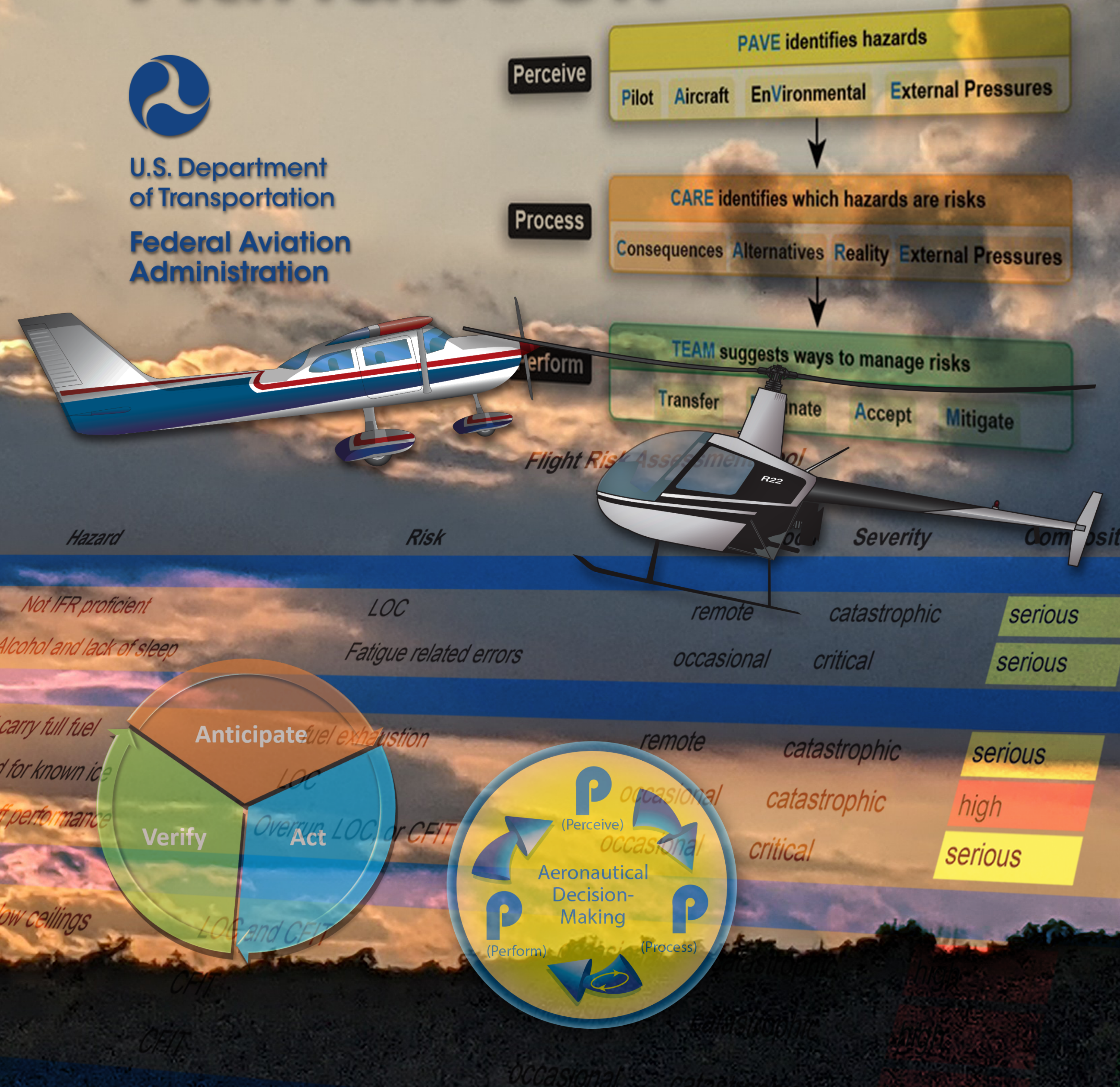
FAA-H-8083-2A

# Risk Management Handbook


U.S. Department of Transportation
Federal Aviation Administration

# Table of Contents

# Chapter 2: Personal Minimums

## Introduction

Federal regulations that apply to aviation do not cover every situation nor do they guarantee safety. For example, a pilot may legally fly in marginal VFR conditions at night even though low visibility and night hazards increase the risk for an incident or accident. Therefore, pilots should consider non-mandatory self-regulation in the form of personal minimums.

