Air Permit Backlog Kaizen
Kickoff & Lean Overview
<table>
<thead>
<tr>
<th>DEQ Participants</th>
<th>Role/area of knowledge</th>
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<tbody>
<tr>
<td>Ali Mirzakhalili</td>
<td>Air Division Administrator</td>
</tr>
<tr>
<td>Jaclyn Palermo</td>
<td>HQ Air Operations Manager, lead manager for lean process improvement</td>
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<tr>
<td>Claudia Davis</td>
<td>Western Region permitting manager - Salem</td>
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<tr>
<td>Mark Bailey</td>
<td>Eastern Region permitting manager - Bend</td>
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<tr>
<td>Matt Hoffman</td>
<td>Northwest Region permitting manager - Portland</td>
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<tr>
<td>Michael Orman</td>
<td>HQ Air Planning manager (was Northwest Region permitting manager)</td>
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<tr>
<td>Nancy Swofford</td>
<td>Permit coordinator – Eastern Region</td>
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<tr>
<td>Karen White Fallon</td>
<td>Permit writer – Western Region. Primarily Title V, some ACDP</td>
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<tr>
<td>Walt West</td>
<td>Permit writer – Eastern Region. Title V and ACDP</td>
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<tr>
<td>David Gravier</td>
<td>Permit writer – Northwest Region. Title V and ACDP</td>
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<tr>
<td>Patty Jacobs</td>
<td>Permit writer – Northwest Region. Primarily Title V and some ACDP</td>
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<tr>
<td>Paul DeVito</td>
<td>Permit writer – Eastern Region. Primarily ACDP</td>
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<tr>
<td>Dan Defehr</td>
<td>Permit writer – Northwest Region. Primarily ACDP, web improvement team</td>
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<tr>
<td>Tim Wollerman</td>
<td>Air Communications Specialist – public meeting process improvement team, web improvement team</td>
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<tr>
<td>Jill Inahara</td>
<td>HQ lead permit engineer (attending one day)</td>
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<tr>
<td>Angela Parker</td>
<td>Potential project manager for improvements (attending report outs)</td>
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<tr>
<td>Sue Langston</td>
<td>Project manager for air audit response</td>
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<tr>
<td>Marcy McKey, Kelly Kita</td>
<td>Pivotal Resources consultants who will facilitate Kaizen</td>
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<tr>
<td>Lauri Aunan</td>
<td>Implementation Administrator (attending report outs)</td>
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<tr>
<td>Nina DeConcini</td>
<td>Northwest Region Administrator (attending report outs)</td>
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<tr>
<td>Linda Hayes Gorman</td>
<td>Eastern Region Administrator (attending report outs)</td>
</tr>
<tr>
<td>Keith Andersen</td>
<td>Western Region Administrator (attending report outs)</td>
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Kick-Off Message

- Problem Statement
- Objectives
- Benefits
- Expectations
### IN SCOPE

- Technology that DEQ has available
- Authorities DEQ already has
- Proposing minor rule changes (*Note: Any proposed rule changes will be put in the parking lot, and evaluated for feasibility post-kaizen*)
- Renewed permits only, modified permits if modifications are included in renewals
- ACDP and Title V permit application intake and processing - Application submission and intake
- ACDP and Title V Permitting: permit writing and issuance - Public comment process
- Title V permit: establishing emissions basis in TRAACS (air permit tracking database) using workbooks
- ACDP and Title V invoice deadline process
- Touch points with Cleaner Air Oregon (air toxics) program – places CAO might impact Title V and ACDP and vice versa
- Knowledge transfer from permit writers and facility environmental managers when turnover occurs (succession planning)
- Identifying information that can help inform EDMS (new information technology system)

