

**THE FUTURE OF THE AVIATION INDUSTRY  
IN THE PACIFIC RIM**

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**ABSTRACT**

The Pacific Rim is on the threshold of an extended period of extraordinary economic growth. As a result, the aerospace industry will also experience growth demands unprecedented in history. International, regional, and freight traffic are dramatically increasing. New airports are being built while old ones are expanded and renovated. This has led to a sharp growth in the aerospace manufacturing industry and an increase in the technical training being conducted to support it. Extensive opportunities exist today and in the future to assist in the expansion.

## INTRODUCTION

This paper will broadly review the type of aerospace industry growth forecast for the Pacific Rim over the next 20 years. It will address regional issues concerning economic growth, the air carrier industry, airport and airspace utilization, aircraft manufacturing industry, and ab initio flight training. It is the intent of this paper to give the reader a point of departure from which individual study may be conducted within a specific area of interest.

## EXPANSION

### Regional Economic Growth

The Orient has always woven a spell to enchant the West. Vast, teeming, enigmatic Asia's inexhaustible riches have fired the imagination of Westerners even before Marco Polo. Since the beginning of time, there has been a slow but steady economic movement Westward. John Hay, Secretary of State under President Theodore Roosevelt, said, "Western history began with a Mediterranean era, passed through an Atlantic era, and is now moving into a Pacific era." Stephen M. Wolf, chairman and president of United Airlines, agrees.

United, which has offered service to various Pacific Rim destinations since 1986, has become one of the U.S. leaders in this continued Westward expansion. In an article in Aviation Equipment Maintenance magazine Wolf referred to the 1980's as, "The emergence of the Pacific Century" (Worthington, 1989). We are now living in that Pacific era, a time when fiscal and human resources will be directed to an area of the world more commonly known as the Pacific Rim.

The term Pacific Rim identifies a ring of active volcanoes around the edge of the Pacific. (Aikman, 1986). For the purposes of this paper, the term Pacific Rim refers specifically to the relationship between the United States and the following countries: Hong Kong (actually a colony of Great Britain until 1997, when it reverts fully to China), Japan, Korea, China, Taiwan, Vietnam, the Philippines, Thailand, Malaysia, Singapore, and Indonesia.

The Pacific Rim is the center of world economic and political interest. Last year, the Defense Science Board called for sweeping changes in the Pentagon's policies and organizational structure. According to Hughes Aircraft Company chairman Malcom Currie, who headed the task force, "It was the Board's conclusion that national security can no longer be viewed only in military terms, but must include economic well-being as a

key component" (Morrocco, 1989). While sixty percent of the world's population is in Asia (20% in China alone), it only enjoys 21% of the economic share (McDonnell, 1989). But the days of economic dominance by the West are numbered. According to research conducted by McDonnell Douglas, the Pacific Rim should economically outperform the rest of the world and, in the long run, be the fastest growing region (Fink, 1989-a).

The same study projected the Pacific Rim would have the world's highest air transportation growth rates during the period 1988 - 2010. Currently the Federal Aviation Administration (FAA) estimates transpacific flights are increasing at a rate of 4,000 a year in the North America - Pacific Rim corridor (Proctor, 1990-c). About 40% of the world's traffic, estimated to reach 2 billion passengers a year by the year 2000, will be to and from Pacific Rim countries according to Gunter O. Eser, director general of the International Air Transport Association. Recently, twelve U.S. carriers have applied to open new routes to Japan, twice the number that can be authorized by the Department of Transportation (Proctor, 1989-c).

The freight industry is equally affected as witnessed by the 1988 move of Federal Express into the region. As fax machines edge the company out of the overnight letter business, Federal Express is rapidly moving into express parcels (Pocock, 1990). The company has purchased a major interest in Daisei, a medium-sized Japanese trucking company. Even more significant, it has purchase Tiger International, a major air cargo firm that also has considerable ties to Japanese shipping (Pocock, 1990). At the same time, three other carriers are competing for a single cargo route about to be authorized between the U.S. and the Pacific Rim (Fotos, 1990).

