Conducting Operation Reviews

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Main Focus of the Presentation

To describe when and how to do an Operations Review

747 airplane in Final Assembly

Presentation Outline

- What is an Operations Review?
- When do you do one?
- Where do you do one?
- Who would do one?
- How do you do one?
- Some typical results from four Boeing case studies
- Lessons Learned

What is an Operations Review?

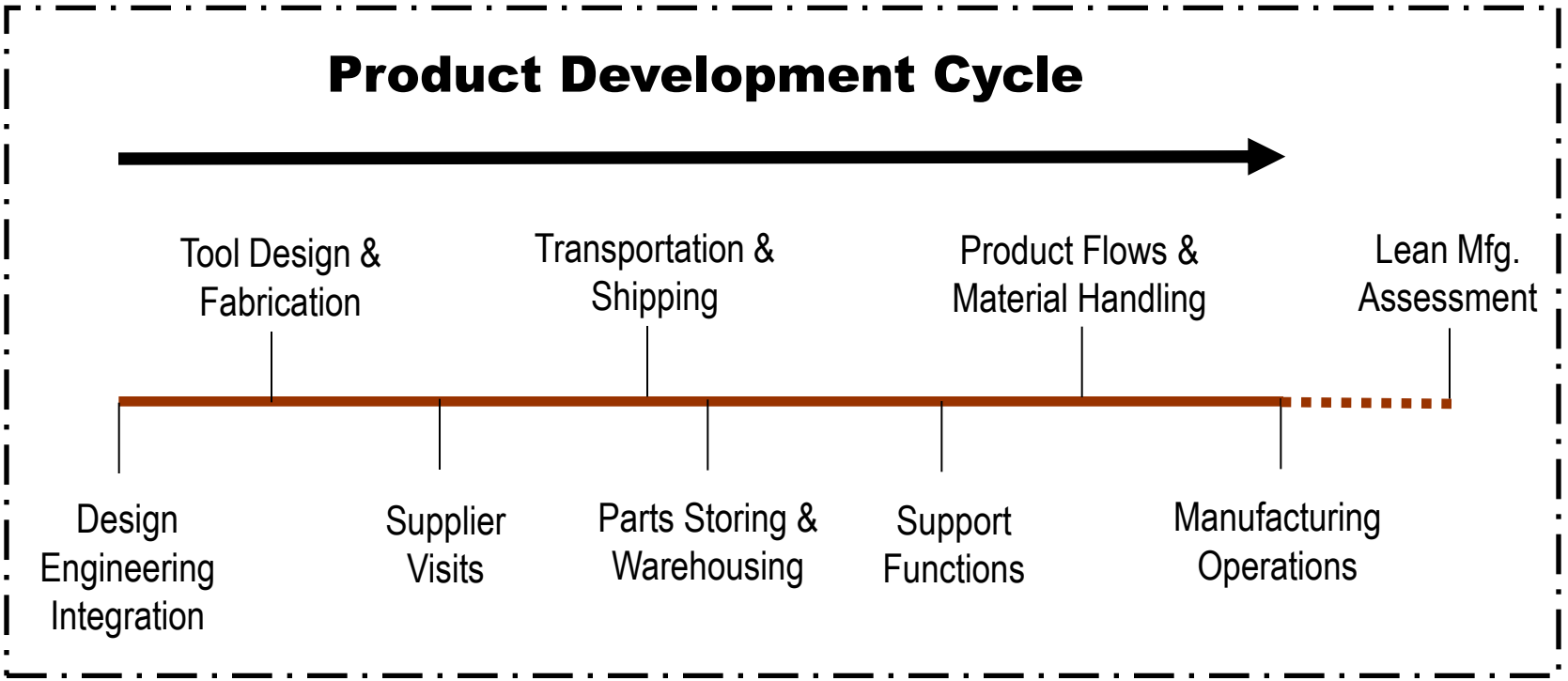
- Definition: ***"An initial review or survey of the existing operations components or manufacturing activities of a product, department, plant, or division."***

- May be the first step in performing an overall, operations improvement
- Can also be a stand-alone assessment

When do you do an Operations Review?

