

CHAPTER 4

BACKGROUND ANALYSIS

4.1. GLOBAL ECONOMY AND AIR TRAFFIC TREND

From the Boeing Market Outlook (2003), the world GDP is forecasted to grow by 3.2% over the next 20 years. In mature economies, GDP growth will average between 2% and just over 3% per year. By contrast, GDP growth in developing regions may average over 4%.

Mature economies rely on productivity gains, service industries, and consumer markets for much of their gains, whereas emerging economies are characterised by expanding labour forces, increased manufacturing, and entry into global capital and trade markets

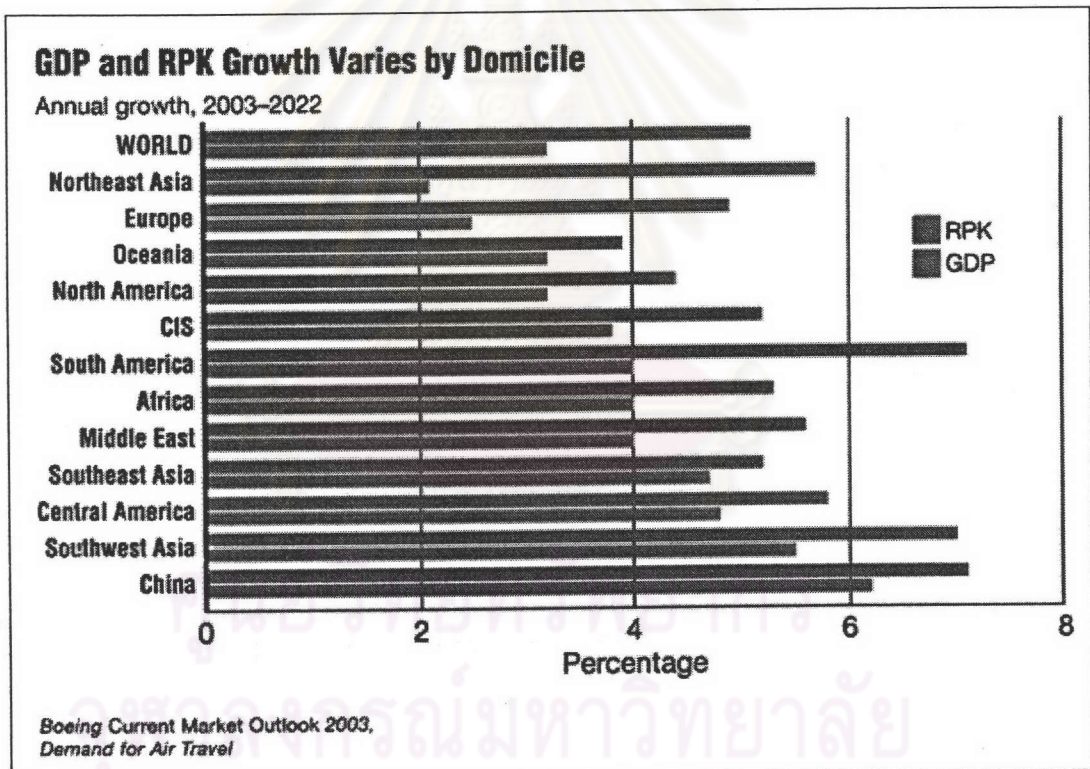


Figure 4.1: GDP and RPK growth varies by domicile

Source: Boeing Market Outlook (2003)

Note: RPK = Revenue Passenger Kilometres

GDP = Growth Domestic Product

Boeing (2003) predicts the world air traffic will continue to grow. World air traffic measured in RPKs will grow 5.1% annually over the next 20 years, approximately two percentage points more than GDP.

Northeast Asia, South America, and Europe have the largest growth of air traffic in excess of GDP. Europe will experience the continuing positive effects of liberalisation. South America will recover from present economic slowdowns and will increase air traffic through liberalisation, international trade, and tourist development. Japan and Korea currently generate less air travel than their wealth would indicate and in the long term should show more robust air travel rates.

Southwest Asia and Africa GDP and traffic have historically lagged the world. Both regions are forecast to grow above the world average over the next 20 years, as their economies and airline industries further develop.

4.2. AIRLINE INDUSTRY TREND

The trends for the airlines to be developed toward the following phenomena could be observed.

