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# Case Study

## Lean Manufacturing, MRO and Engineering

### Hill Air Force Base Lean Transformation

#### Client

Ogden Air Logistics Center

#### Location

Hill Air Force Base,  
Ogden, Utah

#### Project Completion

Majority of work completed in  
2008

#### Role of Criterion Team

- Subcontractor to CH2M HILL
- Lean Outcomes Architecting
- Lean Transformation Master Planning
- Lean Training
- Human Change Management
- Program Execution

#### Project Highlights

- Reduced operating costs by a minimum of **20%**
- Achieved **46%** reduction in cycle time
- Produced a **34%** increase in chargeable hours with **17%** fewer staff (through attrition)
- Created **10%** facility free space within existing area
- Realized **60%** reduction in inventory carrying costs
- Reduced worker chromium exposure

The Ogden Air Logistics Center (OALC) in Ogden, Utah implemented a program to improve the entire production operations of the Maintenance, Repair and Overhaul (MRO) center at Hill AFB. This five-year transformation program, awarded to CH2M HILL in October 2004, involves the maintenance, repair and overhaul of wheel and brake assemblies and landing gear assemblies (MANL) for 70% of the aircraft currently operated by the US Air Force.

The Air Force awarded CH2M HILL an Indefinite Delivery / Indefinite Quantity (IDIQ) contract valued at \$50 million to provide professional services as well as procurement, engineering and construction services for the complete Lean Transformation of the MANL MRO complex.

CH2M HILL chose Criterion as a subcontractor on this project. The Criterion team was involved in a substantial portion of this program.

The scope of work included the development of a Lean Transformation phased master plan and an integrated Lean Transformation schedule, accomplished through the application of a unique Lean Outcomes Architecting approach. Key components of this approach included the alignment of the Lean Transformation program to an overarching strategic plan and the implementation of a highly effective human change management system.

The program also included Lean Transformation through the application of system-wide Lean manufacturing tools for the MRO Center's three weapons systems lines and supporting functions, such as:

- Wheels and brakes production line, consisting of four current and one supply/support work cells
- Fighter aircraft production line, consisting of five current and one supply/support work cells
- Cargo and heavy bomber aircraft production line, consisting of six current and one supply/support work cells
- Heavy lifter aircraft production line, consisting of five current and one supply/support work cells
- Plating and manufacturing production line, consisting of three current and one supply/support work cells

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The weapons systems lines were modified to focus on production processes for similar part families to leverage skill sets and available processing equipment. The plating operation was evaluated and augmented with high velocity oxygen fuel (HVOF) operations to reduce chromium exposure issues and improve first pass quality yield for metal deposition processes.

In addition, the program included:

- Comprehensive strategic planning / human change and MRO Lean Transformation training workshops, incorporating both vertical integration (from base leadership to second line supervisors) and horizontal integration (all direct and support functions) of workshop participants
- Management and work force staff Lean mentoring
- Detailed Lean work cell designs supporting the new Lean operations for each production line and work cell
- The design of the necessary facility and utility modifications to support the new Lean operations along with construction documents
- Complete specifications for all process equipment refurbishment and new equipment procurement
- Process equipment relocation, installation and startup