THE EFFECTS OF ECONOMICS ON AVIATION SAFETY

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Background

Some economic factors which affect commercial aviation safety are fluctuating oil prices, recessionary trends, the Graham Rudman Hollings Deficit Reduction Act, the lack of access to the Aviation Trust Fund, product liability, and of course, the Aviation Deregulation Act of 1978. The following analysis focuses on the present deregulated environment as the overriding economic factor and views the others as perturbations which further aggravate the safety of the system.

Before discussing these economic factors and their impact on safety. it is appropriate to go back to 1981, three years after deregulation, when the professional Air Traffic Controllers (PATCO) went on strike. This action reduced the number of full performance level (FPL) controllers from 13,300 to about 7000. To keep the system operating, then FAA Administrator Helms put supervisory controllers back to working traffic, borrowed military controllers and put a cap on the traffic capacity. With these measures, the FAA felt the air traffic system was safe but wanted an independent view and asked the Flight Safety Foundation (FSF) to assess the system in the fall of 1981.

After several months of scrutiny, FSF concluded that the system was safe with these FAA restrictions. It was strongly recommended that the cap on air traffic be lifted gradually, only as the FPL complement was increased. (Other recommendations were offered, however, they are not pertinent to this discussion.)

The FAA chose to remove the traffic cap prior to acquiring a full complement of FPL's (As of the fall of 1987, the number of FPL controllers is still below staffing requirements). As a result of this action, by 1986, 9000 FPL controllers were handling 4,000,000 more flights annually than the 13,300 FPL's handled in 1980.

Assessment of Exposure to Risk

The panel concurred that safety cannot be accurately measured by accident statistics alone. Accidents in air carrier operations occur randomly and infrequently, and thus do not result in statistically valid data. Safety is better assessed by exposure to risk. The following discussion addresses economically related increases in exposure to risk.

The effects on safety brought about by the economic deregulation of the airlines can be conveniently grouped as (a) those most directly associated with the federal government and (b) those associated with airline operation. Of course, all factors are interrelated and affect the safety of operation of the overall commercial aviation system.

a. Risks Associated with the Federal Government. The annual number of all near mid-air collisions (NMAC) has increased from 475 in 1983 to over 850 in 1986. During August 1987 there were nearly two NMACs per day. This reflects the increase in traffic and the shortage of qualified controllers to handle that increase in traffic. Unfortunately, attempts to regulate traffic levels through slot allocation procedures would have serious economic consequences in that some operators would be forced out of the system.

There are shortages of qualified FAA personnel in the ranks of air carrier operations inspectors, maintenance inspectors and technicians, and navigational aid technicians. Airport security also suffers because security inspectors receive low pay and their job is uninteresting and repetitious.

Historically, the application of FAA research and development funding is controlled by events. Research money is at times reprioritized according to the most recent catastrophic event.

A soon-to-be-published General Accounting Office report cites four basic factors in assessing the safety health of an airline:

- Pilot competence
- Quality of maintenance
- Management attitude toward safety
- Financial stability

Currently, the FAA places greater emphasis on the first two items in their safety assessments. To our knowledge, these latter two items have not been utilized in assessing the safety of airline operations, although our panel concluded they were equally important.

Management attitude toward safety has a strong effect on how each airline employee carries out his responsibilities. The increased economic pressures brought on by intense competition in the dereglated environment can adversely affect safety if top management does not convey strong emphasis on safety throughout the organization.

A financially strapped airline may not have adequate resources for the safe conduct of its operations. Insufficient resources force management decisions regarding this allocation to areas of immediate need in order to survive. In this situation. it is not improbable that safety will be adversely affected.

Agencies such as the National Transportation Safety Board and the National Aeronautics and Space Administration have inadequate resources to fulfill their responsibilities and potential in the area of safety. The lack of rightful access to the billions of dollars in the Aviation Trust Fund is a deterrent to the ability of those agencies which are responsible to provide adequate input to safety needs. However, agencies have not always performed well even when

supplied with adequate funds. Then National Airspace System Plan is behind schedule and has suffered major cost overruns. The FAA has not been able to spend all the appropriated money for this plan.

b. Risk Associated With The Airlines. A recent Air Line Pilots' Association (ALPA) safety survey of its constituents revealed that 67% of those responding believed that safety had declined with economic deregulation. Twelve percent (12%) blamed the perceived safety reduction on decisions made by inexperienced airline managers many of whom have entered the airline industry since 1978. The pilots' concern is that these entrepreneurs may be more interested in economic efficiences than in safe operations. About half of the total respondents noticed a reduction in maintenance and/or airworthiness of the equipment they were flying.

Abuse of the Minimum Equipment List (MEL) concept appears to be reducing the integrity of maintenance and airworthiness. With the multiple redundance of some airworthiness items in today's commercial aircraft. MELs can be established which permit an aircraft, with specifically named items not operating, to be flown to the next facility where spare parts and certified maintenance personnel are available to effect a repair. In today's economic environment some airlines employ fewer certified maintenance personnel and stock fewer parts. This has resulted in situations where aircraft are flown for longer periods before proper maintenance is performed. In the meantime, other items may become inoperable, increasing the number of deferred maintenance items and increasing the exposure to risk. The MEL concept is carefully worked out for an aircraft by the operator. the manufacturer and the FAA. Used properly, it is a method of permitting limited continued operation with adequate safety provisions. The extended operation of aircraft with, at times, multiple deferred maintenance airworthiness items is not the intent of the MEL concept. Further complicating this situation are economic pressures under which a pilot feels obligated to take a flight against his better judgement.

