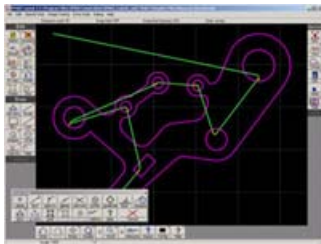


## OMAX Water Jet Cutting Machine

**Challenge:** The Metals Technology and Structural Maintenance sections in the 6 MXS at MacDill AFB are responsible for structural repairs on 16 KC-135R/T aircraft and 283 aerospace ground equipment assets. They also provide capabilities for other agencies in the Tampa Bay area to include CENTCOM, SOCOM, JCSE, NOAA, Coast Guard, and Marine units. In November 2007, the Metals Technology section from the Maintenance Squadron re-evaluated their manufacturing processes with the intent to optimize base level fabrication capabilities. The section proposed a new cutting edge machine which could potentially enhance productivity and reduce material waste. This machine is the OMAX Water Jet Cutting Machine.

**Objective:** With the OMAX, in conjunction with the section's current technology, they expect to double their parts manufacturing capacity and maximize output and effectiveness by reducing wasted material and man-hours.

Layout is the OMAX program that lets you draw the part you want to make.



**Summary of Events:** MacDill submitted a business case analysis for the OMAX machine in the 2nd Quarter of FY08.

**Results:** MacDill was provided funds by HQ AMC to acquire an OMAX 55100 water jet cutting machine for \$223K. This hi-tech piece of equipment removes material through erosion by introducing a concentrated high-pressure water stream with fine sand particles. There are no blades or drill bits, just water which can cut virtually any 2-dimensional shape from a sheet of steel up to 6 inches thick. The major benefits realized from this technology include scrap material savings and reduced programming setup times. The OMAX has the unique capability to cut closely nested shapes from one piece of metal which reduces scrap material by approximately 40 percent. Additionally, programming and setup time is reduced by as much as 80 percent. This is also an environmentally friendly process since it operates on a closed loop system, which does not introduce any new contaminants into the environment. According to an extensive cost analysis, the MXS will save up to \$36,000 annually once this machinery is implemented. With the monetary savings alone, the machine will pay for itself in less than 6 years.

## MAF KC-135 Periodic Inspection Recast

**Challenge:** Provide a Standardized Aircraft Periodic Inspection (PE) Flow process for use at 32 Active Duty, Air National Guard and Air Force Reserve KC-135 units.

**Objective:** Bring AD, ANG, and AFRC KC-135 maintainers to a single location to solidify past RIE findings and individual unit best practices. The ultimate goal was to provide an end-state to individual PE RIEs by: standardizing aircraft input conditions; identifying the best tools, support and safety equipment; eliminating redundant inspections; standardizing inspection flow; and validating minimum inspection card item time requirements. This end-state puts the right tools, people and processes in place to enable units to perform focused PEs and it requires less aircraft down time—MAF wide.



**Summary of Events:** Field units in all commands have performed no less than 7 PE RIEs since 2002. Each event aimed to improve the PE process by streamlining major aircraft inspections. HQ/AMC KC-135 Weapons System Managers and the 126th ARW's Maintenance Group invited AMC, ACC, AETC, ANG, and AFRC maintenance units to meet at the 126th ARW at Scott AFB IL from 8-21 Jun 08. As soon as the aircraft taxied to parking, all maintenance specialists walked around the aircraft to assess aircraft conditions. After an in-brief and a review of PE Recast goals, this Total Force Team of 40 seasoned SNCO and civilian maintainers performed both #1 and #2 PEs

simultaneously on one of the highest airframe time KC-135s in the active duty inventory. Having been heavily modified and reconfigured throughout its life, this special mission capable aircraft presented both structural and technical challenges. This ensured technicians and tech data were tested to ensure nearly all possible airframe and system conditions were validated. On-site representatives from the 550th Aircraft Sustainment Group (KC-135 SPO) and Boeing provided immediate resolution to questions concerning tech data intent, work-card requirements, and life-cycle maintenance data indicators. The team also walked through 49 AFTO Form 22 tech order change requests from prior RIEs and approved 27 for immediate implementation. Examining ongoing maintenance throughout the PE process allowed the team to identify conflicting inspections and maintenance requirements that cause some AF specialties to be waiting on other AFSCs or aircraft conditions in order to perform their specific PE tasks.



**Results:** The PE look-phase was completed in just three 10 hour shifts! Follow-on repairs and heavy maintenance were completed in just 7 days of 1 shift per day. The team identified wing, fuselage and tail maintenance platforms that will reduce time spent repositioning stands for inspections by 5 people times 8 hours per aircraft PE. Those stands can also be adapted to store removed panels, special tools, and consumable hardware, which drastically reduces time mechanics spend chasing items. The SPO is reviewing a concept to replace 30 flap gearbox servicing plugs with sight gauge-type plugs. If approved, that single change will save approximately 12 additional hours per PE. Investigation into spoiler bolt lubrication

requirements revealed that new bolts are installed every PDM. Thus, maintainers no longer need to remove, lube, and reinstall spoiler bolts, saving another 12 hours of work per aircraft. HQ/AMC submitted 3 AF Form 1067 modification proposals to evaluate other time saving initiatives including: removing crew entry door emergency escape spoiler system components, improving gaseous oxygen rack installation and maintenance procedures to allow rack movement without draining oxygen, and using see-through floor boards under the oxygen rack for flight control cable inspections. An ongoing engineering task will produce new landing gear trunion bolts—that effort will virtually eliminate the need to jack aircraft in PE, potentially saving 1 full day per PE! 13 repetitive work card items were eliminated from the PE work-deck, saving 12 hours of maintenance per aircraft. While re-ordering the PE work-cards for best-flow of inspections, the team identified avionics inspections as the area most affected and delayed by other AFSC inspection requirements. The SPO is evaluating a concept to pull all avionics from the PE, and align them as 12 or 18 month special inspections with other current avionics system certification requirements. Consolidating like-system maintenance into smaller HSC style work packages allows system mechanics to perform complete inspection, repair, and operational check-out in one job-event, rather than between competing priority maintenance. The team believes that effort will also save an additional day per PE.

SPO, engineering research and tech order re-writes are on track for a Fall 2008 release. Once drafts work-cards are complete, they will be tested for 30 days at select AD, ANG and AFRC units for validation prior to formal release—projected for Fall 2008.