The demand is not speculative; people and goods are already moving at ever increasing frequency. According to Michael Hewitt, past secretary general for the Orient Airlines Association (OAA), "By the year 2000, Japan will have about 25 million citizens with the discretionary income to travel internationally. Improving economies throughout the region could add an additional 100 million travelers in the same time frame" (Proctor, 1989-c). The competition for world attention is strong among Pacific Rim countries to improve those economies. Tourism is up everywhere, even in Vietnam where the welcome mat, if not very modern, is definitely sincerely displayed. All the nations are courting the business world but none more so than Singapore.

According to Singapore's Prime Minister Lee Kuan Yew, the business of Singapore is business (Haynes, 1989). Lee, who has ruled the tiny republic since its birth in 1965, boasts "Singapore offers a strike-free work force, deliveries that arrive on time, lunch breaks that don't extend far into the

afternoon, and a general air of cooperation" (Haynes, 1989). Singapore, once known as Europe's gateway to the east, has become Asia's gateway to the west.

### Aerospace Industry

One of the most telling indicators of the growing economic strength of the region is the increased emphasis on local manufacturing. While clothing manufacturing is very common, there is a strong move by most countries to get into the aerospace industry. Certainly, one of the most impressive attempts is by Indonesia's monopoly, the government-owned aircraft factory IPTN (Fink, 1990-b).

It is not by chance that Indonesia has focused on aerospace since its independence in 1945. The vast and diverse transportation needs of the Pacific Rim are best illustrated by Indonesia whose national motto is "Bhinneka Tunggal Ika," "Unity in Diversity." This 3,200-mile-long cluster of islands houses the world's fifth largest population. Indonesia's more than 160 million people are made up of more than 250 ethnic groups including the largest Moslem population on Earth. There is a 20% poverty rate, large-scale unemployment, and wide-spread illiteracy, particularly in urban areas. It is a country composed of 13,677 islands that approximately stretch from Australia to Vietnam (Cohan, 1987) (Fink, 1990-c).

Indonesian state minister for research and technology, Bacharuddin Jusuf Habibie strongly believes aircraft can help integrate the country's economy, culture, and society (Cohan, 1989). For these, and other reasons, since 1974, Indonesia's industrialization policy has used the aircraft industry as its cornerstone and Industri Pesawat Terbang Nusantara (IPTN) is that cornerstone. For over 10 years, they have been manufacturing the CN-212, a utility twin-turboprop transport, and more recently a 44-seat turboprop airliner the CN-235. Both aircraft are produced in cooperation with Spain's national aircraft manufacturer, CASA. IPTN has similar agreements with factories in the US, France, and Germany, and is working toward becoming a subcontractor to Boeing (Cohan, 1987).

Other countries are also moving along similar lines. Japan, the strongest economic power in the Pacific Rim, is strengthening its aerospace relationship with the U.S. as the Ishida Group plans to build a new tilt-wing transport aircraft in the United States (Brown, 1990). China's most serious challenge is to complete the modernization of its domestic air transportation network particularly with respect toward infusing China's fledgling aviation industry with state-of-the-art technology (Fink, 1989-a). As China moves toward modernizing its industrial base with Western help it is making a fundamental shift from

building military aircraft to export-oriented commercial aircraft production (Fink, 1989-b). The Shanghai Aircraft Industrial Corporation is a case in point.

Two of SAIC's factories were completely renovated to meet the United States Federal Aviation Administration's production facility certification requirements for the MD-82 program (China is assembling the MD-82 transport in Shanghai in partnership with McDonnell Douglas Corp). A new paint hangar and headquarters building also were built. The company now has one of the most modern facilities in China (Fink, 1989-a).