### OUT OF SCOPE

- Technology that DEQ would need to purchase
- Changes to Oregon Statutes or DEQ authority
- Major rule changes
- New or Modified permit process
- Additional resources or personnel
- ACDP and Title V Permitting: Source reporting intake and processing
- ACDP and Title V Permitting: Invoicing
- Submission of emission data to EPA
- Intake and processing of complaints
- Compliance and enforcement
- Enforcement reporting to EPA
- Performance Partnership Agreement development
- Pre-application AQ modeling for source with significant emission rates
- New source review
- Detailed Cleaner Air Oregon implementation process
Day 1
- Sponsor Kickoff
- Problem Statement & Objectives
- High Level Process Overview & Voice of the Customer
- Review and Confirm Detailed Current State Map
- Value Adding Analysis

Day 2
- Lean Analysis Tools: 8 Wastes, Root Cause Analysis/5 Whys
- Prioritize Areas for Improvement
- Lean Process Principles and Design Tools
- Break-Outs: Create Mini Charters for Priority Areas and Brainstorm Solutions
- Solutions Priority Matrix
- Sponsor Update

Day 3
- Break-Outs: Design Future State Lean Process Solutions
- Change Management Assessment & Planning
- Implementation Planning Preparation
- Sponsor Update

Day 4
- Implementation Planning Round 1: Before/After Comparison, Project Plan, Measurements, Communications
- Implementation Planning Round 2 (if needed)
- Compare & Contrast to ACDP
- Wrap Up and Action Planning
- Sponsor Update
Lean Overview -- Agenda

- Background
  - What is Kaizen
  - Objectives
  - History of Lean
  - Lean Thinking
  - Premise of Lean

- Lean Fundamentals
  - Value
  - Waste
  - Flow
  - Takt Time
  - Pull
  - Management System

- Lean Tools
  - Process Maps
  - Measurements
  - Cause & Effect
  - The 5 Whys
  - Priority Matrix
  - Scope
  - Visual Management
Welcome to Lean Process Improvement

Objectives and Benefits

- Obtain an introduction to Lean process improvement principles.
- Practice and apply Lean principles and tools in a Kaizen event.
- Begin to integrate “Lean thinking” into your daily work.
1902: Sakichi Toyoda invented an automated loom that stopped any time a thread broke.

1927: Kiichiro Toyoda expanded the family loom business into auto manufacturing and founded the company that would become Toyota Motor Corporation.

1908: Henry Ford developed the assembly line technique of mass production.

What is Lean?

“A manufacturing philosophy that shortens the time between the customer order and the shipment by eliminating waste.”

- John Shook American manager with the Toyota Supplier Support Center in Lexington, KY, assisting North American companies to implement the Toyota Production System.
Lean Six Sigma – Focus on the Process

**The Premise of Lean**

- Identify & eliminate wasteful activities; streamline flow and value

**The Premise of Six Sigma**

- Identify & eliminate variation and defects. Identify and control the root causes.

Usually, *both* will be relevant, but a particular project may be more focused on one goal or the other.
**Value** – An activity that the customer is willing to pay for

**Waste** – An excessive or unwanted step, resource, or activity in your process

**Flow** – Align capacity with demand so that the product/service flows at the right speed

**Takt Time** – The rate at which a customer demands or “pulls” a product or service i.e. the heartbeat of your organization

**Pull** – Processes where the actual customer order triggers production as opposed to the producer “pushing” to the customer. Reduces waiting, inventory and over production.

**Management System** – Systematized management of processes to deliver optimal customer value, and drive intolerance of waste.
**Value** – An activity that the customer is willing to pay for.

- **Value-Added (VA):** work that occurs in the process that is perceived to add value to the customer

- **Non-Value Added (NVA):** a step that does not directly contribute to value i.e. waste

- **Non-Value Added Essential/Enabling:** a step that doesn’t added value, but is nonetheless required because of regulations or as a pre-requisite to a value-added step
Lean Fundamentals - Waste

**DEFECTS**
Creating, finding, fixing errors

**EXCESS / INAPPROPRIATE PROCESSING**
Unnecessary or complicated steps, unclear guidelines

**OVERPRODUCTION**
Unneeded info, excess quantity, doing work not requested

**WAITING**
Time for approval, waiting for info or decisions, waiting for people in meetings

**MOTION**
Trips to different work areas, walking to find supplies

**INVENTORY**
Backlog, WIP, excess materials, obsolete files

**NON- OR MIS-UTILIZED TALENT**
Competencies underused/overused

**TRANSPORTATION**
Paper routing, transportation of docs, doc storage
Lean Fundamentals - Waste

Streamlining Processes: Address “Non-Value Adding” Activities

Results: 25% improvement in Non-Value-Added time, with 22.5% reduction in total cycle time

90% of total cycle time

NVA time

67.5%

NVA time

10%

10%
Flow means to “move along in a steady, continuous stream.”