## Personal Minimums

Pilots who understand the difference between what is "smart" or "safe" based on pilot experience and proficiency establish personal minimums that are more restrictive than the regulatory requirements. The following six steps allow pilots to establish a set of personal minimums in order to reduce risk and fly with greater confidence.

### Step 1—Review Weather Flight Categories

Establishing personal minimums normally begins with weather, and pilots should know the range of ceiling and visibility that defines each category. [*Figure 2-1*]

| Category | Ceiling | | Visibility |
|---|---|---|---|
| Visual Flight Rules<br>VFR | Greater than 3,000 feet AGL | and | Greater than 5 miles |
| Marginal Visual Flight Rules<br>MVFR | 1,000 to 3,000 feet AGL | and/or | 3 to 5 miles |
| Instrument Flight Rules<br>IFR | 500 to below 1,000 feet AGL | and/or | 1 mile to less than 3 miles |
| Low Instrument Flight Rules<br>LIFR | below 500 feet AGL | and/or | less than 1 mile |

**Figure 2-1.** *Weather category values for ceiling and visibility.*

### Step 2—Assess Experience and Comfort Level

Pilots should also take a few minutes to complete the certification, training, and experience summary in *Figure 2-2* by filling in the right column. Some pilots fly different aircraft categories and classes and may develop different personal minimums based on the specific aircraft flown. For example, many pilots will have a different set of personal minimums when flying a single-engine airplane versus a multiengine airplane. Depending on pilot experience, the minimums in a multiengine airplane could be higher than the single-engine airplane minimums. Pilots may use the information entered in *Figure 2-2* to set personal minimums for a variety of situations using tables in *Figure 2-3*, *Figure 2-4*, and *Figure 2-5*.

**Experience and “Comfort Level” Assessment**
**VFR & MVFR**

| Weather Condition | | VFR | MVFR |
|---|---|---|---|
| Ceiling | | > 3,000 | 1,000–3,000 |
| | Day | — | 2,500 |
| | Night | 5,000 | — |
| Visibility | | > 5 miles | 3–5 miles |
| | Day | — | 4 miles |
| | Night | 8 miles | — |

**Figure 2-3.** *A sample pilot experience and comfort level assessment for VFR and MVFR.*

For IFR, *Figure 2-4* shows how a pilot recorded the lowest IFR conditions recently and regularly experienced. Although a pilot may have successfully flown in low IFR (LIFR) conditions, it does not mean the pilot was “comfortable” in these conditions. In this example, the pilot did not fill in the LIFR boxes for known “comfort level” in instrument meteorological conditions (IMC) after deciding to avoid flight in those conditions.

**Experience and “Comfort Level” Assessment**
**IFR & LIFR**

| Weather Condition | | IFR | LIFR |
|---|---|---|---|
| Ceiling | | 500–999 | < 500 |
| | Day | 800 | — |
| | Night | 999 | — |
| Visibility | | 1–3 miles | < 1 mile |
| | Day | 1 mile | — |
| | Night | 3 miles | — |

**Figure 2-4.** *A sample pilot experience and comfort level assessment for IFR and LIFR.*

If combined into a single table, the summary of a pilot’s known “comfort level” for VFR, MVFR, IFR, and LIFR weather conditions might appear as shown in *Figure 2-5*.

**Experience and “Comfort Level” Assessment**
**Combined VFR & IFR**

<table>
<tr><th colspan="2">Weather Condition</th><th>VFR</th><th>MVFR</th><th>IFR</th><th>LIFR</th></tr>
<tr><td>Ceiling</td><td></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td></td><td>Day</td><td colspan="2">2,500</td><td colspan="2">800</td></tr>
<tr><td></td><td>Night</td><td colspan="2">5,000</td><td colspan="2">999</td></tr>
<tr><td>Visibility</td><td></td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td></td><td>Day</td><td colspan="2">4 miles</td><td colspan="2">1 mile</td></tr>
<tr><td></td><td>Night</td><td colspan="2">8 miles</td><td colspan="2">3 miles</td></tr>
</table>

**Figure 2-5.** *Experience and comfort level assessment for combined VFR and IFR.*

## Step 3—Consider Other Conditions

Pilots should also have personal minimums for wind and turbulence and record the most challenging wind conditions comfortably experienced during the last six to twelve months. As shown in *Figure 2-6*, a pilot may record these values for category and class, or for a specific aircraft.

