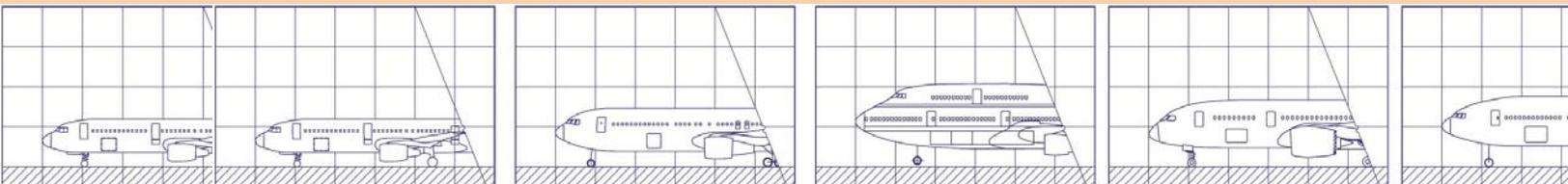


NEXT GENERATION SOLUTIONS

for

AIRCRAFT MAINTENANCE, REPAIR *and* OVERHAUL FACILITIES

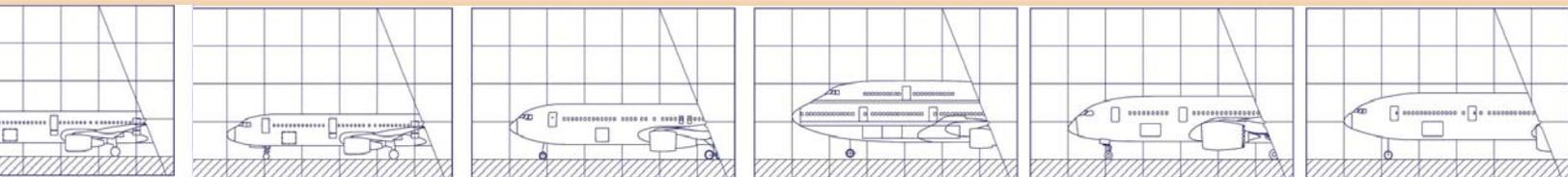


Providing Next Generation Solutions for Aircraft Maintenance, Repair and Overhaul Facilities focused on the need for International Competitiveness resulting from

- ❑ **Changing Fleet Plans**
- ❑ **New Aircraft Types and Technologies**
- ❑ **Logistics Needs including the Aftermarket**
- ❑ **New Systems and Materials**
- ❑ **Quick Turn Requirements**
- ❑ **Global Alliances**
- ❑ **Improved Dispatch Reliability**
- ❑ **Increased Asset Utilization**

Achieved as a result of an integrated facility development methodology which integrates; operational, information technology, organizational, building, equipment and site requirements

Both capitalizing on existing strengths, and seeking areas for further improvement while creating new facility solutions





Line Maintenance



Widebody Heavy Maintenance



Light Maintenance



Airside and Landside Needs

THE NEED TO ACHIEVE INTERNATIONALLY COMPETITIVE SOLUTIONS

The challenging world economy, with its focus on competitive solutions, requires an understanding of operational technical and business issues.

These utilize new concepts and techniques to achieve solutions that are both financially viable and economically justifiable.