- Eliminate bottlenecks or interruptions that slow down progress.
- Strive for continuous flow as opposed to batching, stock piling in queues, or waiting.
- Seek flow from customer request to customer delivery.
Improving Flow and Delivering Greater Value to Customers

- Looks at a process or operation “end-to-end”
- Identifies sources of inefficiency, delay, disruption
  - *Obstacles to smooth, effective “flow” = waste*
- Targets highest potential opportunities
- Applies a variety of techniques, principles and tools to improve efficiency, shorten lead times, increase capacity and flexibility
- Requires challenging assumptions, looking at things in new ways, working as a team
Takt Time = rate at which the customer PULLS from you.

If you receive 1 order per day, you should produce one widget per day. If you receive 10 orders per day, you should produce 10 widgets per day. Each widget may take 100 days to manufacture (cycle time). There will be multiple process steps/tasks along the production pathway, each step will vary in its completion time.

\[
\text{Takt} = \frac{\text{Total Available Working Time per Day (in seconds)}}{\text{Total Units Pulled by the Customer in that same Time Frame}}
\]

Example:
- 60 x-ray patients per day
- 6.5 hour work day (6.5 hrs x 60 mins x 60 secs)
- 23,400 seconds per day in that work day

\[
\frac{23,500 \text{ seconds}}{60 \text{ patients}} = 390 \text{ seconds (6.5 mins)}
\]

In order to keep up with the demand, we must complete an x-ray every 6.5 minutes i.e. Takt Time = 6.5 minutes.
A structure to manage the change, continuously improve daily work, and sustain changes.

- Kaizen
  - a. Commit to continuous improvement
  - b. Develop Lean Thinking
- KPIs that matter
  - a. Process measures
  - b. Outcome measures
- Visual Management
  - a. Accountability to KPIs
  - b. Problem solving
  - c. Flow, Pull, Demand
- Daily processes
  - a. Standardized
  - b. Sequenced
  - c. Tools
  - d. Best practices
- Leadership
  - a. Huddles
  - b. Problem Solving
  - c. Change Management
Clearly defines boundaries/scope

Identifies major outcomes and activities

Avoids over-detail, confusion

Helps plan and target measurement

Focuses cross-functional alignment and analysis

“Bird’s-eye view” of a process:
“Incremental” Improvement

1. Identify/Select specific pain or gap in results
2. Investigate and pinpoint targeted waste or causes
3. Develop and implement focused solutions
Facts About Processes

AMAZING but true...

There are several versions:

• As “supposed to be”
• As-is (Current state)
  • Should be
• Could be (Future State)

Usually, simpler is better

They tend to GROW
Levels of a Process

**New Product Development Process**  “LEVEL ONE” (L1)

- **PRODUCT EVALUATION & PLANNING**
  - **INITIAL DEVELOPMENT**
  - **TEST & TECHNICAL VALIDATION**
  - **CUSTOMER VALIDATION**
  - **PRODUCTION & LAUNCH**

“LEVEL TWO” (L2)

- Develop Product Concept
  - Assess Market & Potential
  - Prepare Budget & ROI Plan
  - Gain Product Approval

“LEVEL THREE” (L3)

- Formulate Research Plan
  - Conduct Market Research
  - Conduct Competitive Analysis
  - Refine Product Concept

“LEVEL FOUR” (L4)
Detailed Process Mapping

*A graphic representation of the flow of tasks, decisions, and pathways in a process:*

- Standard map or “flowchart”
- Cross-functional or “swimlane” map
Basic Process Map (flow chart) – example

