

# Republic Airways Realizes Productivity Gains | Case Study

## Client

› **Republic Airways**, a Midwest-based regional carrier that operates flights for companies such as American, Delta, US Airways, Continental, Midwest Airlines and United.

## Challenge

› Improve the scheduled maintenance process to reduce the amount of time an aircraft spent in the maintenance cycle. Reducing the maintenance cycle by five days was the equivalent of adding an aircraft to the fleet, which represents \$1 million that could be in the air generating revenue.

## Solution

› TBM and client managers implement lean and conduct business process kaizen events to maintain safety while reducing overall maintenance cycle time with standard work, work load leveling and 5S.

## Results

The airline was able to remove one full day from its C-check (heavy maintenance) process. The lean transformation is being completed in phases, and the results presented here are from the first phase of work undertaken.

## A Regional Air Carrier Implements Lean and Kaizen To Decrease Maintenance-Related Cycle Times and Logistics Costs

Airlines are required to regularly take aircraft out of service for scheduled heavy maintenance, a requirement that isn't taken lightly in these safety-conscious times. Heavy maintenance, known as C-check, can remove an aircraft from service for anywhere from five days to two weeks.

The kaizen process was executed in phases. The initial part of the work focused on the open up and inspect process, looking at how long it took to open up the aircraft and get it cleaned and inspected and ready to move into the repair phase. This was basic kaizen work that involved a lot of 5S, establishing visual controls and improved parts management to help drive productivity. In this phase, the company's goals were to review and map the current-state process, reduce "open up" lead time and develop a performance management process. The results obtained during this first phase showed the promise of future gains through continued application of lean tools and kaizen.

### Physical Fitness Report

The first step for addressing C-check efficiency was to map the current state and identify problems and wasteful practices. Among the issues that caused increased costs and reduced efficiency were:

- Excess walking during "open up and close" process
- Parts storage (including risk of damage to parts and time spent finding parts)
- Time spent locating tools
- Cannibalization of parts
- Time spent cleaning the aircraft—varying definitions of "clean"
- Time required to label parts—a necessary non-value-added process
- Lack of or poorly defined standard work
- Missed defects (i.e., defects that were found at close)
- Lack of metrics
- Mechanic turnover and new mechanic training

Additionally, the process had just a 77 percent on-time record while at the same time logging an average of 350 hours of overtime every two weeks.

# Republic Airways Realizes Productivity Gains | Case Study

## A Kaizen Prescription: Create Maintenance and Repair Efficiencies

### The kaizen team:

1. Created a 5S-driven visual workplace with a new set of racks and rolling containers that were labeled and stored by aircraft section. Parts that were previously removed and stored in random order were removed and organized into a new set of racks and rolling containers that were labeled and stowed by aircraft section. When it was time to reassemble the aircraft, all anyone had to do was work in reverse order through the same racks and bins to quickly and easily find needed parts for the appropriate section of the airplane.
2. Created a "Safety, Quality, Cost, and Delivery" (SQCD) board on which they recorded both planned and unplanned work hours, how many "squawks" (rejects) were found on a particular aircraft and what the maintenance cycle time was. The result was a one-day reduction in the amount of time an aircraft spent in the maintenance hangar or \$200,000 in lost revenue. The team is one step closer to the overall goal of reducing maintenance time by five days—the equivalent of \$1 million that the company could earn if the airplane could be utilized sooner.
3. Conducted a business process kaizen (BPK) to address parts movement and replenishment at overnight bases for standard maintenance performed during overnight "rest" periods. This was a major step toward reducing the expense of quickly transporting parts to where they were needed. One reason overnight bases were running out of needed parts was a lack of timely ordering of those parts.

Less time spent walking around and looking for parts.

Aircraft now spends one day less in maintenance hangar.

By taking a segmentation approach and assigning different parts ordering to different people or groups, the company was able to start turning purchase orders daily.

Table 1: Check Kaizen Results

Kaizen Focus	Improvement Percentage	
	Target	Actual
Open/close-up walking time	50%	66% reduction
Time spent locating parts	50–75%	>80% reduction
Floor space (ft <sup>2</sup> )	50%	35% reduction
Lead time (open/close-up)	20%	22% reduction

### Taking Off

Savings in walking time, parts location, and lead time mean that maintenance crews need to put in less overtime, while also getting aircraft through the repair process more quickly and efficiently. This means that more aircraft can be serviced in one location and that the aircraft are in the air longer, which means greater revenue for the airline. If this one company can gain this much from those first small steps on a lean journey, imagine how high it can fly once lean becomes a way of life.

