

Pollution Prevention Basics

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Pollution Prevention

Means...

Preventing or reducing waste
Reducing (toxic) materials used

Waste Management “Ladder”



- Pollution prevention
 - Use less
 - Waste less
- Reuse/recycle
- Treat
- Dispose

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Use Less



- Raw materials
- Hazardous materials
- Water, energy

Use Less

- Product design
- Process design
- Control material use
- Less toxic alternatives

Use Less

- **Product design**
- Process design
- Control material use
- Less toxic alternatives

Use Less

Product design

- Less packaging
- No painting needed
- Last longer



Use Less

- Product design
- **Process design**
- Control material use
- Less toxic alternatives

Use Less

Process design

- **Powder coatings** eliminate emissions, use less material
- **Abrasive cleaning** without chemicals
- **Bake ovens** clean with heat



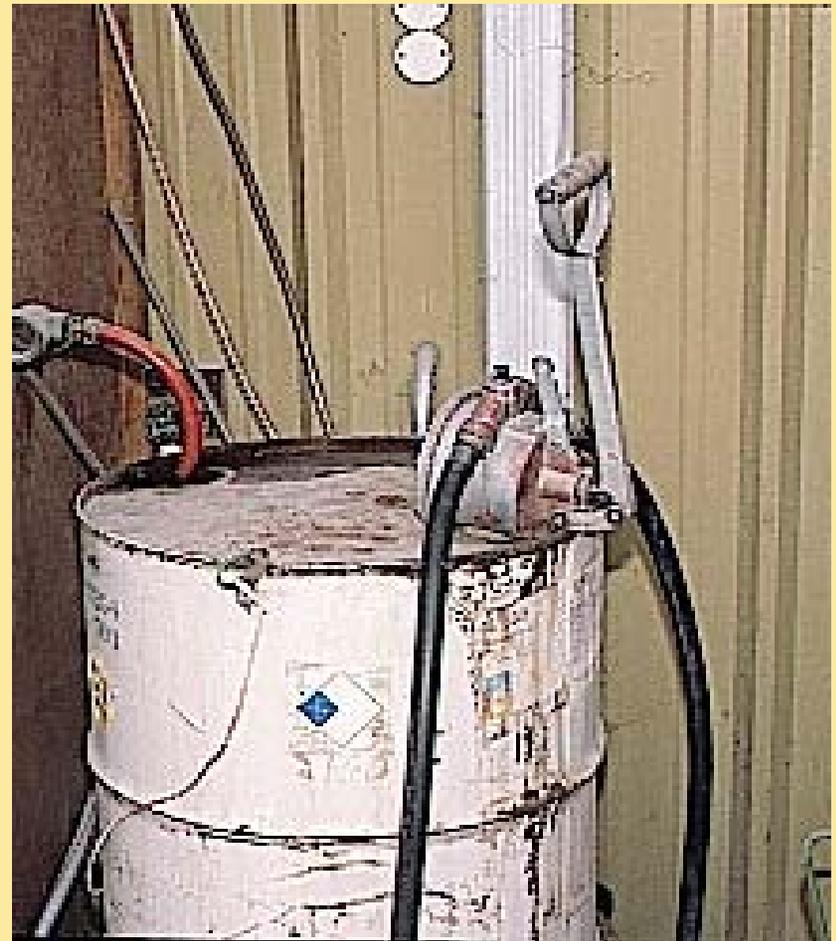
Use Less

- Product design
- Process design
- Control material use
- Less toxic alternatives

Use Less

Control material use

- Dispense less
- Establish material use standards



Use Less

- Product design
- Process design
- Control material use
- Less toxic material

Use Less

Less toxic material

- Clean with water instead of solvent
- Water-based paints
- Less toxic textile dyes



Waste Management “Ladder”