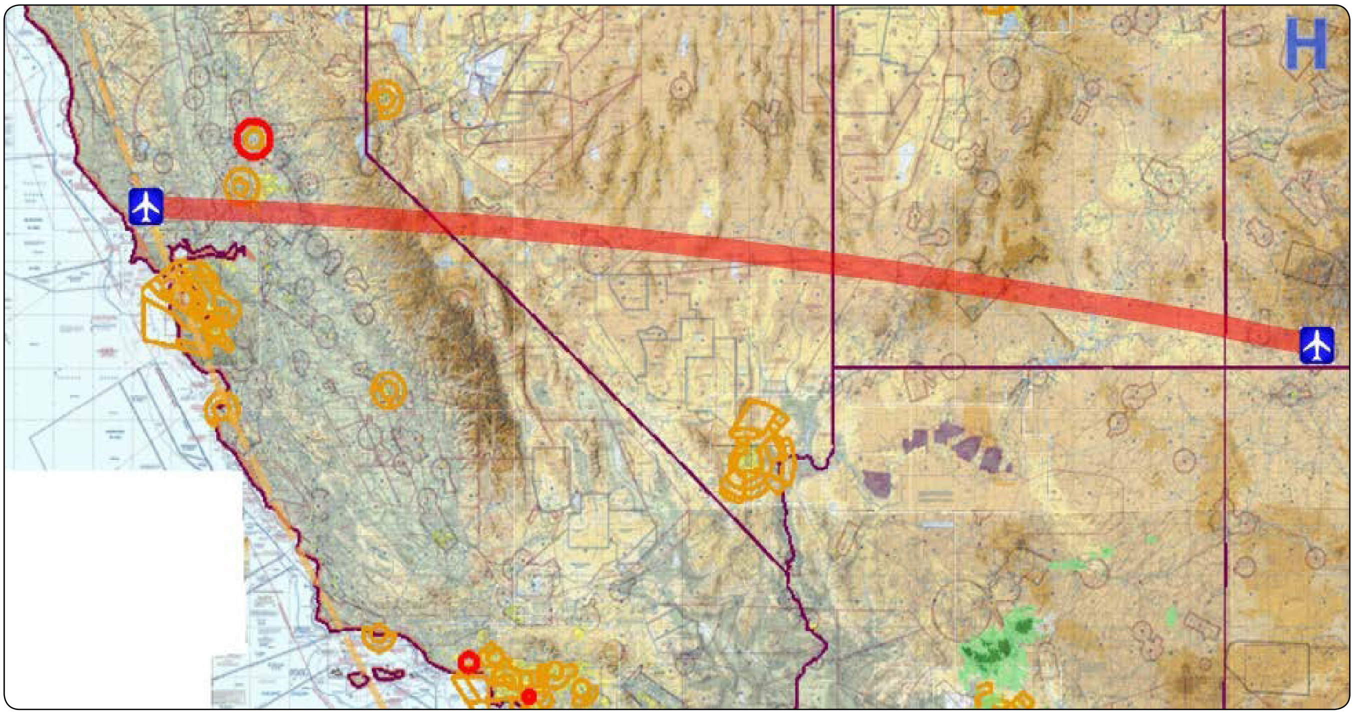


**Figure 3-9.** *The direct route from Durango to Santa Rosa.*

Tricia makes a quick analysis and figures she can fly this trip nonstop in just under five hours, with 6 hours and 45 minutes of endurance with full tanks. She then evaluates the weather and immediately foresees some challenges.

A low-pressure system with a trailing cold front is moving south into northwest Colorado. The front is triggering severe convective activity as it collides with moist air in the southwest. Low ceilings and poor visibility are widespread behind the front, with mountain obscuration and icing in clouds above 8,000 feet. The weather in Durango should remain good VFR on Monday, but change to IMC early Tuesday morning as the weather system slowly moves southeast.

## Data

Tricia needs to organize, consider, and evaluate all the information.