### Airline Industry

The airlines of Pacific Rim countries are responding in kind. Only 30 years old, Indonesia's flag airline Garuda is the largest in the Southern Hemisphere with over 700 pilots. It has just begun weekly service to Los Angeles, has 10 flights a week to Tokyo, and has signed several agreements with other international carriers establishing joint operations to various Asian and European cities. Annual passenger traffic growth is in the double-digits (Cohan, 1987). Delta and Singapore Airlines "...have signed an equity exchange and marketing agreement that broadens the reach of both airlines..." The marketing agreement covers 10 years and includes cooperation in a number of areas. Both American and United are dramatically increasing their presence in the region and other U.S. air carriers are adding Pacific Rim destinations to their list. (Delta, 1989). Singapore Airlines has just placed a massive repeat order for Boeing 747-400s and could have up to 50 of the type in service by century's end. If projected growth rates prove to be correct, the airline will be bigger than Lufthansa is today, in RPK (revenue passenger kilometers) terms, by the year 2000 (Rek, 1990).

Regional figures are as impressive as international. Commuter manufacturers forecast a need for between 480 and 735 smaller transports in the region through 2005, not including the People's Republic of China. Martin Craigs, vice president of marketing in the Asia-Pacific region for Saab Aircraft International, feels "Per-capita income seems to be an indicator of commuter aircraft sales potential. In countries with high average personal wages, commuter operators can charge high enough fares to justify the purchase of more aircraft" (Proctor, 1989-c). Countries with relatively low per capita income are not necessarily excluded from a regional carrier because of high start up costs. One innovation was an attempt at a joint venture between StatesWest Airlines, a Phoenix-based independent commuter-regional airline, and an Asia-based company (O'Lone, 1990-a). While negotiations ultimately broke down, future efforts of this type are anticipated.

### Airport and Airspace Capacity

If there is any down-side to the dramatic growth of the Pacific Rim it is airspace and airport capacity. A narrow airspace "gate" over Tokyo restricts flights in and out, and also routes between North America and Korea, Hong Kong, Taiwan and the Philippines. Virtually all points in Southeast Asia are accessed through those cities. The primary reason for this is a large amount of defense-related, restricted airspace surrounding the gate. Everyone agrees there will have to be changes but their exact nature is controversial. Asia, after all, is still Asia (Proctor, 1990-c). In at least one place, enmity is the major problem as controllers from the People's Republic of China refuse to hand off aircraft to controllers from Vietnam. The result is aircraft flying Hong Kong to Bangkok must fly further south, which disrupts traffic between the Philippines, Indonesia and Malaysia to Japan, Taiwan and Korea. Everyone agrees there must be short-term airspace management modifications including better inter-agency coordination and the creation of additional flight routes (Proctor, 1990-c). There is also currently a study underway to lower aircraft separation requirements. Long-term alternatives include creating an automatic satellite communication network between controllers and aircraft. This, combined with high-accuracy, satellite-based global positioning systems on aircraft, would increase airway capacity by reducing separation requirements (Proctor, 1990-c).

Most Pacific Rim airports are already suffering from congestion and delays. For example, corporate flights to Hong Kong are often required to schedule arrivals during off hours with quick off-loading times. They are then required to fly to another country (often Taiwan) to park (International Operations, 1990). "With strong traffic virtually guaranteed for the next 10 years, airlines should now concentrate on removing or reducing critical chokepoints" according to Gunter O. Eser, director general of the International Air Transport Association. "Congestion is the single biggest barrier to growth" in the Asia-Pacific market, he said (Proctor, 1990-c). Ibrahim Taib, new secretary general of the OAA agrees. He stated, "One of the largest challenges OAA airlines face in the 1990's [...is handling growth]". Charles McKee, an analyst for Hong Kong-based Avmark Asia, Ltd. says its an accumulation of a lack of passenger facilities, insufficient and inadequate runways, and an ineffective air traffic control system (Proctor, 1990-c).