1. **Incoming Chat inquiry**
2. **Send Greeting (Auto Reply)**
3. **Check CSR Availability (queue system)**
   - **YES**
   - **NO**
   - **Send “Please Wait” note (Auto Reply)**
4. **Greet & Ask Name (CSR)**
5. **Identify Customer Objective (CSR)**
6. **Verify Request & Objective (CSR)**
   - **CLEAR**
   - **UNCLEAR**
7. **Provide Response or Referral (CSR)**
8. **Thank & End Chat (CSR)**

Legend:
- Start and End points
- Task or activity
- Decision or review
- Direction of workflow
Sale to Implementation (High level example)
Detailed Mapping Benefits ...

- Provides a “picture” of simple or complex processes
  - Helps focus on how work is really done (As-Is)
  - Allows others to better understand your process
  - Shows connections and dependencies: Supplier/Customer, Upstream and Downstream

- Helps determine what and where to measure

- Essential to clarifying issues and finding root causes
  - How work is done and why will explain the cause

- Key to planning for new or improved processes
Lean Tools - Developing Hypotheses (educated guesses)

Methods We’ll Cover

- **Cause & Effect Diagrams**
  - Applying experience and collective thinking

- **The 5 Whys**
  - Working back the “causal chain”
Problem Statement:
Payment not applied to the correct account

POSSIBLE CAUSES

Each “bone” is a hypothesis!
Lean Tools - Cause & Effect:
Possible “Causes of Causes”

1. Payment not received
2. Sent to wrong address
3. Instructions unclear

Old address on envelopes
Lean Tools - The “Five Whys” Method

- Ask questions, work back to most relevant cause(s) or trigger
- The further “upstream” you can go, the greater the potential benefit of the solutions
  - Prevention vs cure—but avoid trying to “solve world hunger”
- Look for linked causes, too — two or more factors that combine to cause the problem

Problem:
Increase in transportation costs for July

Why? 
High use of air freight

Why? 
Delays in Large Orders

Why? 
Order data is missing

Why? 
Recent product changes

Why? 
Stricter regulatory climate

Why? 
New Service Center opened May

Why? 
Suspect new staff & system (??)

Why? 
High use of air freight
Lean Tools – Priority Matrix

A. Poor space utilization in buildings
B. Purchasing system errors
C. Accounting errors
D. Inventory systems do not match physical counts
E. Increasing damages with shipped materials
F. Obsolete marketing materials being used
G. Website is not user friendly
H. Employee turnover is too high
I. New product development takes too long
J. Mergers & Acquisitions is too complicated
K. Increasing customer complaints on production materials
L. Office supplies costs are increasing
Lean Tools - Why Scope is Important …

Leaders & sponsors think: “They can do this.”

Team considers and thinks: “We can do this.”

Reality and time reveal: “You can do this.”
Scope: What’s in/What’s Out

1. State what’s to be accomplished, analyzed, discussed—or what’s in scope

2. State what’s NOT to be accomplished, analyzed, discussed—or what’s out of scope

Remember & balance the “2 Ms”: Meaningful & Manageable
Lean Tools – Visual Management “Dashboard”

VITAL $X_s$
- Number of Products
- Manufacturing Standards
- Budget

Process
- Sales per Product
- Sales/Month
- Customer Satisfaction
- Defects/Month

CRITICAL $Y_s$
- Sales Rates
- Return Rates
- Total Cost/Sales

Input
- Number of Products
- Manufacturing Standards
- Budget

Output
- Sales Rates
- Return Rates
- Total Cost/Sales

Dashboard
- Cycle time
- Order fill rate
- Inventory turns
- Rework levels

1 - 35
Lean Tools – Performance Measures

Types mentioned or covered so far …

In-Process Measures (Xs)
- Task cycle time
- Takt time and takt rate
- WIP and Inventory levels
- Labor per activity
- Internal Cost of Poor Quality

Overall/Output Measures (Ys)
- Total Lead Time
- Total Cost of Poor Quality
- Yield (percent meeting specs)
- Total cost per unit/activity
- Customer satisfaction level
Lean Tool – Visual Management

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Questions & Next Steps