### *Pilot and Passengers*

The pilot and passenger data is as follows:

- Current under 14 CFR part 61 for VFR and IFR
- Last instrument time logged four months ago
- Tricia's weight is 130 pounds, the Smiths weigh 340 pounds together
- Tricia has 40 pounds of baggage, the Smiths have 80 pounds

### *Aircraft*

The aircraft data is as follows:

- Not certificated for flight in known icing conditions
- Empty weight: 1903 pounds, Maximum gross weight 2,740 pounds
- Luggage compartment carries 120 pounds
- Current fuel 25 gallons (150 pounds) Fuel capacity 64 gallons (384 pounds)
- Average fuel consumption at 10,000 feet: 8.6 gallons per hour

### *Proficiency*

A pilot who remains proficient is better prepared to defend against threats, errors, and undesired aircraft states. This can be depicted in the context of a Swiss cheese model. Each piece of Swiss cheese is a component of the defense against threats, errors, and undesired aircraft states. [*Figure 6-1*] Each of the holes in the cheese is a weakness in those defenses. A greater level of proficiency reduces the likelihood the holes will align.

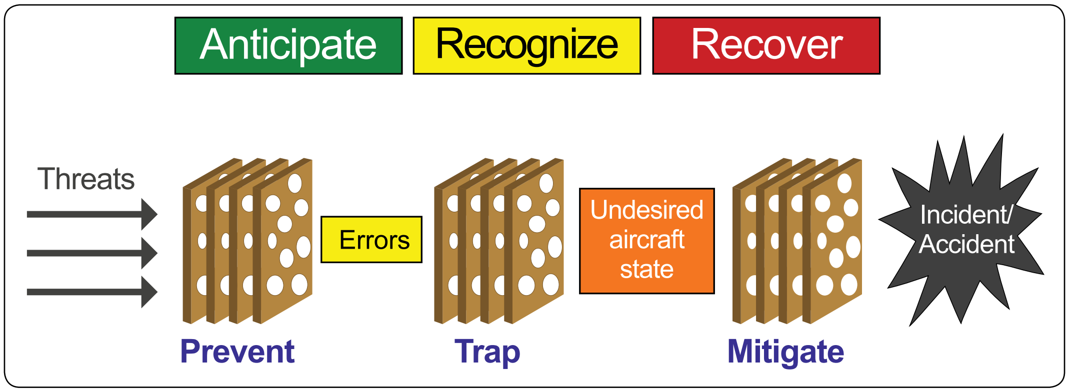



**Figure 6-1.** *The Swiss cheese model.*

### *Discipline*

Discipline stems from good training and habit patterns. A disciplined pilot will perform a task in a similar manner each time regardless of proficiency. For example, completing the preflight inspection of the aircraft by using and following the approved checklist every time is a mark of discipline. Discipline also affects aeronautical decision-making. A disciplined pilot will be guarded and inoculated against hazardous attitudes and operational pitfalls, as shown in *Figure 6-2*. In general, a disciplined pilot will always do the right thing. Just like proficiency, discipline will lessen the likelihood that a threat or error will find a path through the pilot defenses.