On the other hand, there is a tremendous amount of new construction. Major new airports are planned for Hong Kong, Macao, and Osaka. The Japanese transportation ministry is also proceeding with plans to build 11 more regional airports during the next five years with nine more under discussion. At the same time, there are substantial renovations and upgrades planned for

Narita's new Tokyo International, Changi (Singapore), Soekarno-Hatta (Jakarta) and Don Muang (Bangkok). Singapore, for instance, will increase Changi's currently nominal capacity to 30 million passengers per year (Rek, 1990) (Proctor, 1990-c).

### Current Training Situation

There is an increasing amount of training being conducted within the region rather than out of the country as in the past. Never-the-less it is difficult for most countries to fully develop their training programs, recruit good instructors, and complete enough students to satisfy the demand. An attempt has been made to meet Indonesia's requirement for pilots through its Civil Aviation Training Center near Jakarta. Opened in 1984, all of its graduates go to Indonesian airlines or the oil industry. They can't keep up with the demand (Cohan, 1987).

China has two flying colleges (Guanghan and Mianyang) but they are woefully behind in their training techniques and methodology. The ab initio schools have just recently replaced the Soviet Y-5 biplane with 12 Aerospatiale/Socata TB-20 Trinidad trainers. For the first time, they are able to train their future air carrier pilots in primary aircraft with retractable, tricycle gear (Proctor, 1989-b).

The problem is not limited to pilots alone; it's all technical skills. Michael Miles, chairman of Cathay Pacific Airways, said, "Little has been said and less done about the inefficient and poorly trained air traffic control staff in the region, or the inadequate equipment on which they rely, or about the frequent and potentially dangerous disregard of civilian air traffic control by the air forces of some countries in the region" (Jansen, 1988). There is clearly the need for more training and more expertise to help develop the necessary programs.

### SUMMARY

It is obvious that the future of the Pacific Rim is one of steadily increasing economic strength. As the various countries emerge economically, they will attract more people and goods from all over the world, thereby increasing the demand for international and regional air transportation. More and more pilots, mechanics, ATC, and other technical personnel will need to be trained. The demand for technical people, particularly training specialists, will be great. It is important for individuals and corporations to take the time now to prepare for the future by learning to understand and respect the customs and cultures of different countries.

## REFERENCES

- Aikman, David. (1986). Pacific Rim - Area of Change, Area of Opportunity. Boston: Little Brown and Company.
- Brown, David A. (1990, January 1). Japan's Ishida Group May Build Tilt-Wing Transport in U.S. Aviation Week & Space Technology, pp. 83, 85, 87.
- Cohan, Phil. (1987, February/March). On the Wings of the Garuda. Air & Space, pp. 31-33, 35-36, 39-40.
- Competition in Aviation/Aeronautics. (1990, Spring). Aviation Space Education, pg. 12.
- Delta, Singapore Airlines Sign Marketing Agreement. (1989, November 6). Aviation Week & Space Technology, pg. 21.
- Fink, Donald E. and Paul Proctor. (1989-a, December 11). Political Stability Vital to Long-Term Business Plans. Aviation Week & Space Technology, pp. 52-53.
- Fink, Donald E. and Paul Proctor. (1989-b, December 11). China Seeks Aid From West in Shift from Military to Commercial Manufacture. Aviation Week & Space Technology, pg 53.
- Fink, Donald E. and Paul Proctor. (1990-a, April 16). American is Seeking to Buy 747-400s To Service Pacific Rim Destinations. Aviation Week & Space Technology, pg. 16.
- Fink, Donald E. and Paul Proctor. (1990-b, April 16). Indonesia Expands Research Center to Support Growth of Domestic Industry. Aviation Week & Space Technology, pg. 46.
- Fink, Donald E. and Paul Proctor. (1990-c, April 16). Industrialization Policy Focuses on Aircraft Sector. Aviation Week & Space Technology, pp. 36-37, 39.
- Fink, Donald E. and Paul Proctor. (1990-d, April 16). Garuda to Increase International Service With \$3.6-Billion Order. Aviation Week & Space Technology, pp. 47-48, 52.
- Fotos, Christopher P. (1990, January 29). Filings from Airlines Show Stiff Competition for Japanese Routes. Aviation Week & Space Technology, pg. 67.
- Haynes, Tricia. (1989, November). Solid Singapore. Business Traveler International, pp. 33-35.
- International Operations. (1990, May) Business and Commercial Aviation, pp. 45-47.
- Island for New International Airport Rises in Osaka Bay. (1989, May 8). Aviation Week & Space Technology, pg. 71.
- Jansen, Doug. (1988, April). Pacific Rim Carriers Face Governmental Constraints. Airline Executive, pg. 19.
- Japanese Plan Wind Tunnel Tests of Tilt-Wing Transport Model. (1989, June 19). Aviation Week & Space Technology, pg. 70.
- Karniol, Robert. (1989, December). Cathay Pacific Takes a Gamble on Its Future. Interavia, pp. 1167-1169.
- Karniol, Robert. (1989, January). Expanding Horizons for Malaysia's Airod. Interavia, pp. 75-76.
- Lipman, Geoffrey H. (1988, September). European Mergers Inevitable. Airline Executive, pp. 36-38.