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- Treat
- Dispose

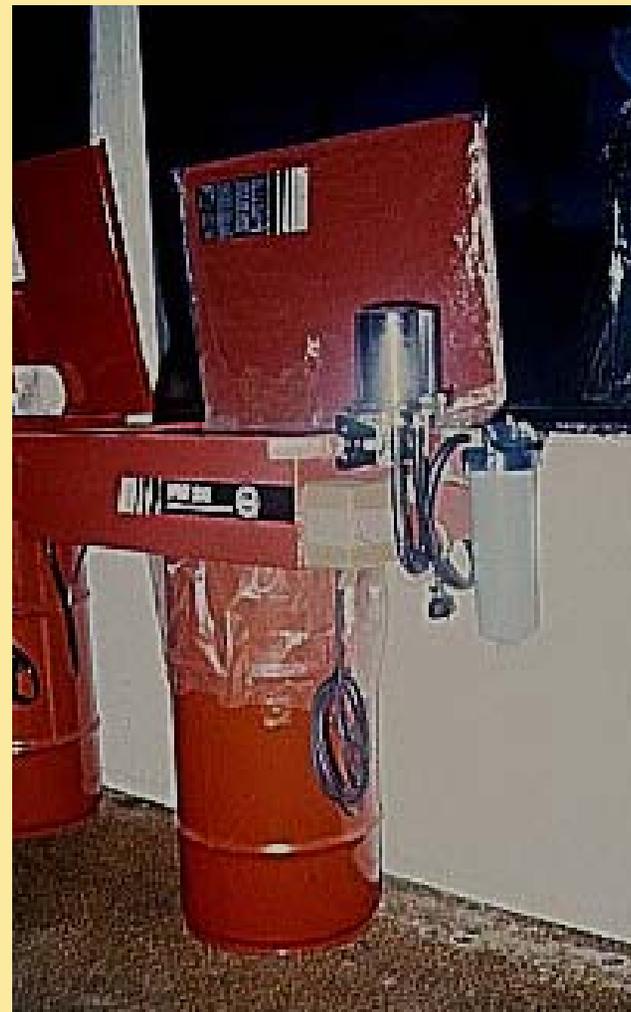
Waste Less

- Stop leaks
- Reduce paint overspray
- Buy in bulk containers



Waste Less

- Extend life of working fluids
 - Maintain solutions
 - Reduce drag-out & evaporation



Waste Management “Ladder”



- Pollution prevention
 - Use less
 - Waste less
- **Reuse/recycle**
- Treat
- Dispose

Reuse/Recycle



- On-site vs off-site
- Direct reuse vs reclamation



Waste Management “Ladder”



- Pollution prevention
 - Use less
 - Waste less
- Reuse/recycle
- **Treat**
- Dispose

Treat the Waste

- Reduce hazard
 - precipitate metals
 - carbon filter organic contaminants
- Reduce volume
 - evaporation
 - filter press

Waste Management “Ladder”



- Pollution prevention
 - Use less
 - Waste less
- Reuse/recycle
- Treat
- **Dispose**

Disposal



Move Up The Ladder



- Select options as high on the ladder as you can.
- Example: solvent cleaning
 - Reclaim hazardous solvent through distillation
 - Change to water-based or abrasive cleaning

Move Up The Ladder



- Example: office paper

Send to a recycler

Better yet, print both sides of paper

Better yet, don't print

Pollution Prevention

- Moves “beyond compliance”
- Yields benefits beyond compliance

Benefits

- Save \$
- Reduce liability
- Improve market share and competitiveness
- Improve safety and working conditions
- Reduce regulatory “exposure”
- Improve public image



Will It Save Money?

- Know the current costs
- Estimate future costs and savings of a P2 project
- Don't overlook "hidden" costs



Amoco, Yorktown

- Refinery estimated its environmental costs to be 3 or 4 % of operating costs
- Actual costs were 22%
- Environmental costs often hidden in “overhead”



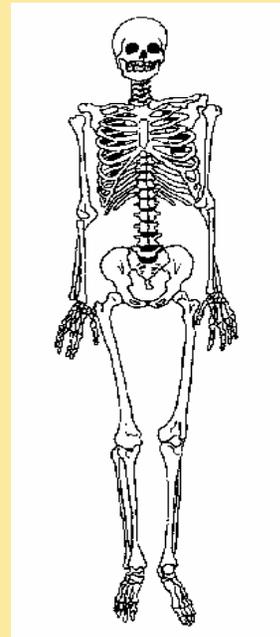
Helpful Resources

Financial Analysis

- “Cost Analysis For Pollution Prevention” (WDOE)
- P2 Finance – free download from <http://www.tellus.org/general/software.html>

P2 Promotes “Lean”

- “Lean Manufacturing” reduces activities that **don’t add value** to the product or service being marketed.