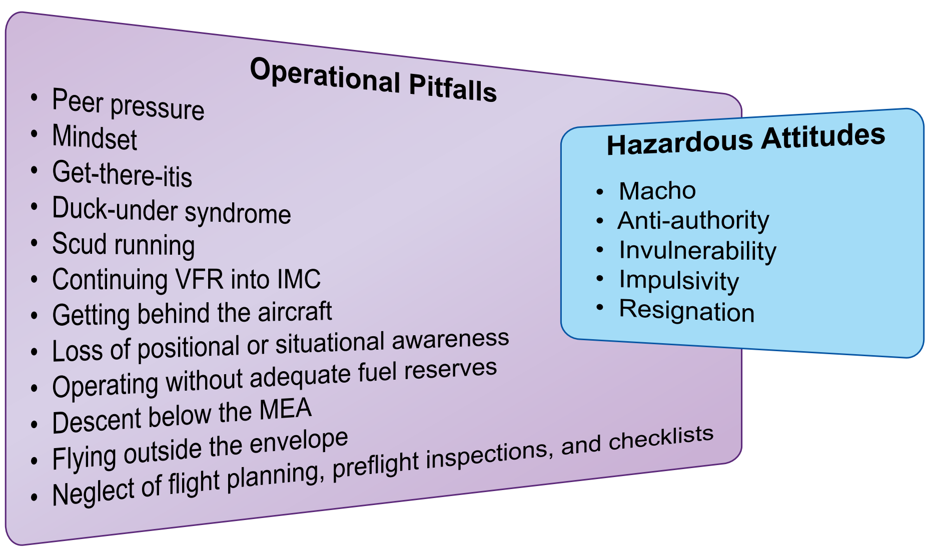



**Figure 6-2.** *Operational Pitfalls and Hazardous Attitudes.*

## Chapter Summary

Defenses against threats and errors are either provided to the pilot or provided by the pilot. Pilots should perceive threats and errors and respond appropriately. The response may require the use of an appropriate checklist or may require more complex decision-making. A trained, proficient, and disciplined pilot uses appropriate threat and error management strategies to prevent or recover from an undesired aircraft state.


**Figure B-5.** *3P "Perceive" analysis and PAVE checklist risk identification.*

## Additional Risk Assessment Tools

The CARE checklist provides a breakdown of rationale pilots use during the 3P "process" stage [*Figure B-6*]. It includes a perspective of what could happen (consequences), what may be done to prevent an unwanted outcome (alternatives), a check of the actual conditions (reality), and an analysis of pilot motivation (external pressures).

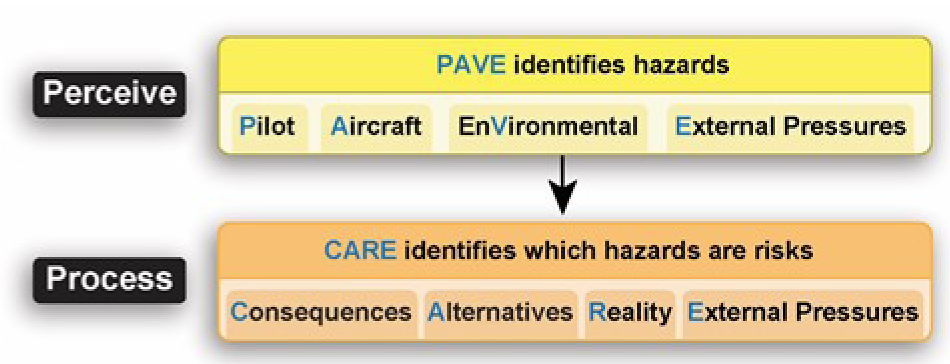



**Figure B-6.** *Process using the CARE checklist for risk assessment.*

## Risk Mitigation Tools

The TEAM checklist shares the "perform" step in the 3P model as well as the "alternatives" component from the CARE checklist.

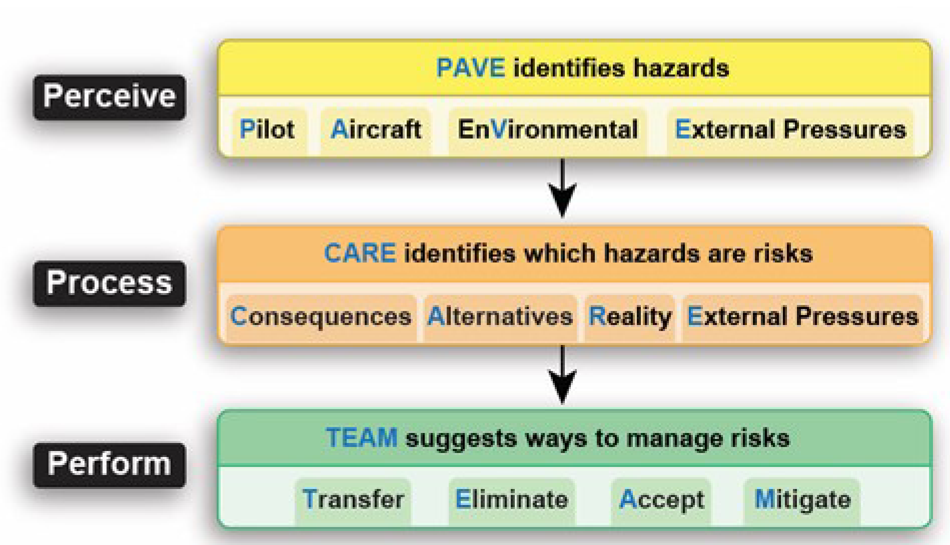



**Figure B-7.** *"Perform" using the TEAM checklist for risk mitigation.*

Analysis of hazards and associated risks may follow the six-step DECIDE Model shown in *Figure B-8*.