manufacturers to spend more money in research and development and less to defend product liability cases in the courts.

While these changes were anticipated at the 1995 TRB Forecast Workshop, the benefits are now becoming reality, and the industry initiatives over the past two years have evolved from sketchy plans to market place reality.

## Piston-Powered Aircraft Fleet

The piston-powered aircraft fleet is divided into two segments, single-engine and multi-engine aircraft. Fleet age has increased; the average piston aircraft is now 27 years old. With the aircraft population at 129,000 for single-engine and 16,000 for twin-engine, new production will not be sufficient to reduce the average age. However, fleet size should grow—after declining by about 3 percent for the period 1990-1996. Even with the attrition of older aircraft and loss of some aircraft to accidents, the fleet will begin to grow in 1997.

The single engine fleet will grow from 128,848 in 1996 to 129,080 in 1997, 0.4 percent in 1997. The 1998 fleet will grow by 1.2 percent to 130,915 and for 1999 it will grow to 132,486, 1.2 percent increase. For the period 1996 to 2002 the fleet will grow at an annual rate of 0.9 percent to 135,964 in 2002. This growth rate seems relatively modest until one considers the 2.9 percent per year *reduction* that has taken place in the fleet since 1990.

The multi-engine fleet has contracted by an average of 4.6 percent per year since 1990, and aircraft production growth has been limited primarily to singleengine aircraft. This reduction is expected to stop in 1997, with no change in fleet size from 1996. Growth thereafter should increase by 0.3 percent in 1998, and 0.4 percent in 1999. The fleet will stay at 15,937 in 1997 and grow to 15,983 in 1998 and to 16, 050 in 1999. By 2002 the fleet is forecast to increase to 16,314.

# Flight Hours

Piston-powered aircraft hours flown have declined by 4.9 percent for single-engine, and 6.8 percent for multiengine aircraft from 1990 through 1996. With the improvement in the general aviation environment, caused primarily by tort reform and the improved economy, the flight hours should increase.

Single-engine flight hours were estimated at 16,169 thousand in 1996, and are expected to grow by 0.5 percent in 1997 to 16,250 thousand. 1998 will bring a 1.4 percent growth to 16,484 thousand and by 1999 flight hours will grow by 1.5 percent to 16,728 thousand. For the period 1996-2002 the flight hours for single engine piston aircraft will grow by 1.5 percent per annum to 17,680 thousand.

Multi-engine piston-powered aircraft flew an estimated 2,595 thousand hours in 1996 and this reflects a 6.8 percent annual decline since 1990. In 1997 the figures are expected to show an improvement of 0.2 percent to 2,600 thousand hours and in 1998 to 2,610 thousand for 0.4 percent increase. 1999 estimates are 2,623 thousand hours—a 0.5 percent increase—and the period 1997-2002 will show a 0.5 percent growth rate to 2,681 thousand hours in 2002.

A concern of the panel was that FAA data have shown large fluctuations in flight hours—both up and down—in past years, indicating a possible problem that needs to be explained, validated and/or corrected to ensure that this is an accurate indicator of industry health.

### Summary

The panel was optimistic about growth of the light and personal aircraft market—one direct result of the improved climate provided by the General Aviation Revitalization Act of 1994 and the continuous improvement in the economy. If the economy stumbles or the regulatory environment becomes less friendly, this activity could return to its previous downward trends. Therefore, the industry initiatives to spur flight training activities and industry lobbying efforts to prevent over regulation will be critical to continuing the positive growth trends that have been developed in the past two years.

Overall, this is the most optimistic that industry participants have been in many years, and the panel felt that the upward trends forecasted have been hard-won results of a long battle to turn the industry around.

## VERTICAL FLIGHT

*Panel Leader:* David Lawrence Aviation Market Research

Participants:Andrea AastadDavid NapierAastad Company AssociationAerospace IndustriesBrandon BattlesMartin RosensteinConklin & deDecker AssociatesSikorsky AircraftChristine EberhardPierre HerronCommuniQuestPratt and Whitney

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## Introduction

The session focused initially on scheduled presentations by selected panel members, each of whom stressed key issues that could either constrain or enhance growth of the U.S. civil rotorcraft fleet during the forecast period.

Inappropriate route assignments and inadequate ground facilities have limited helicopter development in the past. These limitations could become dramatic with the introduction of high-speed, long-range tilt-rotor aircraft in the out-years.

There is a need for all-weather accessibility to scheduled destinations

• Icing issues are perhaps the most restrictive of the all-weather parameters.

 Noise concerns of communities in the 1980s are now more generalized as airspace concerns.

While mitigating technology was successfully demonstrated in the Atlanta Olympics Helistar project, explaining these problems and solutions to the public may be beyond the public relations capabilities of the smaller, less sophisticated commercial operators.

There is a continuing transfer of surplus military equipment to the civil marketplace. One thousand helicopters were surplussed between 1993 and mid-1997, 94 percent of which were UH-1s, OH-58s, and OH-6s. Of the total, 63 percent went to law enforcement agencies, and 40-50 percent of those are believed to be inactive. Of the total reported potential of 3,000 helicopters, at least half are expected to be transferred overseas. Thus, the impact on the U.S. fleet should trail off to zero during the next few years—although it will account for virtually all of the net fleet growth in the early forecast years, as noted below.

