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An InFO contains valuable information for operators that should help them meet certain administrative, regulatory, or operational requirements with relatively low urgency or impact on safety.

Subject: Flight Risk Assessment Tool

Purpose: This InFO describes the proactive identification of possible hazards and the use of risk management tools to mitigate risks as aspects of a Safety Management System (SMS). These tools will provide ways for air operators to determine which flights have more risk and allow operators to intervene and reduce risk when possible. *Risk assessment tools are only part of an SMS and should not be considered the whole system.*

Background: Over the years the Federal Aviation Administration (FAA) and the aviation industry have dramatically increased the safety of air travel by managing and mitigating risks associated with flight. The aviation industry currently provides the safest form of transportation in the United States. However, the industry continues to have some accidents that can be prevented. Therefore, both the FAA and industry are working to continually improve the safety record of turbine-powered aircraft. Over the next few years, the FAA will encourage operators and certificate holders to develop Safety Management Systems (SMS). This safety protocol is described in Advisory Circular (AC) 120-92, Introduction to Safety Management Systems for Air Operators.

The Turbine Aircraft Operations Subgroup as part of the General Aviation Joint Steering Committee has developed a risk assessment tool for use in flight operations. In creating this tool, the Turbine Aircraft Operations Subgroup reviewed accident data, identified hazards, and used normal risk assessment development methodology. This tool provides a simple way to implement proactive risk management. An operator can use the risk assessment tool as a stand-alone tool but incorporating it into an SMS is preferable.

Discussion: As discussed in AC 120-92, a hazard is defined as any existing or potential condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite of an accident or incident.

Every flight has hazards and some level of risk associated with it. It is critical that operators and pilots are able to differentiate, in advance, between a low risk flight and a high risk flight, and then establish a review process and develop risk mitigation strategies to address flights

throughout that range. A risk assessment tool should allow operators and pilots to see the risk profile of a flight in its planning stages. Each operator should determine an acceptable level of risk for its flights based on the type of operation, environment, aircraft used, crew training, and overall operating experience. When the risk for a flight exceeds the acceptable level, the hazards associated with that risk should be further evaluated and the risk reduced. A higher risk flight should not be operated if the hazards cannot be mitigated to an acceptable level.

The attached risk assessment tool has been developed for use in understanding different levels of flight risk and to allow operators and pilots to become familiar with this element of an SMS. It is important for operators to understand that risk has several elements that must be considered, including probability, severity, and weighted value. What is the probability of a particular event occurring? If the event does occur, what is the severity likely to be? And what is the weighted value of this type of event compared to other aspects of the operation? In the attached risk assessment tool, this work has been done so the operator has a simplified form of the tool. Each operator may want to add items that are unique to its operation using the additional resources provided. An operator can also change any item currently used in the tool provided it conducts a realistic assessment of the hazard being changed.

To use the tool, the operator will need to create numerical thresholds that trigger additional levels of scrutiny prior to a go/no-go decision for the flight. These thresholds should be created to help ensure that the safety standards of each individual operation are maintained. However, it is important that the operator create realistic thresholds. If every flight is within the acceptable range under any condition, it is likely that the thresholds have not been set correctly. Small operations (for example, where the pilot is also the chief pilot and owner) should consider strategies for appropriate consideration of elevated risk that best fit their operation.

Recommended Action: The FAA recommends that operators and pilots familiarize themselves with the attached risk assessment tool and AC 120-92. They should then decide whether to use the tool as published or to modify it as needed for their own operations. Once an operator has established the parameters of the tool, it should create operational thresholds and begin using the tool to establish a “risk number” for each flight. This risk number should be used to control risk before a flight takes place. Over time this tool will become unique to each operator and can become a part of its complete SMS. *The risk assessment tool cannot guarantee a safe flight—safety is ultimately the responsibility of the pilot and operator. However, it does provide an additional tool to help the pilot and operator make sound safety decisions.*

Flight Risk Assessment Tool			
Date: _____		Departure: _____	
Release/Trip #: _____		Risk Value	Flight Value
Tail #: _____			
Pilot Qualifications and Experience			
1	Captain with less than 200 hours in type	5	
2	First Officer with less than 200 hours in type	5	
3	Single Pilot Flight	5	
4	Captain with less than 100 hours last 90 days	3	

5	First Officer with less than 100 hours last 90 days	3	
6	Duty day greater than 12 hours	4	
7	Flight time (Greater than 8 hours in the duty day)	4	
8	Crew Rest (Less than 10 hours prior to the duty day)	5	
Total Factor Score - Section 1			
Operating Environment			
9	VOR/GPS/LOC/ADF (Best approach available w/o vertical guidance)	3	
10	Circling approach (best available approach)	4	
11	No published approaches	4	
12	Mountainous airport	5	
13	Control tower not operational at ETA or ETD	3	
14	Uncontrolled airport	5	
15	Alternate airport not selected	4	
16	Elevation of primary airport greater than 5000 ft. MSL)	3	
17	Wet runway	3	
18	Contaminated runway	3	
19	Winter operation	3	
20	Twilight operation	2	
21	Night operation	5	
22	Stopping distance greater than 80% of available runway	5	
23	Repositioning flight (no passengers or cargo)	5	
24	Pop up trip (Less than 4 hours crew notice)	3	
25	International operation	2	
26	No weather reporting at destination	5	
27	Thunderstorms at departure and/or destination	4	
28	Severe turbulence	5	
29	Ceiling & visibility at destination less than 500 ft. / 2 sm	3	
30	Heavy rain at departure and/or destination	5	
31	Frozen precipitation at departure and/or destination	3	
32	Icing (moderate-severe)	5	
33	Surface winds greater than 30 knots	4	
34	Crosswinds greater than 15 knots	4	
35	Runway braking action less than good	5	
Total Factor Score - Section 2			
Equipment			
36	Special Flight Permit Operation (ferry permit)	3	
37	MEL / CDL Items (items related to safety of flight)	2	
38	Special flight limitations based on AFM equipment limitations	2	
Total Factor Score - Section 3			
TOTALS			