- Whenever an Operation is having a variety of problems and a recovery plan is needed
- Whenever major changes of a general nature are being considered
- Whenever comparing current progress to past performance

Where do you do an Operations Review?



- **At Boeing, we have performed Operations Reviews in each of the areas above, including a Review of the entire Product Development Cycle.**

Who would do the Review?

- An individual or a small Team, depending on complexity and time requirement
- An Industrial Engineer with some Lean Mfg. and Project Management training
- A Subject Matter Expert, if a specific or technical area involved in the Review (part of the Team formation)

How do you Perform the Review?

Methodology:

- **Develop an Objective (*** *a tips slide follows*)
- Form a Review Team
- Develop an Approach and **Scope ***
- **Tour the existing Facilities ***
- Document Observations
- **Interview for Information ***
- **Perform Data Gathering ***
- **Benchmark similar Operations ***
- **Prepare Findings & Conclusions ***
- Identify any Improvement Opportunities

How do you Perform the Review? (continued)

Developing an Objective & Scope tips:

- Meet with the requesting customer to discuss the Operations Review and to understand current conditions
- Write a broad Objective of what is to be studied, and review it with the customer
- Develop the boundaries of what is to be included (the Scope of the Review), and discuss it with the customer

How do you Perform the Review? (continued)

Operations Tour tips:

Before

- Identify & contact a tour guide
- Try to get a layout drawing
- Try to get an organization chart with key names & departments

During

- Follow the Product Flow from beginning to end
- Have the entire Team take the tour
- Ask questions throughout tour
- Observe everything and take detailed notes

After

- Huddle with the Team (same day or next day) to compare notes
- Write up the group's tour observations

How do you Perform the Review? (continued)

Informational Interview tips:

- Set up interviews ahead of time (if possible)
- Check the interviewee has experience in the function
- Prepare some starting questions ahead of time
- Let the person being interviewed finish their answers
- Ask follow-up questions, as needed, to finish a topic
- Ask who else you should talk to

How do you Perform the Review? (continued)

Data Gathering tips:

- Start the data gathering activity as early as possible
- Look for existing data that describes the Operations
- Identify the need & a plan for any new data collection
- Check and verify all data to be used

How do you Perform the Review? (continued)

Benchmarking tips:

- Understand your current process or activity first
- Determine who best to benchmark
- Plan each trip well ahead & prepare good questions
- Take along the entire Team
- Observe similar processes at each visit
- Take detailed notes & digital pictures (if allowed)
- Discuss observations afterwards as a Team

How do you Perform the Review? (continued)

Summarize Findings tips:

- Do some preliminary documentation of findings as the Review proceeds (particularly end of day discussions)
- Make an ongoing list of positives and negatives
- Group items into similar areas of interest
- Use observations, data & digital pictures to verify findings
- Summarize findings & list any process improvements

What are Some Typical Boeing Case Study Results?

- Case Study #1 – **Lean Manufacturing Assessment**
- Case Study #2 – **Field Operations Review**
- Case Study #3 – **Bulk Parts Flow**
- Case Study #4 – **Ergo Surveys Review**

Boeing Case Study #1
Lean Manufacturing Assessment (LMA)

- **Operation:** A program wide, Lean Manufacturing Assessment (LMA) of all 747 Operations, including main support groups.

- **Objective:** An assessment score of several 747 program's critical areas, to compare against last year's Lean Mfg. Assessment and other airplane programs' scores, and industry best score.

Boeing Case Study #1
Lean Manufacturing Assessment (LMA) (continued)

- **Methodology:**
  - Formed Assessment Team and reviewed last year's results
  - Sub -Teams developed a review plan & data collection plan
  - Sub -Teams conducted individual assessments & rolled-up combined findings
  - All supporting data was provided & checked for validity
- **Results:**
  - An overall program level assessment & a detailed assessment of each area being reviewed
  - A summary presentation of findings & any improvement opportunities to Senior Management
  - This resulted in an "action plan" for each area assessed – and was worked over time

Boeing Case Study #2
Field Operations Review

- **Operation:** 747 Field Operations of Entry-Into-Service airplanes, following new model, Flight Tests.