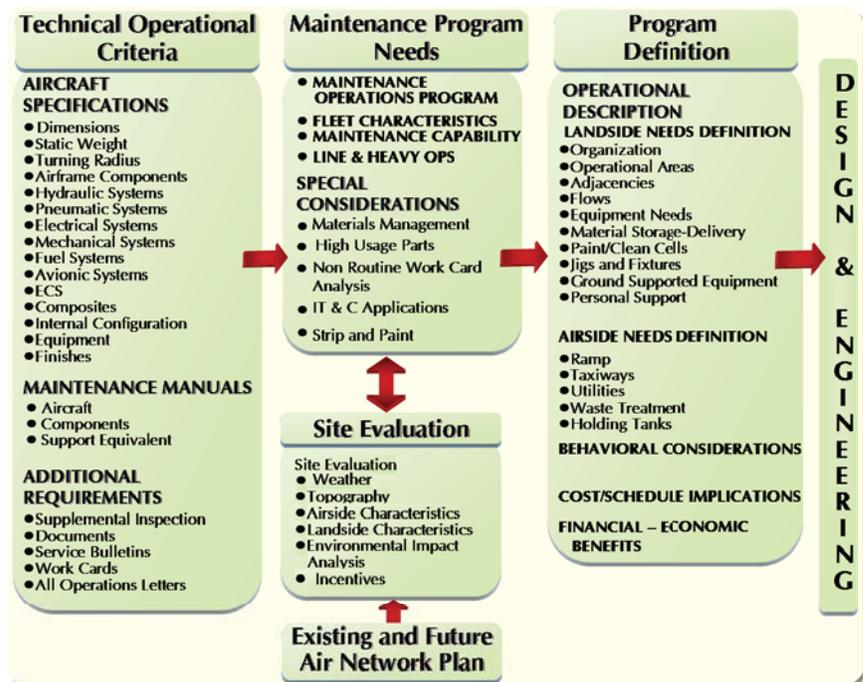
This is relevant to the redevelopment and expansion of existing facilities, in addition to the creation of new ones.

As a result, aircraft operators including existing and start up airlines are motivated to continually reinvent themselves, seeking to increase their overall productivity and cost effectiveness while improving their competitiveness.

This requires their Real Estate Departments and Technical Operations to evaluate their existing situation, while seeking new and imaginative operational, organizational, and facility alternatives.

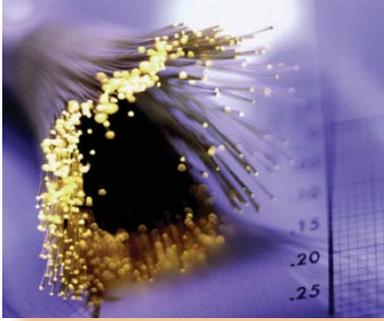
These need to be complemented by a sensitivity to the environment, seeking to reduce energy consumption, while making use of renewable energy sources as a sustainable solution.

To achieve these goals use is made of all encompassing solutions, which address operational and behavioral issues, which build on existing strengths while seeking to create the most cost efficient built environment.



OVERALL PROGRAM DEFINITION





Web based and Broadband Applications



Flexible Maintenance Docks



Mezzanine Interface



Tail Dock

INNOVATION - THE NEXT GENERATION

The evolution of new aircraft together with the present day economic challenges motivates the trend towards Next Generation Solutions in the planning and development of aircraft maintenance facilities.

These address the technical requirements of next generation aircraft such as the A380, A350 and the B787, while seeking to maximize their utilization and reduce their maintenance costs, in addition to creating flexible hangar environments able to accommodate light and heavy maintenance needs.

Traditional concepts used in the planning of aircraft MRO (Maintenance Repair and Overhaul) facilities are therefore being rethought, seeking both increase the productivity of operations and to maximize the utilization of assets.

APPROACH

The approach used in the development of Next Generation aircraft maintenance solutions is focused on:

- **Achieving increased productivity** by means of a systematic approach, which integrates; operational/process requirements, facility needs and organizational/behavioral issues
- **Creating a hangar focused environment** incorporating; multi-level mezzanine, interfaces, boutique in hangar shops, in hangar resources provisioning, and visual management techniques
- **Providing an efficient multi aircraft capability** achieving reduced turn times by means of; flexible multi aircraft maintenance docks, a hangar focused environment, a materials management system
- **Creating a multifunctional environment** including attached hardstand and quick turn ramp positions

This is in addition to addressing those technical issues which are a function of the new systems and applications utilized in the new aircraft.