Potential Results From“Lean”

- 90% reduction of production times
- 50% increase in productivity
- 80% quality improvement
- 75% improvement in space utilization
- 85% reduction of "work in progress" (stuff waiting to be finished)

Lean Success Stories

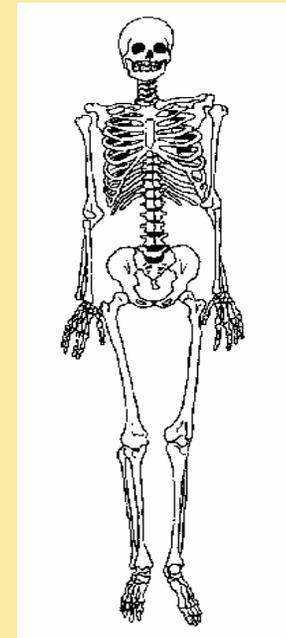
- G. Loomis fishing rods, Woodland
- Precision Aerospace, Sumner

Lean Manufacturing

- Business is very interested in Lean Mfg.
- MRW staff can use Lean Mfg. concepts to promote pollution prevention

P2 Promotes “Lean”

- Managing waste or cleaning up contamination do not add value to a product. P2 can reduce this.

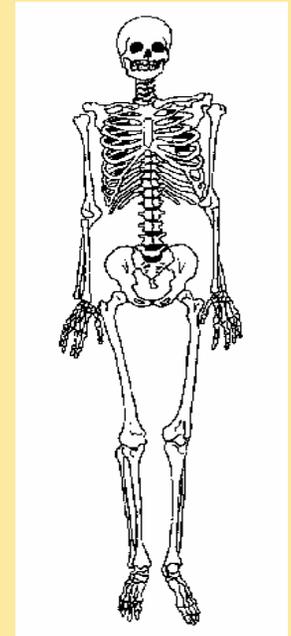


P2 Promotes “Lean”

Using hazardous raw materials entails extra non-value added activity

- Protective equipment
- Hazard training
- More record-keeping and reporting
- More regulatory requirements
- Engineering controls

Non-hazardous material is “leaner”



Why Businesses Listen To “Lean”

- The “E” word (environment = external)
- Lean addresses production (= core business objective)

Why Businesses Listen To “Lean”

Business is looking for benefits beyond environmental cost savings:

- 90% reduction of production times
- 50% increase in productivity
- 80% quality improvement
- 75% improvement in space utilization
- 85% reduction of "work in progress" (stuff waiting to be finished)