- **Objective:** Review 747 Field mechanical & electrical installation activities, for any process improvements.

Boeing Case Study #2
Field Operations Review
(continued)

- **Methodology**:
  - Met with key production and support groups and set up direct observations of Field mechanics & electricians to understand current issues
  - Discussed observations and any held-for conditions with all support groups
  - Discussed possible process improvements with affected groups
- **Results**:
  - A list of related observations, with possible solutions
  - Key focus areas for follow-up process improvement activities
  - A Report-out to the Senior Management group, with a variety of findings & actions, such as: a new recovery plan for each airplane, better parts control, and more tool kits

Boeing Case Study #3
Bulk Parts Flows

- **Operation:** Large, bulk parts receiving, in-plant transport, storage, and point-of-use for 747 assembly.

- **Objective:** Develop an improvement plan for main bulk parts flows for 747 airplanes (engines, ray-domes, flaps, landing gear, gear doors, etc.). Covers entire parts flow from initial receiving to usage on airplane, and return of any shipping containers or transport tooling.

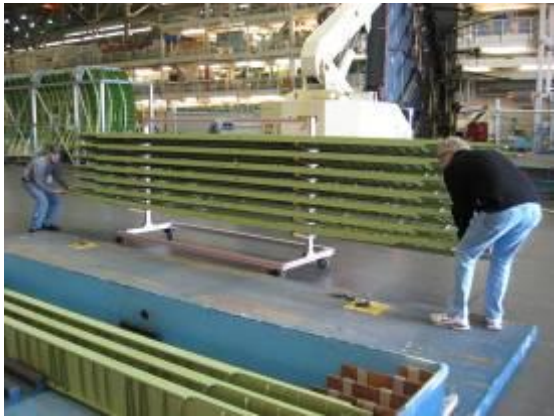
Boeing Case Study #3
Bulk Parts Flows
(continued)

- **Methodology**:
  - Met with Bulk Parts Handlers and toured the site
  - Documented flow process from receiving to point-of-use, for all large, bulk parts (with digital pictures)
  - Benchmarked best processes for each parts flow
  - Developed improvement plan for each route & handling activities
- **Results**:
  - Flow charts & digital pictures of all large, bulk parts
  - Improvement plan for reducing storage & transport time, including return of transport tooling (“rotable” tools)
  - Each bulk parts process flow was significantly improved with fewer delays, better communication, and more controlled staging of parts near the airplane point-of-use

Boeing Case Study #4
Ergo Surveys Review

- **Operation:** Review previous Ergonomic surveys done in-house for the 747 airplane program's parts support organization.

- **Objective:** Screen all ergo surveys, develop an ergonomic mitigation plan that covers the groups that receive & handle parts for 747 airplane factory assembly.



Boeing Case Study #4
Ergo Surveys Review
(continued)

- **Methodology:**
  - Printed out all ergo surveys & met with survey originators
  - Toured all areas involved, to see current conditions
  - Discussed conditions and possible mitigations with a Boeing Ergonomist & benchmarked conditions on 767 & 777 airplanes
  - Developed a worksheet to record common conditions, risks & built a mitigation plan

- **Results:**
  - Organized grouping of all surveys, based on similar ergo risk conditions
  - Status of any previous mitigations already performed
  - Mitigation plan and schedule for resolving all ergo survey conditions found (in blocks of similar conditions)

Some Lessons Learned

- An Operations Review can be very helpful in documenting the “big picture” of a large or small operation
- It also can be useful for an integrated product flow and detailed process improvements
- Interview the right people & use good interviewing skills
- Use some basic Project Management techniques to stay focused & on schedule
- Document Observations & Findings as you go, including saving digital pictures
- Look for opportunities to do benchmarking (both of similar problems, as well as, viable solutions)
- List all operational strengths & weaknesses