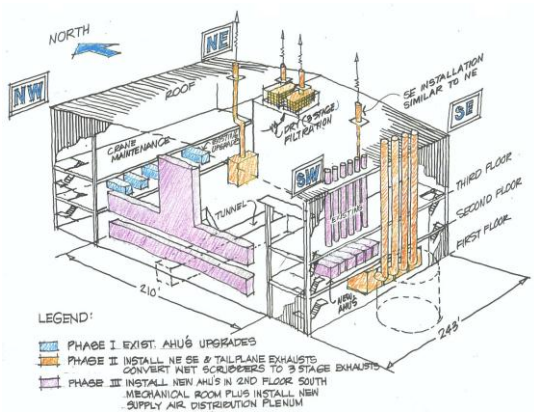
The Boeing Company
Paint Building 58

Austin Services
Feasibility Study
Engineering Services

Location
Long Beach, CA

Facts & Data
50,000 SF Paint Bay
128,000 SF Overall



The Austin Company provided services for The Boeing Company's aircraft paint hangar project – a $6.3 million modernization and complete retrofit of the existing 50,000 SF Building 58 Paint Hangar in Long Beach, California (the overall building is 128,000 SF, including mechanical and support spaces). The project included a comprehensive redesign of the supply and exhaust air systems, including conversion from wet scrubbers to dry media filtration, and the addition of controls for "fully-automated" operation.

Designed and constructed in 1986 (by another firm), Building 58's airflow originally followed a predominantly vertical airflow model, with a majority of the supply air being directed downward from the ceiling and supplemented at the front of the aircraft. Exhaust air was collected via floor grating and tunnel system, configured to follow the pattern of the aircraft fuselage and wings. The facility also utilized a water wash exhaust air filtration system. Since bringing the facility on-line, Boeing had experienced operational difficulties, including clouding, poor particle entrainment, and high concentrations of solvents in the hangar.

With the facility requiring maintenance replacement of major equipment components, Boeing called upon The Austin Company to completely redesign the airflow system to address operating, maintenance and quality problems, as well as to provide for the effective painting of a variety of aircraft types and sizes.

Following evaluation of the existing problems and desired operational objectives, Austin recommended that the hangar be converted, in part, to a horizontal airflow system, with the introduction of a significantly greater quantity of air at the nose of the aircraft, and additional exhausting at the rear of the aircraft. A portion of the exhausting remained through the existing floor grate and tunnel system. In essence, the proposed solution combined features from both vertical and horizontal airflow systems. Austin's engineering team confirmed the functionality of the proposed system through a comprehensive airflow modeling analysis.

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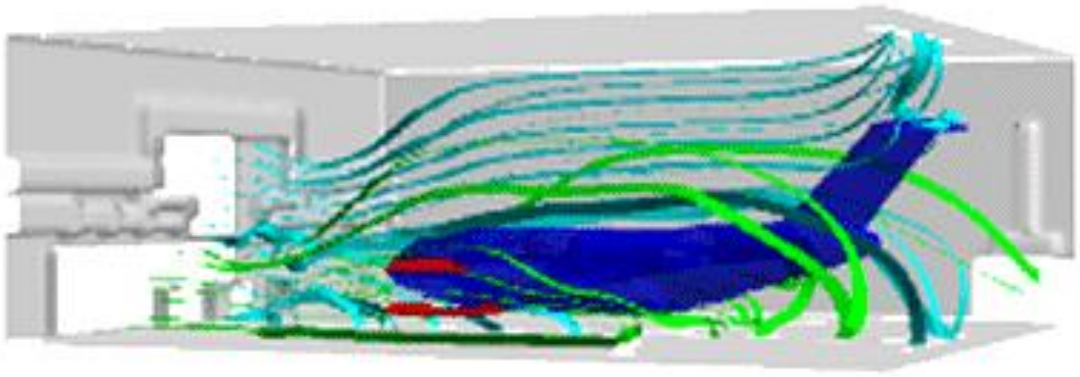

The modeling analysis addressed the airflow, air balance, and operation of the supply air exhaust systems, including the requirements for the supply air and exhaust air plenum segments.

Conversion of the hangar included the addition of supplementary supply air handling units, significant redistribution of the supply airflow, and complete replacement of the exhaust system, including the addition of two exhaust plenums at the rear of the hangar. Exhaust air filtration was completely converted to a 3-stage dry media type with the capability of adding a fourth stage. The new air systems exhaust 350,000 CFM, with the entire system, supply and exhaust, automatically controlled. The total exhaust air requirement can be met even upon the failure of one of the five exhaust fans.

Due to the significant size and weight of the new mechanical systems, extensive structural steel framing had to be installed for support, including an evaluation of wind and seismic considerations. The new steel framing included steel framed towers to support the full height exhaust stacks, elevated steel platforms for the new air handler units, strengthening of the existing roof trusses, and modification to the existing framing for the supply plenum.

This entire conversion took place on a phased basis to allow the hangar to continue to paint aircraft and meet delivery schedules.

The performance of the completed conversion has exceeded Boeing's expectations.