
- Making faster than is required by the next process
- Causes of overproduction
 - *Just-in-case logic*
 - *Misuse of automation*
 - *Long process setup*
 - *Un-level scheduling*
 - *Unbalanced workload*
 - *Over engineered*
 - *Redundant inspections*

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How does this relate to safety?

Making more than is needed; clutter, takes up floor space, stress of making too much too fast. Employees are often seriously injured when there is pressure to hurry up and produce a part too fast, taking short cuts such as not using proper working surface guarding or personal protective equipment.

Covid? Might start purchasing more or making more due to possible supply chain disruptions.

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Waiting

- Idle time created when waiting for...?
- Causes of waiting waste
 - *Unbalanced workload*
 - *Unplanned maintenance*
 - *Long process setup times*
 - *Misuses of automation*
 - *Upstream quality problems*
 - *Unlevel scheduling*

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How does this relate to safety?

Makes people uncomfortable and they will act and do, even if uncertain on the proper procedure

Covid: Waiting at a time clock, microwave, copy machine, etc

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Transportation

- Transporting parts and materials around the plant
- Causes of transportation waste
 - *Poor plant layout*
 - *Poor understanding of the process flow for production*
 - *Large batch sizes, long lead times, and large storage areas*

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How does this relate to safety?

Moving product around, crushed by and caught in hazards increase when there is more movement, there are more hazards

Covid: Could this be increasing do to increase spacing?

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Non-Value-Added Processes

- Effort that adds no value to the product or service from the customers' viewpoint
- Causes of processing waste
 - *Just-in-case logic*
 - *True customer requirements not clearly defined*
 - *Over-processing to accommodate downtime*
 - *Lack of communication*
 - *Redundant approvals*
 - *Extra copies/excessive information*

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How does this relate to safety?

A manufacturer bought a new metal folding machine. This caused that area to have produced three months inventory in advance. What happens to metal after three months? The cabinets were rusting, forcing the company to add another step of rust removal, which creates a new hazard to the employee in using hazardous chemicals.

Covid: Sanitation processes (NVA but necessary)

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Excess Inventory

- Any supply in excess of a one-piece flow through your manufacturing process
- Causes of excess inventory
 - *Need for buffer against inefficiencies and unexpected problems*
 - *Product complexity*
 - *Unleveled scheduling*
 - *Poor market forecast*
 - *Unbalanced workload*
 - *Misunderstood communications*
 - *Reward system*
 - *Unreliable shipments by suppliers*

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How does this relate to safety?

Sits on the floor, trip and fall hazards and requires more material handling

Covid? Byproduct of over production or over purchasing just incase supply chain disruptions.

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Defects

- Inspection and repair of material in inventory
- Causes of defects
 - *Weak process control*
 - *Poor quality*
 - *Unbalanced inventory level*
 - *Deficient planned maintenance*
 - *Inadequate education/training/work instructions*
 - *Product design*
 - *Customer needs not understood*

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How does this relate to safety?

Caused by a failure in the process, causes rework or need to clear scrap out of the area or machine, putting employee in harms way

Covid. People who miss work. Good cross training?

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Excess Motion

- Any movement of people or machines that does not add value to the product or service
- Causes of motion waste
 - *Poor people/machine effectiveness*
 - *Inconsistent work methods*
 - *Unfavorable facility or cell layout*
 - *Poor workplace organization and housekeeping*
 - *Extra “busy” movements while waiting*

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How does this relate to safety?

Reaching, grabbing, poor ergonomic practices such as improper workstation design

Covid, maybe increasing due to spacing

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Underutilized People

- The waste of not using people's mental, creative, and physical abilities
- Causes of people waste
 - *Old guard thinking, politics, the business culture*
 - *Poor hiring practices*
 - *Low or no investment in training*
 - *Low pay, high turnover strategy*

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How does this relate to safety?

Tend to do what they shouldn't, not their nature to be idol. There is also a risk of complacency when tasks become monotonous

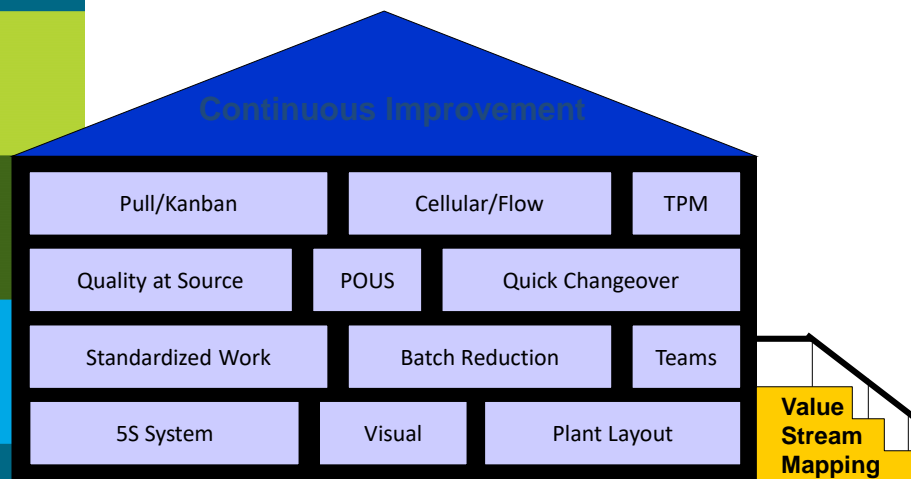
Covid? Cross training

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Lean Building Blocks



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Formalizing Housekeeping Procedures

- To help formalize a company's sanitation and housekeeping techniques and hazard prevention program, a concept called 5S +1 may be utilized

5S + 1

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How does this relate to safety?