- McDonnell Douglas Gazes Into Its Crystal Ball. (1990, January). IATA Review, pg. 3-7.
- Middleton, Drew. (1968). America's Stake in Asia. Philadelphia: J.B. Lippincott Company.
- Morocco, John D. (1989, November 13). Task Force Urges Overhaul of Pentagon Policy On Industrial Cooperation with Pacific Rim. Aviation Week & Space Technology, pg. 32.
- O'Lone, Richard G. (1990-a, February 12). U.S. Carriers Jockey for Position in Booming Asia/Pacific Region. Aviation Week & Space Technology, pp. 55, 57, 59.
- O'Lone, Richard G. and Eiichiro Sekigawa. (1990-b, April 23). Japan Will Have 8-10-% Share of 767-X Program. Aviation Week & Space Technology, pp. 18-19.
- Ott, James. (1990, February 12). U.S. Carriers Jockey for Position In Booming Asia/Pacific Region. Aviation Week & Space Technology, pg. 55-59.
- Pocock, Chris. (1990, February). Air Freight is Big Business in the Orient. Interavia, pp. 112-114.
- Proctor, Paul. (1989-a, August 7). International Airport to be Built on Macao. Aviation Week & Space Technology, pg. 77.
- Proctor, Paul. (1989-b, August 21). China Uses Trinidad TB-20s to Replace Y-5 Biplanes in Pilot Training. Aviation Week & Space Technology, pg. 97.
- Proctor, Paul. (1990-a, February 12). Booming Asian Economies Expected to Spur Continued Increases in Airline Traffic. Aviation Week & Space Technology, pg. 45.
- Proctor, Paul. (1990-b, February 12). Hong Kong Travel Agents Seek Integrated CRS System With Multi-Airline Access. Aviation Week & Space Technology, pg. 50.
- Proctor, Paul. (1990-c, February 12). System Capacity May Limit Pacific Rim Traffic Growth. Aviation Week & Space Technology, pg. 42-5.
- Proctor, Paul. (1990-d, June 11). Cathay Seeks To Increase Capacity on Current Routes. Aviation Week & Space Technology, pg. 32-4.
- Proctor, Paul. (1990-e, June 11). Dragonair Doubles Traffic, Staff After Being Sold. Aviation Week & Space Technology, pg. 34-5.
- Shiffrin, Carole A. (1990, February 12). European Airframe Manufacturers Pursue Growing Asia/Pacific Market. Aviation Week & Space Technology, pg. 62-69.