Deregulation: most of the countries in the world are discussing, if not already declared, a less degree of regulatory enforcement in the airlines industries. This would result in a more competitive environment. There will be a numbers of new airlines make their debut, while others unable to stay in business due to incompetence.

Liberalisation: the increasing numbers of bilateral or multilateral agreement and batter services or trades among countries should be observed.

Privatisation: most of state own airlines and associated MRO would be privatised. The airlines maintenance and engineering department would be spun off or restructured as SBU (strategic business unit) for a more effective and more dynamics management.

Alliance: the airlines will adopt the concept to establish strategic alliances with others in order to expand their networks and obtain economies of scale. The establishment could be in form of code sharing, service reciprocating and maintenance and engineering resource sharing. Not only the airlines are seeking alliances, but also the OEM and the MRO due to the same reason. New mergers and acquisition will take place among airlines, MRO and OEM. Some of them have already taken place, for example, General Electric and Honeywell, Pratt & Whitney and Japan Airlines.

However, from the terrorist attacks in many developed countries and Bird-Flu Virus in SE-Asia might cause the flying-scare. The following uncertainties could be predicated:

- Approximately 15-20% global average flights reduction.
- Approximately 250 aircraft have been put on ground in the US and in Europe.
- Certain amount of decreasing air travel due to fear of terrorism and downturn of global economy.
- Approximately 200% increase in insurance premium.
- Unpredictable increase in fuel price.

4.3. AIRCRAFT-MRO MARKET OUTLOOKS

Three competitive forces in maintenance repair and service market are investigated:

Barriers to entry:

- Large volume of production is required in order to obtain the economies of scale and sufficient revenues to cover operating expenses.
- High initial investment costs.
- Limited numbers of skilled labour are available in the industry.
- Lack of specialists in the new generation aircraft computerised system complements and avionics.
- High investment costs for repair and test equipment of new generation aircraft computerised system components and avionics.

Customers:

- Airlines fleet downsizing and workforce reduction.
- Tougher competition among airlines.
- Tight costs control and limited investment.
- Increasing safety and security measures.
- Seeking strategic alliances.

Suppliers:

- Increasing numbers of joint ventures, acquisitions and mergers. Most of the major airlines, MRO and OEM will acquire and merge with the regional and local MRO.
- The only firms with strong and effective management would be able to stay in business.
- By the year, 2010, there would be only less than ten MROs as the global MRO service providers. The rest would be small, lean and specialised service providers, mostly providing specialised services.

The world fleet is expected to more than double by 2022, with total fleet size growing to 33,999 aircraft. Over the 20-year forecast period, 5,889 aircraft will be retired from active commercial service and will be replaced. An additional 18,387 aircraft will be needed to fill capacity demand (Boeing, 2003).

