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RAMIFICATIONS OF THE RECENT FAA RULE FOR WINDSHEAR SYSTEMS ON THE DEVELOPMENT OF FORWARD-LOOKING SYSTEMS

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ABSTRACT

The recent FAA rule requiring windshear systems with flight guidance may have severe ramifications for the development of Infrared and other forward-looking systems. The industry needs to have and can have a more cost effective option through the use of a forward-looking system with a reactive backup instead of a reactive system with flight guidance. However, because of the short time for compliance with the new FAA rule, it is possible that existing transport aircraft will be in full compliance before a comprehensive investigation of all forward-looking systems can be completed. If this occurs, it is possible that the market for forward looking systems will be severely reduced, thereby eliminating the economic incentive to develop these much needed systems. Thus, to assure that this option is available for the airlines, it behooves the industry to immediately support an in-service evaluation of all available forward-looking systems.

PRESENTATION FOR THE

SECOND COMBINED MANUFACTURER'S AND

TECHNOLOGY AIRBORNE WIND SHEAR

REVIEW MEETING

OCTOBER 18 - 20, 1988

"RAMIFICATIONS OF THE RECENT FAA RULE FOR WINDSHEAR SYSTEMS ON THE DEVELOPMENT OF FORWARD LOOKING SYSTEMS"

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TURBULENCE PREDICTION SYSTEMS

CURRENT FAA REQUIREMENT:

Airborne reactive Low Level Wind Shear system with flight guidance.

AS AN INDUSTRY YOU NEED MORE OPTIONS...

ONE POSSIBLE OPTION:

An airborne reactive backup Low Level Wind Shear system with a TPS' airborne predictive Low Level Wind Shear and Clear Air Turbulence system.

i.e., Replace flight guidance with a predictive system capable of anticipating Low Level Wind Shear and Clear Air Turbulence.

ARE ANY PREDICTIVE SYSTEMS CURRENTLY CERTIFIED?

NO, a predictive air turbulence system has not yet been certified by the FAA.

ARE ANY PREDICTIVE SYSTEMS AVAILABLE FOR EVALUATION?

YES, Turbulence Prediction Systems has a system ready to evaluate in the commercial air transport sector now!

TURBULENCE PREDICTION SYSTEMS - ADVANCE WARNING SYSTEM

FEATURES:

Dual purpose system - LLWS and CAT

Meets industry standards proposed by SAE S7 sub-committee for a forward looking detection system.

Utilizes the industry standard Hazard Index (F Factor)

Meets military specifications

Bi-directional 429 ARINC buss i.e. capable of interfacing with current reactive Low Level Wind Shear systems

WHAT IS REQUIRED TO EVALUATE THIS SYSTEM?

An in-service evaluation on a commercial air transport.

IS THERE TIME TO EVALUATE THIS SYSTEM?

YES, TPS' system can be evaluated/certified within 1 year and can be available for installation during the 4th quarter of 1989.

WHAT ARE THE BENEFITS OF AN EVALUATION?

If successful, you will have increased safety with a cost-effective option.

COST BENEFIT OF OPTIONS

Option A Airborne reactive Low Level Wind Shear system with flight guidance or

Option B Airborne reactive Low Level Wind Shear system and Turbulence Prediction Systems' Airborne predictive Low Level Wind Shear and Clear Air Turbulence system

COST		Option A	Option B
Equipment			
Reactive System		$ 25,000.	$ 25,000.
Flight Guidance		10,000.	
Predictive System			50,000.
Miscellaneous Materials		10,000.	15,000.
Installation			
Reactive System	125 hrs § $50/hr	6,250.	6,250.
Flight Guidance	125 hrs § $50/hr	6,250.	
Predictive System	125 hrs § $50/hr		6,250.
Re-Certify			
Flight Guidance	20 hrs § $100/hr	2,000.	0.
Training			
Simulator Modifications		20,000.	
Flight Guidance	4 hrs/person		
	x 2 people/crew		
	x 5 crews/aircraft		
	x $500 per hour	$ 20,000.	$ 0.
Total Direct Cost per aircraft 1st yr		$ 99,500.	$102,500.
Down Time			
Reactive System	125 hrs § $500/hr	62,500.	62,500.
Flight Guidance	125 hrs § $500/hr	62,500.	
Predictive System	125 hrs § $500/hr		62,500.
Total Indirect Cost per aircraft 1st yr		$125,000.	$125,000.
Total Cost per aircraft 1st year		$224,500.	$227,500.

ANNUAL SAVINGS DUE TO CAT AVOIDANCE

$14.25/flight* x 2,000 flights/yr	$ 0.	$ 28,500.

* Cost of CAT $6.00/flight expressed in 1964 dollars "Report of the National Committee For Clear Air Turbulence"; U.S. Department of Commerce; December 1966, pp 37.

WHY SHOULD THE AVIATION INDUSTRY EVALUATE FORWARD LOOKING SENSORS NOW?

Once the existing fleet, i.e. retrofit, is in compliance with the mandated FAA windshear systems, it is very likely that forward looking sensors will not be required for these aircraft.

Thus, if the retrofit market is precluded as a potential market for a forward-looking sensor, there will be little, if any, economic incentive to begin or complete development of these forward-looking sensors for the balance of the potential market (i.e., approximately 300 new transports manufactured each year).

FOR AN UPDATE ON THE STATUS OF TPS' SYSTEM TESTS, SEE AIAA-88-4659 TITLED:

"AIRBORNE PASSIVE INFRARED SYSTEM FOR THE ADVANCE WARNING OF LOW-LEVEL WINDSHEAR AND CLEAR AIR TURBULENCE: 1988 IN-SERVICE AND THEORETICAL WORK"

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TO INSURE THAT THERE IS A MARKET FOR FORWARD-LOOKING SENSORS, WHAT IS REQUIRED?

A SCHEDULED AIR CARRIER IS NEEDED TO JOIN WITH TPS AND OTHERS IN AN IN-SERVICE EVALUATION OF THIS ALTERNATIVE NOW!!!