

# Air Logistic Center Baseline Study

## **Background:**

In August of 1995, the USAF, through WL/MLSS, initiated the Coating Technology Integration Office (CTIO). The purpose of the CTIO was to establish a state-of-the-art facility for testing and evaluation of advanced materials, equipment and processes for aircraft refinishing, and to integrate these advancements and other “best practices” into routine USAF operations. CTIO was tasked with baselining the current status and operations of aircraft surface refinishing facilities at the USAF Air Logistic Centers (ALC) and Major Command (MAJCOM) field units. The purpose of baselining was to gather information on the facilities, equipment, processes and procedures, materials, training, and documentation. The baselining activity was divided into two projects, one covering the ALCs and the other the field units. This project Final Report summarizes the ALC baselining activities.

**Project Sponsor/Customer:** AFMC/CEVV; Air Force wide

**Period of Performance:** Aug 95 - Apr 96

## **Objective:**

The objective of ALC baselining project was to develop integrated products/process test methods for qualification of aircraft coatings, including depainting, surface preparation, and painting processes. The major achievements of the ALC baselining effort include the following:

- Develop a generic process flow chart or diagram with process timing information. Characterize key variables that may influence coating quality. Included a review of record keeping procedures to provide insight into historical coating problems.
- Develop a basic understanding of the typical environmental conditions existing during depaint/ paint processes. Document the process so new coatings can be tested at the on-site extremes required for successful application.
- Document typical coating failures experienced (production problems as well as coating failures after the aircraft has returned to service). Develop screening methods for proposed new coating systems.

- Document process equipment used at the ALCs for standard depaint/paint operations. Enables CTIO to purchase appropriate equipment to emulate on-site processes in their test facility.

Information collected during this project will be incorporated with data from other contract efforts to develop an integrated test method applicable to standard depaint/paint operations and to define the appropriate criteria to measure success. Previous "baselining" of surface preparation procedures accomplished by AFRL and Battelle, as part of the Now Term Program, will not be duplicated. Likewise, previous depaint baselining accomplished by WR-ALC and TRW will not be duplicated.

**Status:**

From a systems approach, the first operation in a coating system is the removal or "depainting" of the old or defective coatings. Four primary processes are used for aircraft production depainting; scuff sanding, chemical stripping, plastic media blasting (PMB), and medium pressure water (MPW) stripping. ALC depainting facilities were found to have adequate capacity and reliability, but improvements in supporting process equipment and temperature controls would be beneficial. Several facilities were in need of modifications to be compliant with impending environmental regulations.

Surface cleaning and treatment processes are deemed by ALC personnel to be the most important production variables affecting coating system performance. However, most painting facilities have modified technical order basic procedures and use additional processing steps to address problems which have been encountered over the years. A number of the chemicals currently in use during the surface preparation process are environmentally undesirable (i.e. some of the wipe solvents and the chromate conversion coatings), and efforts will be now needed to qualify acceptable alternatives.

Significant differences exist in the coating material combinations (primers and topcoats) used for aircraft. In some cases different coating systems are used on a given aircraft depending on where it is recoated. The actual procedures used to apply the coatings are very similar at all of the ALCs, but it was agreed production schedules can cause undesirable changes in the procedure. The facilities were found to be in generally good condition, but most facilities expressed a desire for improved climate control (particularly cooling capability) and upgraded compressed air systems. There have been difficulties

in implementing the newer, more efficient paint guns at all the ALCs, but most have developed an acceptable level of proficiency with their existing guns. Suggestions for further improvements in the operation of these guns were obtained and provided to the ALCs.

Efforts were made to develop as complete and accurate a set of data as possible in compilation of this ALC Baseline Report. Due to the lack of standard USAF source documents for some of the technical areas, specifically related to chemical usage and pollution sources, the data presented were obtained from on-site interviews and questionnaires sent to the CTSC-assigned ALC personnel. The numerical data in this document has also been reviewed with each ALC in an attempt to ensure accuracy. The data in this report will be used in the selection and prioritization of CTIO reliability and maintainability tasks and for developing a metric for evaluation of the effective reduction of pollution sources.

Source pollution prevention has been the impetus behind the recent changes to USAF depainting and painting operations. Significant testing and development challenges remain and were identified during the baselining effort. They are outlined in this report. This report recommends these challenges be addressed by the CTIO and the CTSC to expedite the integration of new, environmentally acceptable materials into daily USAF operations to ensure compliance with the continually evolving environmental regulations.

**Final Report:** Titled: "Paint Spraying Equipment Reliability/Maintainability Improvement Identification Study"

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