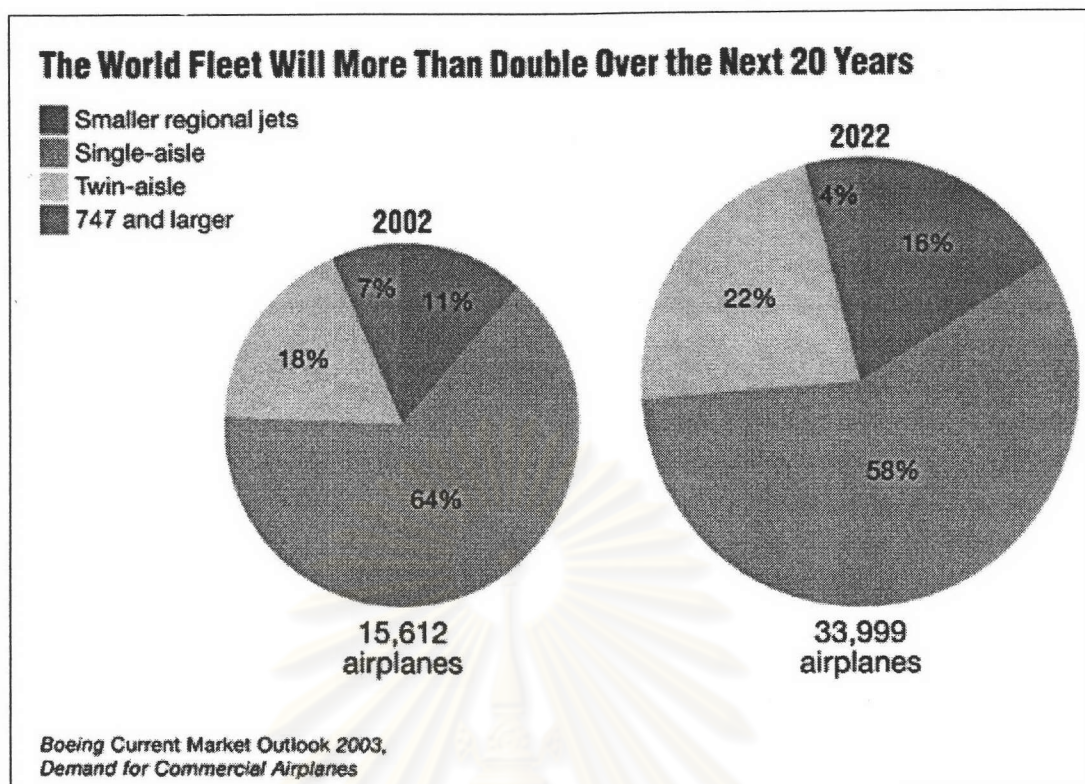


Figure 4.2: The world fleet in the next 20 years.

Source: Boeing Market Outlook (2003)

Short-haul markets dominate departures. Worldwide, more than 4,300 small and intermediate regional jets will be delivered by 2022. Short-haul markets dominate the world's departures, representing over 90% of the total. Domestic flying in Europe and North America alone will constitute almost 43% of the world's added ASKs and will absorb a majority of the deliveries of single-aisle aircraft.

Asia-Pacific requires major share of large capacity. Over 80% of the world's added ASKs on large aircraft will serve travel within, to, and from the Asia-Pacific region. Because of long routes and the high number of seats on these aircraft, relatively few large aircraft are needed to provide the ASKs that market characteristics require.

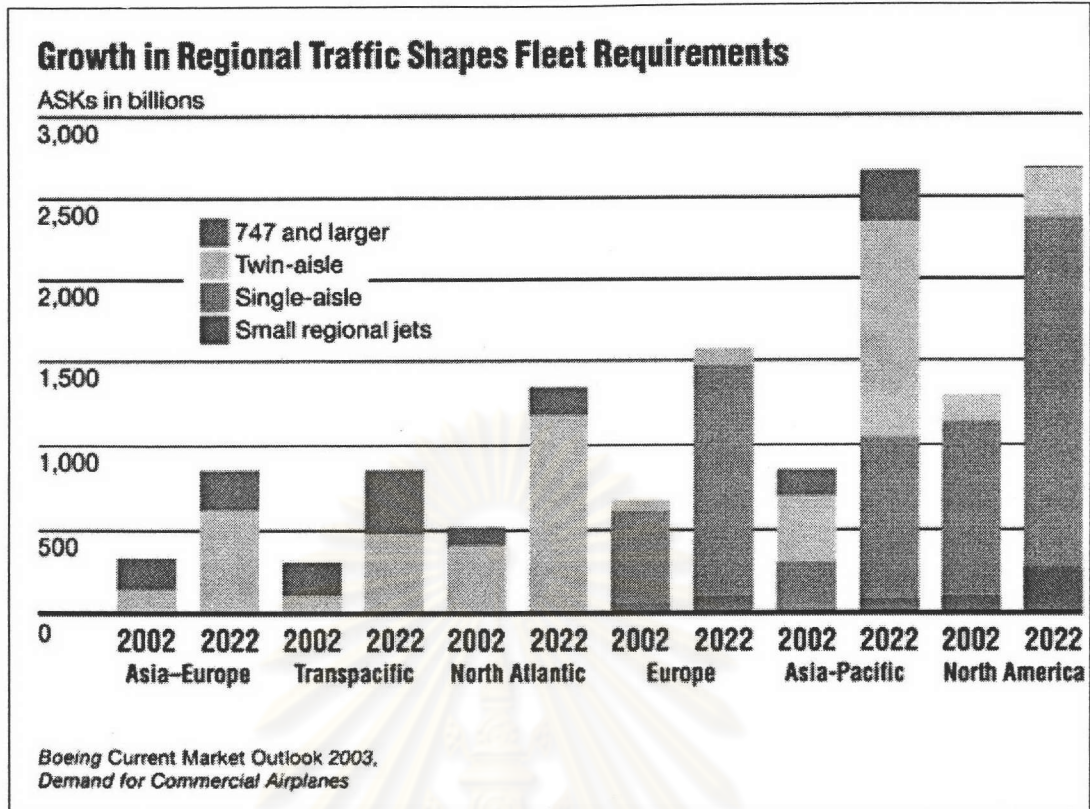


Figure 4.3: Growth in regional traffic shapes fleet requirements

Source: Boeing Market Outlook (2003)

Airlines population growth is one of the factors affecting MRO market growth. The MRO market growth rate is normally in direct proportion with the aircraft population.