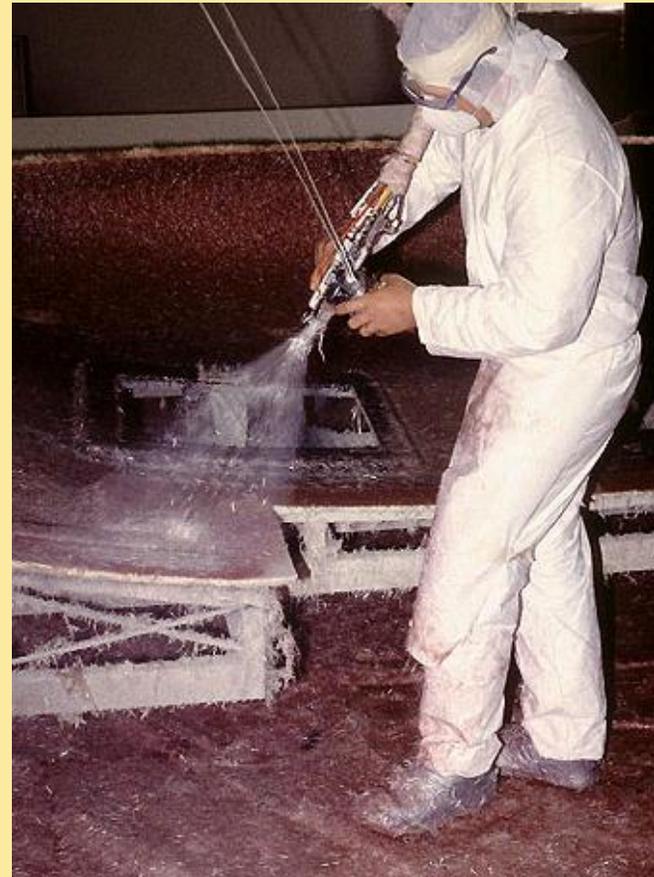
Lean Examples of P2

- Spray gun washer reduces non-value activity, set-up time, solvent waste