The apparent upturn in helicopter activity in the Gulf of Mexico continues. During the previous five years, flight hours and passenger activity had increased, but operational efficiencies had actually resulted in a decrease in the number of aircraft employed. In 1996, however, only light twin helicopters declined (by 0.8 percent). Single-engine helicopters increased by 3.2 percent, larger aircraft by 4.4 percent, and the total Gulf fleet by 2.7 percent. However, the much publicized extension outward is not yet in evidence and most of 43

the activity still takes place within 150 miles of shore.

The panel then addressed several issues that were posited to influence the fleet forecast.

## **Acquisition Costs**

While prices of new helicopters continue to rise, the perceived ratio of price to performance has improved to the point where fleet replacements are a growing share of new helicopter purchases, ranging from 40-50 percent in light helicopters to about 70 percent in the intermediates, according to a Pratt and Whitney Canada survey. The EC-120 and B407 were seen as examples of quantum improvements in aircraft performance with only moderate increases in price. It was felt that dramatic increases in price might inhibit further growth, but that decreases would not serve to expand the market. An exception to the relative indifference to price increases is the rapid escalation of spare parts prices, a continuing drag on the market.

The likely introduction of fractional ownership might account for additional sales during the forecast period, but at least some would be at the expense of projected single-owner sales.

## Technology

During the early years of the forecast, present and planned technological advances will stimulate new demand and increase fleet size. Most important among these is the development of the Global Positioning System (GPS), which will positively impact operating costs and perceived safety, and will significantly advance the accessibility of rotorcraft to their destinations under all-weather conditions. GPS will also permit tracking of aircraft through sensitive airspace in communities, thus permitting monitoring and enforcement of Fly Neighborly procedures and other measures to improve further improving helicopters' image and acceptance.

The most obvious new technology is the civil tiltrotor, which, in the out-years, is expected to stimulate new demand and to capture market share from small fixed-wing turboprops, particularly in the corporate/executive market. The degree to which this potential can be exploited will depend in large part on improvements in airspace management and the landside infrastructure.

#### Markets

In FAA's stipulated economic environment, key rotorcraft markets are expected to remain stable. Increased activity in offshore oil still has not translated into strong helicopter sales, but the potential for growth in Asia and on the Russian mainland still exists. Air medical markets, too, are growing slowly, and seem to show a drift back toward single-engine aircraft as these become more reliable.

# Regulation

The collective impacts of stricter European operating regulations (JAR Ops-3), prospective restrictions on noise, and possible user fees, while a potential factor in worldwide growth, were thought to be minimal on the U.S. fleet size. However, it might stimulate earlier replacement of nonconforming helicopters.

### **Comments on FAA Draft Forecast**

The vertical flight panel was unable to directly address FAA forecast worksheet because of a significant disparity between FAA's present estimate of the U.S. civil rotorcraft fleet (about 3,600) and that generally accepted by the industry (in excess of 6,000). The key difference seems to be in the respective estimates of active aircraft, and this may be related to the survey procedures used to gather the data. The panel did suggest convening a joint FAA-Industry working group to examine the problem.

The panel felt that a 1996 fleet of 6,000 aircraft would grow by 1.7 percent, 2.3 percent and 1.6 percent in 1997, 1998, and 1999 respectively; and by an average annual rate of 1.5 percent between 1996 and 2002. The implicit annual sales would, of course, translate to much higher growth rates if a fleet size of 3,600 were the used as a basis.

The panel projected an increase in hours flown per aircraft of between 1 percent and 2 percent per year from 1997 through 1999, and leveling off thereafter. Again, the resultant change in *fleet* flight hours would be substantially greater using industry's, rather than FAA's, estimates of fleet size.

The panel found no basis for challenging FAA estimates of the piston helicopter fleet size or flight hours.

### Suggested Improvements

In view of the disparity between FAA and industry estimates of the present turbine fleet size (3,600 vs. 6,000), the panel suggested that a joint FAA/industry work group be convened to reconcile the data. The key difference appears to be in the respective estimates of active aircraft, and this may be related to the survey procedure used to gather the data.

### **AIR CARGO**

Panel Leader: Anne Strauss-Wieder A. Strauss-Wieder, Inc.

Panelists: Magnus Bjorkman Pierre Herron Innova International Pratt & Whitney Canada Christopher Brehm Daniel Muscatello Price Waterhouse LLP Aviation Development Services, LLC John Cammett Aeroterm Airport Brian Clancy MergeGlobal, Inc.

Charles C. Erhard Washington Dulles International Airport

**Jim Esswein** Federal Express Morton Plumb Anchorage International

Carl Seiberlach **VZM** Transystems Corporation

George Stamos Federal Aviation Administration

Pierre Vilain Louis Berger & Associates, Inc.

### Introduction

The air cargo panel was a new addition to the workshop, and the group's objectives, therefore, differed from the other workshop panels. Specifically, the discussions held by the panel were geared toward laying a foundation and developing a framework for further discussion of air cargo. The two key questions addressed were:

What are the key trends and issues in the air cargo industry today?

Should the FAA resume air cargo forecasting?

This second objective was specifically posed to the panel by FAA to help provide insights into the need for additional or modified data.

The panel included representatives from airport operators and developers, carriers, manufacturers, and consultants to the industry. A wide range of trends and issues were discussed during the panel sessions, and FAA question was fully addressed. However, the panel recognized that these discussions and this summary should be considered only a starting point for more indepth deliberations.