Table 4.1: MRO market in Year 2003 and 2023

Services	Year 2003 (Billion US Dollar)	Year 2023 (Billion US Dollar)
Line and light maintenance	13.80	32.00
Heavy maintenance	18.50	43.00
Engine shop visit	8.40	20.00
A/C component	12.30	29.00
Major modification / Interior	1.80	3.50
A/C and engine parts supply	8.10	19.00
Total	62.90	146.50

Source: Boeing Market Outlook (2003)

Table 4.2: World MRO Market and Outsourcing Trends

Services	Total (Billion US Dollar)	Outsourcing (Billion US Dollar)
Line	6.4	0.6
Heavy maintenance	5.1	1.2
Engine	7.9	3.6
Component	7.0	4.1
Modification	4.5	2.0
Total	30.90	11.50

Source: MRO Today (1999)

4.4. MAJOR COMPETITORS IN MRO-MARKET

The top 10 MRO service providers can be ranked as follows (MRO Today, 1999):

Global Ranks:

1. TIMCO
2. Lufthansa Technik
3. HAECO
4. Goodrich MRO
5. SIA Engineering (subsidiary of Singapore Airlines)
6. KLM Engineering (subsidiary of KLM Airlines)
7. Alitalia Tech.
8. Bedek
9. SR Technique
10. FLS Aerospace

Asia Pacific:

1. HAECO
2. SIA Engineering
3. Air New Zealand Engineering
4. AMECO Beijing
5. Aviation
6. Qantas
7. GAMECO
8. Japan Airlines
9. Orean Airlines
10. TAECO

4.5. PORTFOLIO ANALYSIS

The case organisation provides a wide range of MRO services, these services can be analysed to identify which service activities offer high potential and which one are the drains on the resources. The BCG Matrix is used which there are four strategic business areas:

<p>STAR</p> <ul style="list-style-type: none"> • CF6-50 / CF6-80 Engines • Tools & Equipments Calibration 	<p>QUESTION MARK</p> <ul style="list-style-type: none"> • Freighter Conversion • Land and Marine Engine Overhauls
<p>CASH COW</p> <ul style="list-style-type: none"> • Major Modification • Line Maintenance e.g. technical handling, AOG assistant, A-Check • Hangar and Tools and Equipment Leasing 	<p>DOG</p> <ul style="list-style-type: none"> • Government Aircraft Support and other General Aviation

4.6. SWOT ANALYSIS

Internal analysis is performed in order to identify the strengths, weaknesses in all areas of the operations. External analysis is performed in order to identify and evaluate opportunities and threats interfacing with the case organisation.

Major areas to be concerned, they are:

- Global and regional economy
- Social, cultural and demographic trends
- Political, governmental and legal conditions
- Technological innovation
- Environmental impact
- Competition

4.6.1. Strengths

Case organisation has been established as one of the strategic business unit (SBU) of its main airline, the infrastructures of case organisation are still tied up to main airline which give the advantage over the MRO establishment. The main strength of Case organisation is "Technical Know-How and Solid Experience". The strengths on each MRO are listed below:

Aircraft Line Maintenance: Case organisation has more than 40 years experience in servicing line maintenance to the main airline's own fleets and 60 customers. There are approximately 200 departures per day at Bangkok International Airport, which can generate approximately 300 million THB each year from external customers. → 4

Aircraft Heavy Maintenance: Case organisation has established the heavy maintenance centre since 1985. The centre is designed to serve the heavy maintenance for main airline's own fleet as well as the external customers with a wide range of aircraft types, such as A300, A330, B777, B737, B747, ATR42, ATR 72, MD-11, DC-10. In 2000, the second centre at Utapao has been established to serve the increasing demand. This second centre is capable to serve heavy maintenance for all type of wide body aircraft, including C-Check, D-Check. Both centres are certified and rewarded by many authorities, such as, FAA, JAA, DOA, JCAB. → 4

Engine Overhauls: As mentioned in BCG Matrix that Case organisation has an expertise in serving CF6-50, -80 under cooperation between KLM, KSSU and Thai Airways. Case organisation has gained experience in CF6 overhaul for its main airline and external customers' engines. The shop is available to expand for engine overhaul market.