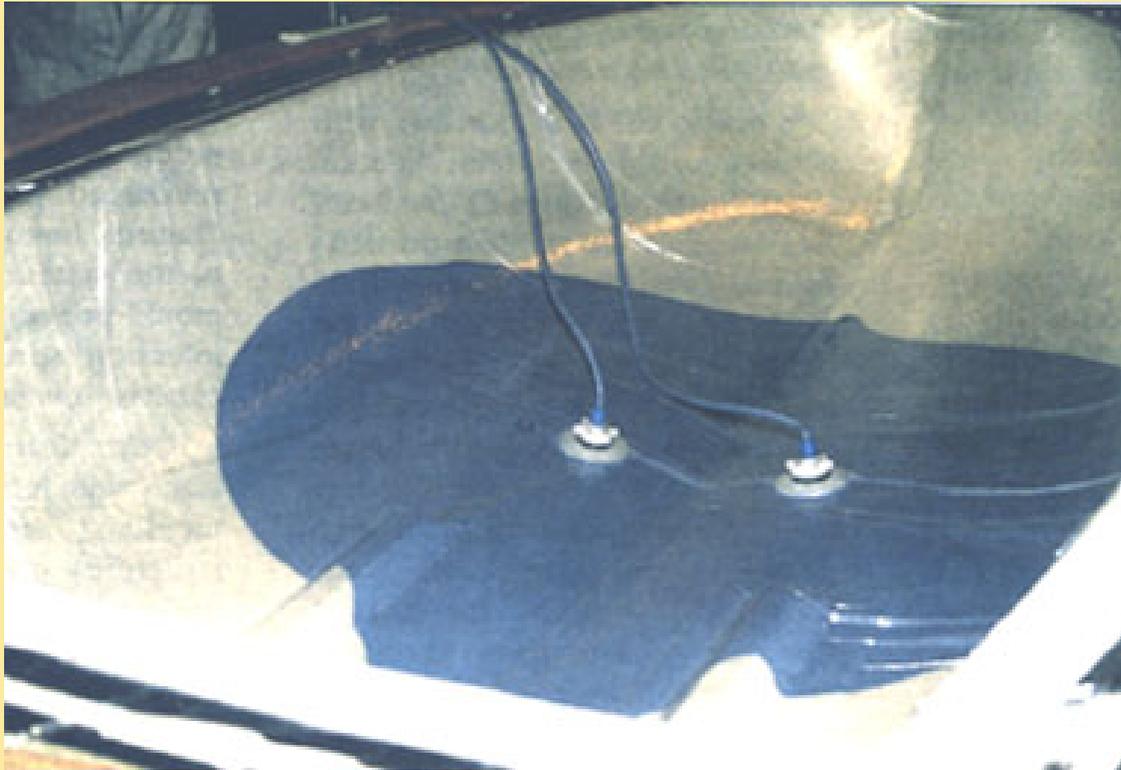
Lean Examples of P2

- Fiberglass shop: closed molding reduces labor, waste, emissions



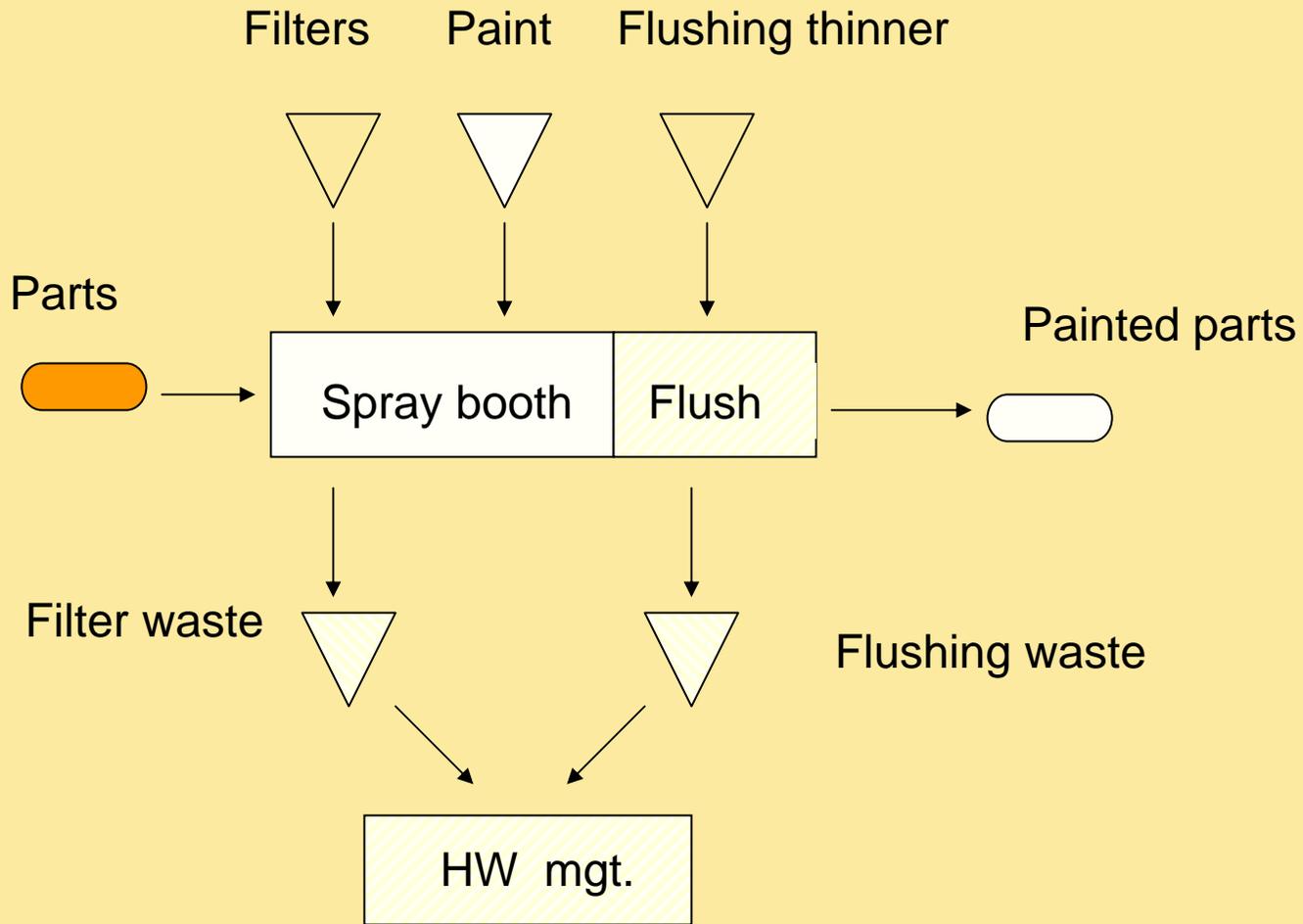