TECHNICAL NEEDS

The technical maintenance needs of the new aircraft require a changed focus on the types of activities and how they are to be performed. Examples of the changed needs are driven by:

- The use of titanium and carbon reinforced plastics
- Increased numbers of electrical monitoring points - sensors
- Advanced In Flight Entertainment Systems
- Integrated modular avionics capabilities, which can manage up to 40 functions
- The use of electrical in place of hydraulic systems
- QEC (Quick Engine Change) applications for larger Next Generation engines





Natural Ventilation



Materials Logistics



Aircraft Support Campus



Remote Airline Support

This is in addition to the dimensional challenges associated with larger fuselages - sill heights, a taller empennage - vertical stabilizers, higher APU locations, together with the service and/or replacement, requirements of larger moving surfaces.

The creation of an efficient operating environment must therefore address these issues, while meeting both scheduled and unscheduled maintenance requirements.

MULTIFUNCTIONAL SOLUTIONS

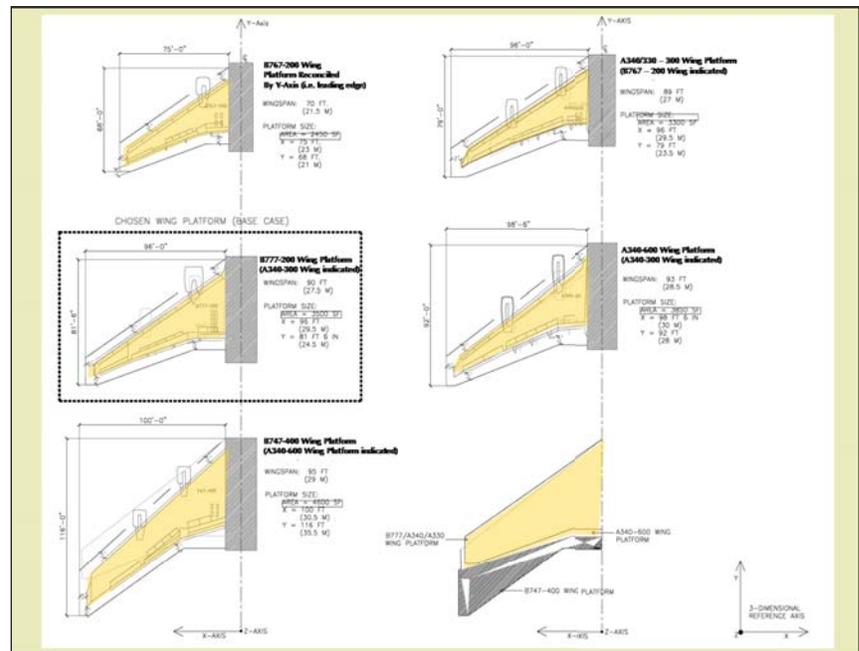
Next Generation Solutions in aircraft maintenance also seek to maximize the amortization of capital invested in a facility. This is driven by the inability to create hangar modules dedicated to a particular aircraft type and maintenance type.

The creation of hangar environments able to efficiently perform multiple types and levels of maintenance is part of the Next Generation Concept and is particularly suited to operators with small numbers of specific aircraft types. This approach follows the trends to "mass customization" utilized in the manufacturing sector.

Traditional concepts are therefore being rethought to remain competitive in a changed environment, where the building and systems provide the ability to meet a diverse and changing operational needs.

This deviates from the creation of hangars dedicated to a particular aircraft type or specific maintenance function.

Aircraft groupings therefore need to be accommodated, providing the levels of flexibility and efficiency required both for heavy or light maintenance tasks.