Components Overhaul: Since the establishment, Case organisation has invested extensively on the overhaul facilities of the aircraft components, especially for A300 and B747. The component overhauls on both types of aircraft should be considered as one of the strength of the Department.

Tools and Equipments Calibration: Case organisation has established a laboratory to calibrate the tools and equipments as required by the airworthiness regulations. The tools and equipments calibration are a major requirements of the commercial factories according to ISO 9000 (Quality Management Standard). Technical Dement has sufficient capability to perform these calibrations for most tools and equipments used in factories.

4.6.2. Weaknesses

As the case organisation has been the SBU (strategic business unit) of its main airline, the weaknesses have been involved with the complex organisational structure, changing government's policies, lack of both management and financial flexibility. These kinds of weaknesses are usually seen in the state enterprises.

Aircraft Line Maintenance: The Line Maintenance Division has been established for 43 years. The organisational structure has been revamped from time to time, the method of manpower allocation and productivity is poor. Management has not been developed relevant to number of increasing personnel. Customer relationship management is one of the main weaknesses that Case organisation should improve.

Aircraft Heavy Maintenance: The weaknesses of Aircraft Heavy Maintenance Division are similar to those of Line Maintenance Division. Apart from similar weaknesses, Heavy Maintenance Division does not offer a wide range of services, which heavy maintenance service are limited to the aircraft type operated by its main airline only while the two centres are available for market expansion. The assets are not fully utilised.

Engine Overhauls: The weakness in Engine Overhaul are lead-time for spare parts procurement, turn around time for each engine shop visit. Moreover the engine exchange scheme, which could be offered to the customers, is limited by the government regulation regarding property and inventory control.

Components Overhauls: The Case organisation has a limited capability for the repair of the new generation aircraft, e.g. B777, A330. The investment for those components repair and test equipment is high.

Organisation and Management: Apart from weaknesses in the areas of MRO services, there are some generic weaknesses in the organisation, which requires systematic development.

- Bureaucratic and cumbersome management
- Silos of organisational structure
- Insufficient human resource management
- Lack of strategic planning
- Poor management information system
- Increasing personnel cost

These generic weaknesses require an extensive and systematic development, which must be implemented by Case organisation, e.g. re-structuring of the management organisation, development of HR department.

4.6.3. Opportunities

Opportunities Common to all service Activities: Generic opportunities for Case organisation are:

- Trend towards outsourcing most of the works, especially mechanical and sheet metal works by most of the airlines regardless the size of their fleets.
- Numbers of private airlines, which have been established in the recent years.
- Barriers to entry into the MRO business due to high investment
- Exchange Rate makes the service price become attractive

Engine Overhauls: there are plenty of surplus resources, i.e. tools and equipment, spare parts, workshop, capacity and trained personnel available for market expansion.

Tools and Equipment Calibration: Strong demand from commercial customers due to ISO 9000 requirement relevant to control of inspection and test equipment used in the factories. The ISO standard specified that inspection and test tools and equipment will be periodically calibrated according to the industrial requirements.

4.6.4. Threats

Threats common to all services activities: The generic threat for MRO services are listed below:

- Aging aircraft and engine will be brought out of service sooner. Therefore, requirement for maintenance and repair will be reduced.
- Trend for the OEM to establish the MRO firms on their own or on joint-venture basis with the airlines especially the regional competitors.
- High Investment cost for new generation aircraft maintenance component repair and test equipment.
- Some competitors can provide one-stop shopping which they are capable to perform airframe D-Check, landing gear overhaul, and engine overhaul per one heavy maintenance visit.

Aircraft Line Maintenance: In the near future, Local Airport Authority will establish the ground handling company, which include the line maintenance activities at the new Bangkok International Airport (Suvarnabhumi). The Line Maintenance is a major revenue for the Case organisation which accounted for 65% of the total revenues.