Lean Examples of P2

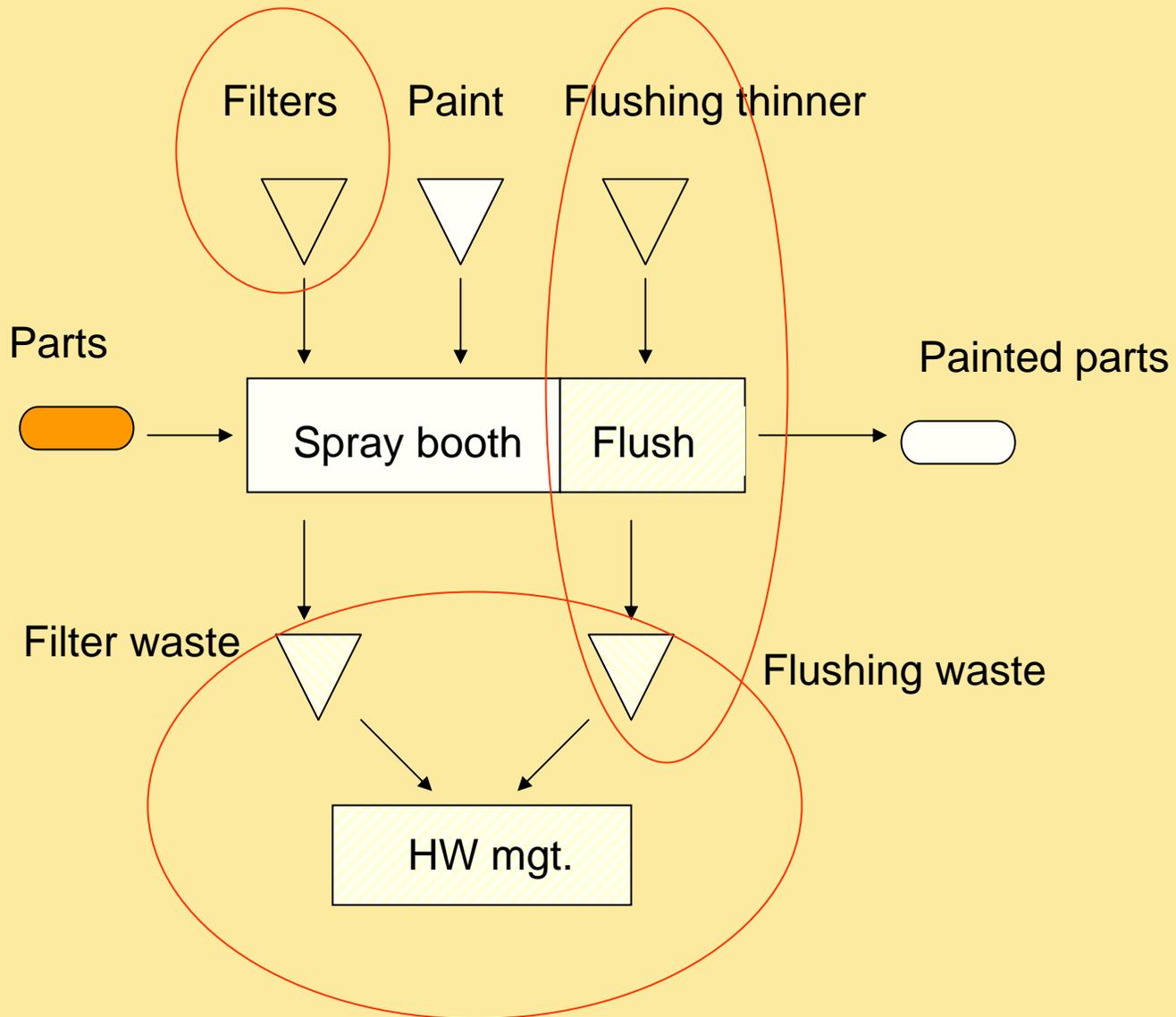
- Fiberglass shop: closed molding reduces labor, waste, emissions