Example: Use of Flight Risk Assessment Tool

The following discussion provides a practical example of the five step process used to assess risk as outlined in AC 120-92. The example involves the operation of a night flight where the destination airport is experiencing windy, rainy conditions. The captain has fewer than 200 hours in type, and the first officer has flown less than 100 hours in the last 90 days. The company SOPs require the Chief Pilot to evaluate flight risk factor values over 20 from the perspective of

accepting the risk, rejecting the risk, or mitigating the risk. Further, the company SOPs prevent the operation of a flight if the risk value exceeds 25. In our example the non-parenthetical numerical value represents the original risk value assigned to the hazard. Risk values in parenthesis represent the reduced risk values assigned after the Chief Pilot acted to mitigate the risks.

Step 1. Complete a system and task analysis.

- The captain is not highly experienced with less than 200 hours in type.
- The first officer has less than 100 hours in the last 90 days.

Step 2. Identify the hazards.

- The runway is wet.
- The flight will operate at night.
- The destination crosswinds are greater than 15 knots.

Step 3. Analyze the safety risk.

- The combination of the risk factors associated with this flight generates a risk value of 20 using the example risk assessment tool.

Step 4. Assess the safety risk.

- Company policy requires that the Chief Pilot assess and approve any flight risk value greater than 15. Since the risk value of 20 exceeds the company operational threshold risk of 15, the Chief Pilot decides to operate the flight by reducing the flight risk value to a more acceptable level.

Step 5. Control the safety risk.

- The Chief Pilot focuses on mitigating three hazards.
 1. He decides to allow the scheduled captain to operate the flight.
 2. However, he assigns the flight to a first officer who is more current and who has flown more than 100 hours in the last 90 days.
 3. Further, the Chief pilot changes the destination airport to an airport with no crosswind expected.
- By controlling the risk value of these three hazards, the Chief Pilot has reduced the flight overall risk value to 13 and elevates the operational level of safety.

Flight Risk Assessment Tool					
Date: <u>Any day</u>		Departure: <u>DAL</u>		Risk Value	Flight Value
Release/Trip #: <u>153</u>		Destination: <u>PDK</u>			
Tail #: <u>N123</u>					
Pilot Qualifications and Experience					
1	Captain with less than 200 hours in type			5	5
2	First Officer with less than 200 hours in type			5	
3	Single Pilot Flight			5	

4	Captain with less than 100 hours last 90 days	3	
5	First Officer with less than 100 hours last 90 days	3	3 (0)
6	Duty day greater than 12 hours	4	
7	Flight time (Greater than 8 hours in the duty day)	4	
8	Crew Rest (Less than 10 hours prior to the duty day)	5	
Total Factor Score - Section 1			8 (5)
Operating Environment			
9	VOR/GPS/LOC/ADF (Best approach available w/o vertical guidance)	3	
10	Circling approach (best available approach)	4	
11	No published approaches	4	
12	Mountainous airport	5	
13	Control tower not operational at ETA or ETD	3	
14	Uncontrolled airport	5	
15	Alternate airport not selected	4	
16	Elevation of primary airport greater than 5000 ft. MSL)	3	
17	Wet runway	3	3
18	Contaminated runway	3	
19	Winter operation	3	
20	Twilight operation	2	
21	Night operation	5	5
22	Stopping distance greater than 80% of available runway	5	
23	Repositioning flight (no passengers or cargo)	5	
24	Pop up trip (Less than 4 hours crew notice)	3	
25	International operation	2	
26	No weather reporting at destination	5	
27	Thunderstorms at departure and/or destination	4	
28	Severe turbulence	5	
29	Ceiling & visibility at destination less than 500 ft. / 2 sm	3	
30	Heavy rain at departure and/or destination	5	
31	Frozen precipitation at departure and/or destination	3	
32	Icing (moderate-severe)	5	
33	Surface winds greater than 30 knots	4	
34	Crosswinds greater than 15 knots	4	4 (0)
35	Runway braking action less than good	5	
Total Factor Score - Section 2			12 (8)
Equipment			
36	Special Flight Permit Operation (ferry permit)	3	
37	MEL / CDL Items (items related to safety of flight)	2	
38	Special flight limitations based on AFM equipment limitations	2	
Total Factor Score - Section 3			0
TOTALS			20 (13)

Questions or comments on this InFO should be addressed to Peter Neff, AFS-820, (202) 493-5400.