A safe, clean, organized workplace where there is a specific location for everything that is required, and eliminates anything that is not required for an area

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5S+1 for Sanitation and Housekeeping

- Sort
- Set in order
- Shine
- Standardize
- Sustain
- Safety

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5S+1 Steps

- **Sort** = Eliminate all unneeded items in an area
- **Set in Order** = Identify where the remaining items should be located and determine limits
- **Shine** = Clean and inspect everything

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Before Sort



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Red tag area



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Set in order



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5S+1 Benefits

- Up to 50 percent reduction in incidents
- Many 5S programs use safety as one of the S components
- An organization's concern for safety can be a significant contributor to morale and pride

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5S+1 Steps—continued

- **Standardize** = Establish rules for maintaining and controlling the first three components
- **Sustain** = Utilize the 5S standards routinely
- **Safety** = Build safety into the process

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Visual Standards



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Standards for sanitation

Frequency of Contact	Surface Type	Cleaning Frequency
HIGH	Doorknobs to restrooms, entrances, breakrooms	Every 2 hours
HIGH	All restroom fixtures and stalls	Every 2 hours
HIGH	Water fountain handles	Every 2 hours
HIGH	Shared computer workstations	Every 2 hours
MEDIUM	Tables, appliances, cabinets in breakroom	After each break
MEDIUM	Forklifts, pallet jacks	Every 4 hours
MEDIUM	Hand tools	After each use
LOW	Doorknobs to individual offices	Daily
LOW	Individual computers, phones, keyboards, cell phones	Daily



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5S+1 Benefits—continued

- Raises the levels of employee participation and awareness
- Results in safer working conditions
- Reduces lost time accident rates
- Reduces costs of accidents (direct and indirect)



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Lean and Safety


- Company attempts to improve productivity and quality without a strong emphasis on safety typically result in higher incident and worker compensation rates.
- National studies show a strong correlation between high incident rates and lean implementations where strong safety programs are not present.

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Lean and Safety

- Productivity improvements can often drive to unsafe work practices.
- People facilitating the productivity improvements need to understand the safety concepts related to the process.
- People facilitating the productive improvements need to ensure that the required safety concepts be built into the process.

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**ORGANIZE TO IMPROVE:
Workplace Organization for
Manufacturing Virtual 2-Part Training**

- February 2 & 9 | 1pm-3pm
- Virtual Training
- Teach your team to apply the 5S Workplace Organization system of sort, set in order, shine, standardize and sustain.
- \$350/company for up to 3 people
- www.IMEC.org/Events to register



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Date	Session
Jan 21	FILL THE GAP: Solving the Welder Shortage with Robotic Technology Webinar
Jan 26	DRIVE BIG CHANGE: Manufacturing E-Commerce Success Webinar
Jan 28	IMPROVE YOUR CULTURE: Diversity & Inclusion in Workplace Policies Webinar
Feb 2, 9	ORGANIZE TO IMPROVE: Workplace Organization for Manufacturing Virtual 2-Part Training
Feb 3, 17	BOOST SALES SKILLS: Building Virtual Relationships Training Series for IL Manufacturers (Sessions 2 and 3)

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Date	Session
Feb 4	EQUIP YOUR TEAMS: How a Training Matrix Can Identify and Address Skill Gaps
Feb 9, 12, 16, 19, & 23	SPARK NEW GROWTH: eCommerce Strategy for Manufacturers 5-Part Series <ul style="list-style-type: none"> • Develop a Scalable Marketing System That Connects with Your Ideal eCommerce Customer • Inbound Marketing for Manufacturers: A Modern Approach to Lead Generation and eCommerce Sales • 7 Things Manufacturers Should Do to Automate Marketing, Get More eCommerce Sales and Boost SEO • Manufacturers Going Global with eCommerce • Monitoring & Measuring eCommerce Success for Manufacturers
Feb 9	Robotic End of Arm Tooling and Grippers Webinar
Feb 11	KEEP IT LEGAL: Need-to-Know COVID-19 Employment Issues for the New Year Webinar
Feb 18	EXPAND YOUR NETWORK: Capture the Exciting Opportunities Waiting on LinkedIn
Feb 24	<i>SAVE THE DATE!</i> PROTECT YOUR TEAM: Post-COVID Safety Workshop

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Date	Session
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