Technical Assistance Exercise

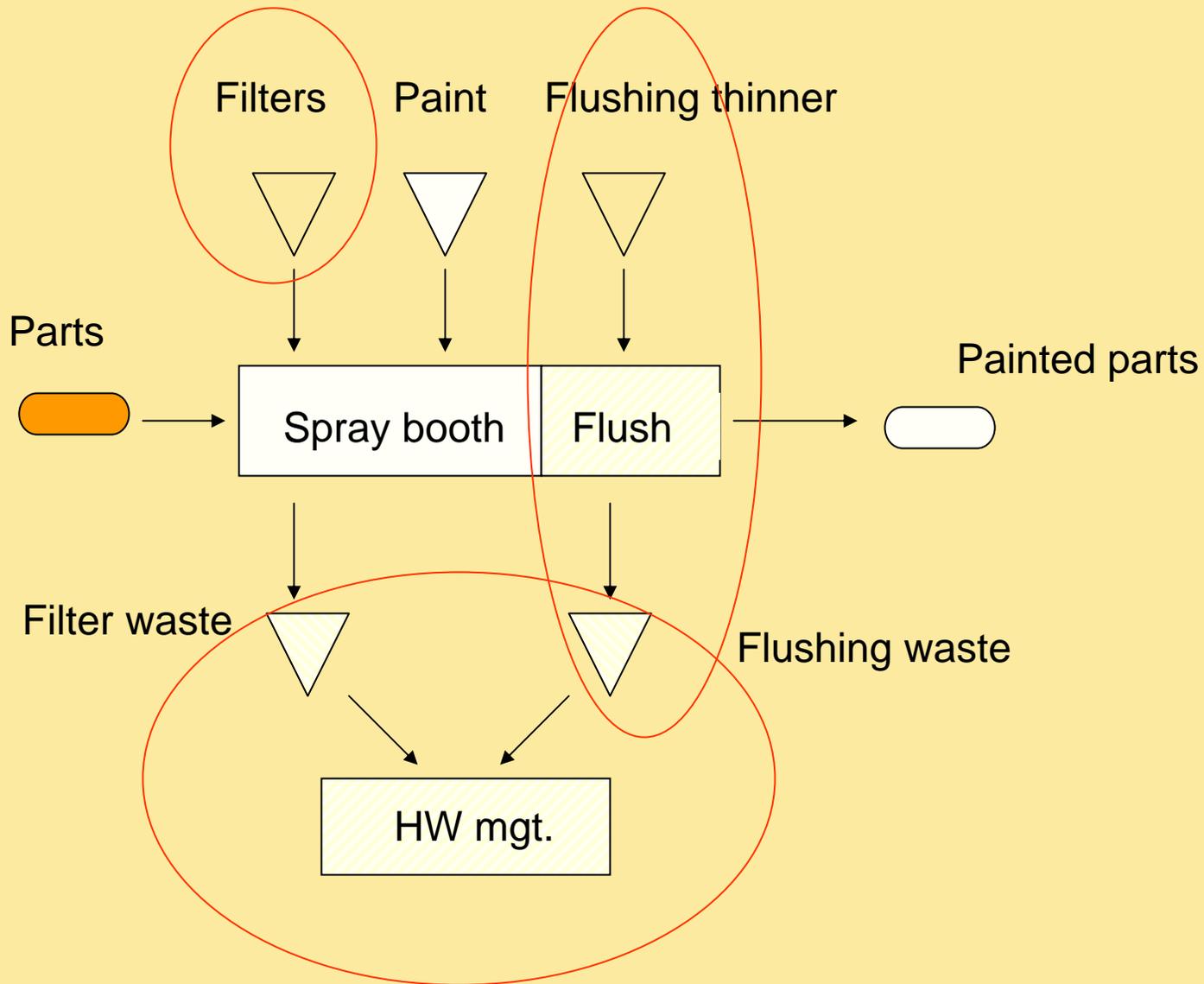
- Paint booth operation
- Value added: put paint onto parts
- Point out what is not Lean (wasted material or activity)





