Expanding Business Value Through Pollution Prevention & Sustainable Practices

Lean Manufacturing & Pollution Prevention

Presented by
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New Hampshire Pollution Prevention Program

Lean Manufacturing & Pollution Prevention

EPA “Lean & Environment” Project

- Create Pollution Prevention Program and Manufacturing Extension Partnership teams in Massachusetts, Maine and New Hampshire.
- Conduct combined Lean & P2 Assessments in two facilities in each state
New Hampshire project objectives:

- Determine if it’s possible and practical to integrate Lean Manufacturing and P2 methodologies.
- Develop a working relationship between two mutually-unfamiliar programs (NH Pollution Prevention Program & NH Manufacturing Extension Partnership).

How did Lean Manufacturing start?

From B-24’s…

…to Corollas
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How did Pollution Prevention start?

From disaster...

...to sustainability

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Two very different systems...
Developed by two very different entities...
Under very different circumstances...
For very different reasons.

Is it any wonder the two never mingled?
### Lean Manufacturing & Pollution Prevention

Integrating Lean Mfg. and P2 methods – differences:

<table>
<thead>
<tr>
<th>MEP (Lean Programs)</th>
<th>NHPPP (P2 Programs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paid consultants</td>
<td>Free Services</td>
</tr>
<tr>
<td>Private business program</td>
<td>“State” program</td>
</tr>
<tr>
<td>Subcontracted specialists</td>
<td>1 to 2 day process</td>
</tr>
<tr>
<td>3 to 5 day process</td>
<td>Services generally</td>
</tr>
<tr>
<td>Strategies implemented &amp; measured</td>
<td>end with report</td>
</tr>
</tbody>
</table>

### Lean Manufacturing & Pollution Prevention

Integrating Lean Mfg. and P2 methods – differences:

**Traditional Lean variables** ≠ **Traditional P2 variables**

- Cycle Time
- Distances
- Lead Time
- Changeover
- Takt Time

- Hazardous matls.
- Equipment losses
- Operating flaws
- Spills, Leaks
- Hazardous Wastes
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Lean Manufacturing is activities or strategies that:

- Eliminate or reduce the expenditure of resources for anything other than what is of value to the customer
- Make better use of production time, raw materials or energy
- (Thereby reducing waste)

Pollution Prevention is activities or strategies that:

- Eliminate or reduce the volume or toxicity of wastes
- Conserve water or energy
- Reuse materials & wastes
- (Thereby increasing efficiency)

Integrating Lean Mfg. and P2 methods – overlap:

- Lean Mfg. now looks at all inputs including energy, water and hazardous & non-hazardous raw materials.
- Pollution Prevention now looks at “non hazardous” raw materials such as energy and water.
- Both programs look at inefficient practices and equipment that create waste.
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Integrating Lean Mfg. and P2 methods – similarities:

<table>
<thead>
<tr>
<th>Lean</th>
<th>P2</th>
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<tbody>
<tr>
<td>Value Stream Mapping</td>
<td>Process Flow Diagramming</td>
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<tr>
<td>Kaizen Event</td>
<td>Brain Storming</td>
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Lean Current State Mapping

[Image of Lean Current State Mapping]
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Lean Value Stream Map (partial)

Value Stream Map detail
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The New Hampshire experience:

- CIL, Inc. – What is Lean? Who are the players?
- BAE Systems – Can we work together?
- High Liner Foods – Where does P2 fit in?
- Hendrix Wire – It all comes together.

Lessons Learned:

- Lean and P2 methods are compatible.
- Building a relationship is crucial.
- Lean and P2 usually develop the same strategies.
- Unexpected environmental costs could have been incurred without environmental expertise.
- Each can serve as a resource to the other.
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The New Hampshire experience:

Next Steps:

- More combined assessments?
- Mutual program promotion
- Other combined activities

The project was a success in that the objectives were achieved.

Each program developed an understanding and respect for each other.

NHPPP and NH MEP aren’t getting married, maybe just dating, occasionally.
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Questions?

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