COMMON WING PLATFORM





On Wing Maintenance



Cockpit Upgrade



Wing Dock & Engine Platform

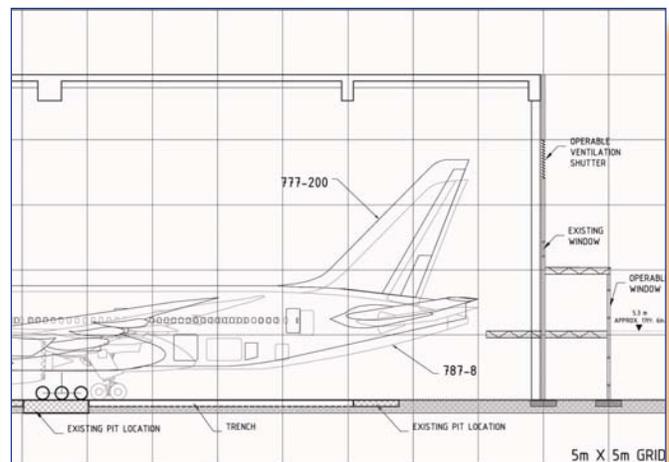
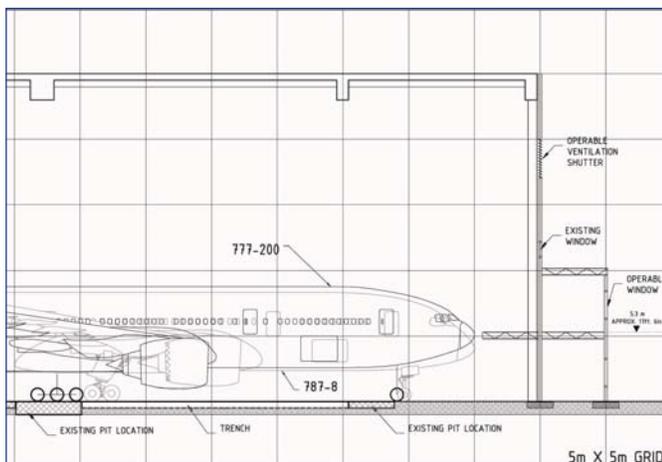
FACILITY CONSIDERATIONS

The development of an MRO facility design suited to a Client's specific needs is a function of:

- **The aircraft types and commonalities**, which exist
- **The maintenance needs** in terms of heavy and/or light-frame, component, engine, interiors
- **Creating a hangar focused environment** in order to facilitate the work of the engineers and mechanics
- **The selection of maintenance docks** either ground supported and/or overhead hung
- **The aircraft support systems and utilities** that are required including in floor systems
- **The alternative structural systems** that are most suited - clear span, cantilever / hybrid structure, vault / fabric option
- **The building systems** including door types, overhead cranes, AFFF, heating/ventilation
- **The aircraft configurations** which incorporate nose in and tail in positions and the provision of dedicated and drop in positions
- **The utilization of green concepts** including natural light, ventilation, the use of grey water systems and renewable energy sources.

These need to be considered while using a facility development methodology which addresses:

- **operational maintenance needs**
- **support shop requirements**
- **materials provisioning - logistics**
- **resource provisioning/staffing**
- **building and site requirements**
- **cost and schedule implications**



NOSE IN AND TAIL IN CONFIGURATIONS





Interiors Upgrade and Modification



Light Maintenance Hangar



Passenger Terminal



Aerospace Manufacturing Plant

REPRESENTATIVE CLIENTS - ASSIGNMENTS

Key staff at Franco Eleuteri and Associates have as a result of their work gained first hand experience with clients in the Americas, Europe, the Middle East, Africa, Japan and Asia.

This involved aircraft maintenance projects for:

- Air Canada, Malaysia Airlines, LAN Chile, AirTransat, Northwest Airlines, Air New Zealand, Kuwait Airlines and Air Methods

In addition to completing assignments for such aerospace clients as:

- Boeing, McDonnell Douglas, General Dynamics, Lockheed, and Kawasaki Heavy Industries

Other aviation related projects include:

- Passenger and air cargo terminals and flight kitchens

Associated areas of expertise include manufacturing, logistics, and transportation, in addition to master developments/industrial cities and special economic zones.

SERVICES

Franco Eleuteri & Associates was established in 2004 as a “boutique” organization with a focus on providing specialist services in the fields of:

- *Management Consulting*
- *Planning*
- *Project Development*
- *Project Implementation*

This involves it in providing services ranging from limited planning or review assignments to more comprehensive consulting and engineering tasks.

As part of its work it typically assists in providing solutions, while bringing value derived from international experience in diverse market - sectors.

This is achieved as an independent entity or by working with partners as part of a project team.

The goal is to assist clients to develop and implement internationally competitive solutions which are financially viable, while providing a means for job creation and economic development.

This enables them to meet the challenges of the New World Economy while creating a sustainable environment.

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