

Boeing Co. Industrial Engineering Case Studies

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Retired, Industrial Engineers
Boeing Commercial Airplanes

Boeing Case Studies

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

Boeing Case Study #1

Field Operations Review

- **Operation:** 747-8 Field activities for Entry-Into-Service airplanes, following new model, Flight Tests.
- **Objective:** Review 747-8 Field mechanical & electrical installation activities, for any process improvements.



Boeing Case Study #1

Field Operations Review (continued)

- **Methodology:**
 - Met with key production and support groups and set up direct observations of Field mechanics, electricians & parts support activities, to understand current conditions & any problems
 - Discussed observations and any held-for conditions with all support groups & analyzed re-work data for several airplanes
 - Discussed possible process improvements with affected groups
- **Outcomes & Results:**
 - A list of key observations, with potential improvements
 - Key focus areas for follow-up process improvement activities by IEs
 - Report-outs to the Senior Management group & IE group, with a variety of findings & actions, such as: a new recovery plan for each airplane, better parts control, and more Field Ops. tool kits

Boeing Case Study #2

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 #2

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 #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 all 747 factory airplanes (engines, ray-domes, flaps, landing gear, gear doors, etc.). Covers entire parts-flow from initial on-site receiving to installation on airplane, and return of any shipping containers & transport tooling.



Boeing Case Study #3

Bulk Parts Flows

(continued)

- **Methodology:**

- Met with Bulk Parts Handlers, Material Handlers, & toured the site
- Documented flow process from receiving to installation, for all large, bulk parts (with digital pictures)
- Benchmarked best processes for each parts flow (with 767 & 777)
- Developed improvement plan for each route & handling activities

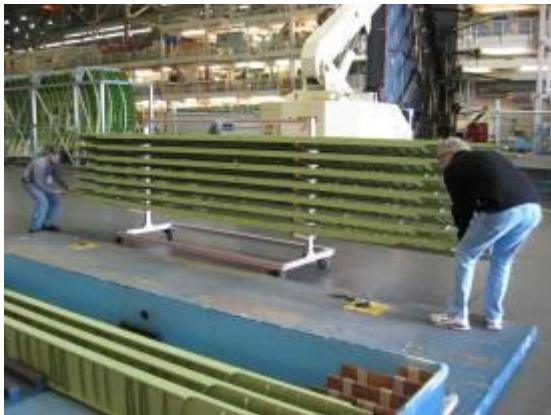
- **Outcomes & Results:**

- Created Flow charts with digital pictures for all large, bulk parts
- Developed an Improvement Plan for reducing storage & transport time, including the return of transport tooling
- Each bulk part's process flow was significantly improved with fewer delays, better communication, and more controlled staging of parts near the installation on 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 all 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, and anything already mitigated
- Discussed conditions and possible mitigations with a Boeing certified Ergonomist & benchmarked similar conditions for 767 & 777 airplanes
- Developed an excel worksheet to record common conditions & risks, and built a separate mitigation plan for each unresolved condition

- **Outcomes & 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 remaining ergo survey conditions (in blocks of similar conditions)

In Summary

- Spend time at the beginning of each new project, to develop a good project plan, in order to have a successful project
- Review your Objective & planned Methodology with your Internal Customer, before starting any detailed project activities
- Focus considerable effort on the Outcomes & Results for each type of project