ASC ENGINEERING FACT SHEET

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C-17 Monolithic Cargo Floor

DESCRIPTION

The cargo floor assembly of the C-17 aircraft is a very complex structure that encloses the Aerial Delivery System (ADS) rails. These rails run the entire length of the floor and provide the hold-downs for the cargo as well as the ability to release pallets for in-flight delivery. The original design was adequate in service but was difficult to manufacture. The C-17 program was suffering from highly excessive production costs associated with this assembly in the form of increased span time, high touch labor, and

SUMMARY

Problem:

- The C-17 program was experiencing excessive production costs associated with the cargo floor assembly. The span time, as well as the touch labor hours, exceeded the amount of standard time allocated to this particular assembly. In addition, the floor was incurring excessive rework and repair costs.

Solution:

- A team including representatives from the contractor, the SPO, and DCMC was put together to study the root cause of the problem. The team identified many design-related manufacturing features of the floor that were the primary cause of the problems in production.
- The team was augmented with design engineers and began the task of redesigning the cargo floor using "design for manufacturing/assembly" (DFMA) techniques. The result was a new design that greatly reduced the costs of manufacturing the floor for the C-17 aircraft.

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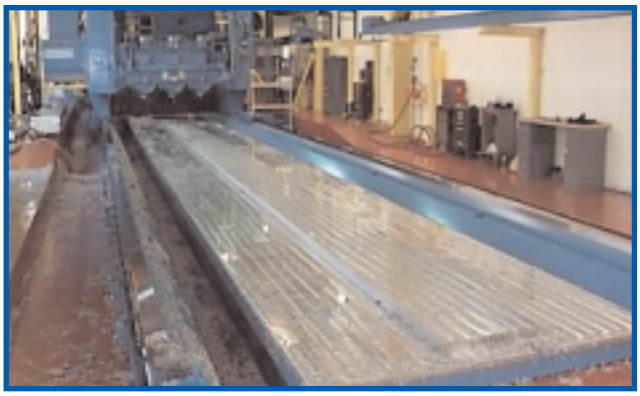
excessive rework and repair with each aircraft. The team assembled to study the problem revealed most of the cost drivers were due to poor design from a manufacturing standpoint. A redesign effort was begun and the cargo floor was completely redesigned under the "DFMA" concept. The results have been impressive:

- Entire floor was changed to "monolithic" construction
- Largest monolithic aircraft structure produced by Boeing:
  - 11,000 lb. aluminum plate raw stock
  - 857 lb. final weight
  - 68 feet long
- 91% of structural parts eliminated
- 73% of fasteners eliminated
- Overall floor weight reduced by 111 lbs.
- Assembly span time reduced 26%
- Approximate savings of $300k per aircraft



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