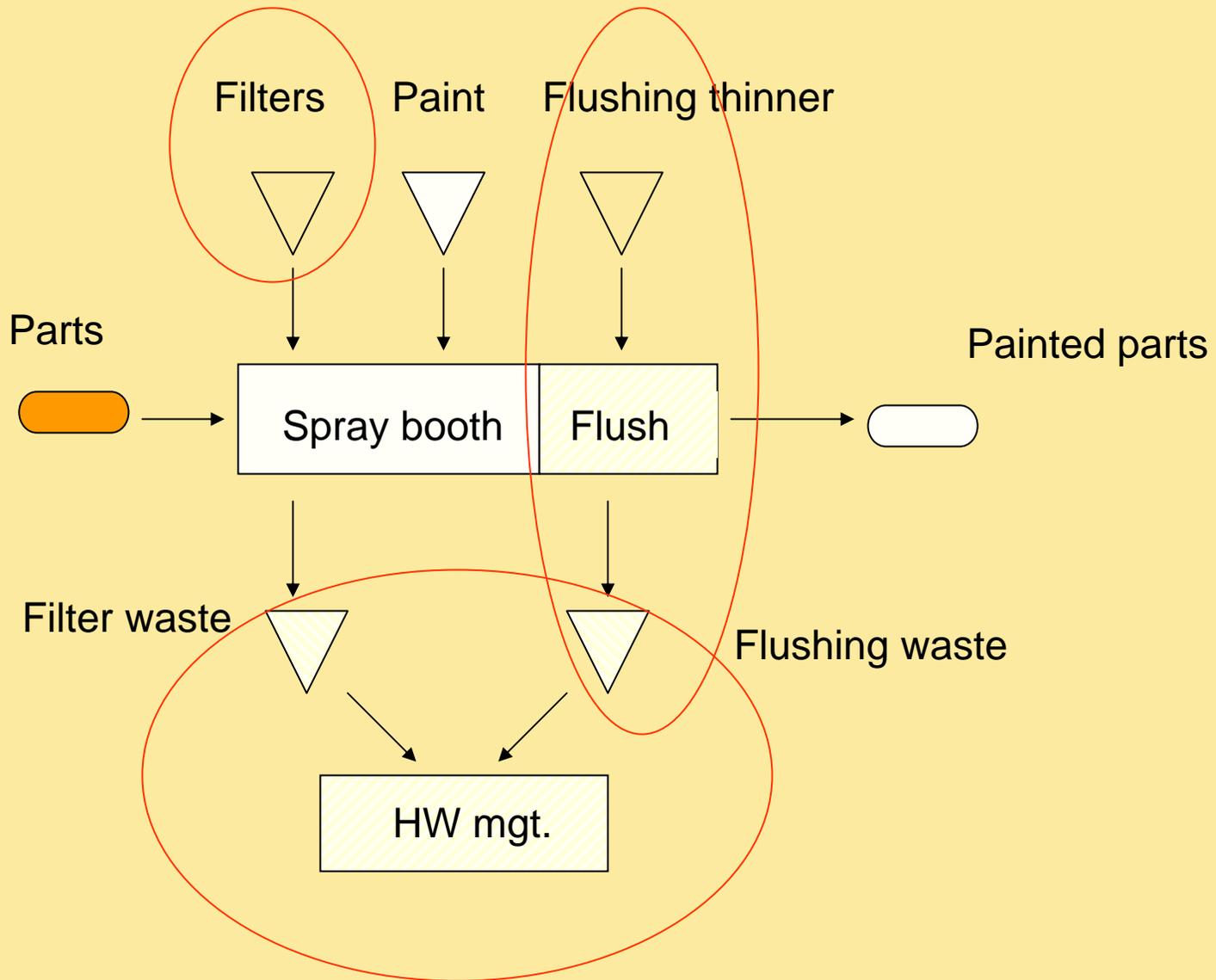
TA Exercise

- How could P2 would reduce these non-value added activities?
 - Filter waste
 - Flushing waste



TA Exercise

- How could P2 would reduce these non-value added activities?
- Filter waste:
 - Paint that does not cause filters to be hazardous
 - Reduce paint overspray that clogs filters



TA Exercise

- How could P2 would reduce flushing waste?
 - Reduce need to flush (dedicated equipment, batch scheduling)
 - Reuse flushing solvent
 - Install a gun washer
 - Blow air back through system from spray gun

Helpful Resources

Pollution Prevention Ideas

- Employees
- Trade journals and conferences
- Suppliers
- State and local P2 specialists
- Websites



Helpful Resources

Pollution Prevention Websites

WDOE

<http://www.ecy.wa.gov/programs/hwtr/reducewaste.html>

ODEQ

<http://www.deq.state.or.us/programs/p2/p2.htm>

PPRC <http://www.pprc.org>

P2Pays <http://wrrc.p2pays.org/default.htm>

Envirosense <http://es.epa.gov>



WDOE Website: Sector P2

Aerospace/Aircraft

Paint Manufacturing

Federal/Military Facilities

Boats, Ships & Marinas

Chemical Blenders

Inorganic Chemical Mfg

Fiber-Reinforced Plastics

Wood Preserving

Schools

Painting & Coatings

Electroplating

Automotive

Photoprocessing

Stormwater

Dry Cleaners

Printing

Metal Fabrication

Votech

Electronics