A somewhat surprising result of the ALPA Safety Survey was that over 80% of the respondents cited carry-on baggage as a distinct safety hazard. The tie-in to economics here is the desire for a competitive edge. Airlines which allow almost anything to be brought aboard an aircraft can attract passengers who are well aware of the inconveniences of being separated from their baggage in the deregulated environment where flight cancellations and delays are not uncommon. What many passengers do not realize is that in turbulence encounters, these items of carry-on baggage can become lethal projectiles and, in a mishap situation, can seriously impede rapid egress. From the pilots standpoint, the five pounds carry-on weight per passenger figure used for weight and balance calculations, can amount to errors of as much as 4000 pounds in the actual takeoff weight on some jumbo-jets. From the airline's perspective, less passenger baggage in the cargo hold allows for more room for revenue-producing freight.

While the demand for experienced pilots, maintenance technicians and, as previously discussed, air traffic controllers increase, the reserve from which to draw is decreasing. The reserve of World War II, Korean conflict and Vietnam pilots is no longer there or is disappearing. Present FAA basic

minimum requirements for an airline pilot are that he/she be 23 years old and have a minimum of 1500 hrs. flying time. This means that a person with those basic qualifications can be hired by an airline (usually a regional airline) and, after as little as a year, can be eligible for captain. Because of the salary differences, after accumulating sufficient flying time, those regional airline pilots frequently move to one of the major air carriers. This tends to keep the experience level in the regionals relatively low, again increasing the exposure to risk.

Economic pressures of deregulation have encouraged extended operation of presently owned aircraft rather than replacing them with new models, thereby increasing the average age of the fleet. This, in itself, is not unsafe as long as these older aircraft are properly maintained. As previously mentioned, present maintenance procedures can be questionable. Further compounding the problem, more FAA maintenance surveillance is necessary to assure airworthiness of these aircraft, but sufficient experienced FAA maintenance inspectors are not available to adequately perform this task. Aircraft which had previously been sold to non-U.S. operators have, in some cases, been repurchased by U.S. operators which also places additional demands for the determination of airworthiness.

The numerous mergers, which have taken place to increase economic advantage, can adversely affect the resulting single organization. Seniority lists are changed, different operation and maintenance procedures are thrown together, and in some cases job security is threatened. All these can affect the attitude of the employee toward his job. and this can affect how well his responsibilities are carried out.

Economic pressures have resulted in some operators reducing or eliminating their engineering and safety staffs. This then results in more reliance on the manufacturer for engineering information and reduces or eliminates adequate safety oversight both within and outside the airline.

Conclusions

This panel came to the following conclusions: Deregulation has been imposed by the government, therefore, the government must assume its share of the responsibility in assuring an airline system in which the exposure to risk is reduced to an acceptable level. In order to do this, proper surveillance of operations and maintenance must be assured. Access to the Aviation Trust Fund would be a significant accomplishment if accompanied by careful planning in the use of these funds.

There should be assurance by the FAA that existing standards are being met. Recent concentrated examinations of specific airlines which have resulted in millions of dollars in penalties are an indication that all is not what it should be in the system. In addition closer monitoring of airline compliance with existing regulations, consideration should be given to strengthening some of these regulations or adding new ones to eliminate the potential abuse of safety to gain a competitive edge. Examples of items to consider are the misuse of the MEL concept and the procedures for carry-on baggage.

It is not enough to keep saying "The system is safe because there are so few major catastrophes." Exposure to Risk must be the safety criterion. Public acceptance of the safety of the airlines is not related to the large numbers of people who fly. In many cases flying is the only practical means of transportation. Public confidence in the system will only be achieved when indicators of decreased exposure to risk can be shown i.e., fewer delays, NMACs, runway incursions, pilot deviations, operational errors, and accidents.

Finally, a significant first step has been made by including a safety input to this economics-oriented workshop. It is clear to those of us in the field of safety that safety is, without a doubt, affected by actions which are intended to be purely economic, and we appreciate being included in this conference.

It is time the economic and safety experts join forces to achieve a common goal. The FAA, in its assessment of the safe operation of airlines, should utilize its economic specialists for evaluating financial stability in conjunction with its technical personnel for evaluating the GAO-identified indicators when assessing the safety health of airlines.

Discussion

Mr. Swanda (General Aviation Manufacturers Association): It is unclear to me what your bottom line was about the safety of the air traffic control system. Do you think the air traffic control system today is unsafe?

Mr. Wood: No; in fact, I testified about a year ago to that fact. I worked as a consultant with the GAO on their look at the air traffic control system five years after the strike. They asked me to work with them because the Foundation did its own study right after the strike. I testified that the system is not operating at the same level of safety as it was in 1981. That may sound like weasel wording, but that is the way we feel. Not unsafe, but not the same level that you had back then because there are fewer controllers and four million more flights to handle.

Mr. Nesbit: Safety came up in our panel, and the general feeling was that publicity about safety has not adversely affected demand for air travel. I would tend to support Blackburn's comment that the general public still feels the same. We pointed out that there is clear evidence that many times passengers avoid carriers, certain types of airplanes, and even airport when a safety problem is highlighted; so the public is sensitive to this issue and it cannot be dismissed lightly. This was particularly true with the Electra and the DC-10.