



## **Recommended Considerations for Selecting an Upset Prevention and Recovery Training Provider**

### **General Considerations**

At this time UPRT is an unregulated area of training. It is incumbent upon those seeking instruction in this field to ask appropriate questions to assess the effectiveness and safety of training. These questions are provided as a guide in selecting a training provider that can provide training that will effectively reduce your Loss of Control In-flight (LOC-I) risk by equipping you with knowledge and skills appropriate to prevention and recovering from an unexpected airplane upset event.

A general tenet of UPRT is that it should be designed to better prepare flight crew members to recognize and avoid situations that are conducive to encountering an in-flight upset; in other words, focusing on 'prevention'. Notwithstanding, any risk mitigation effort would be incomplete without including recovery training.

Because this is a new area of training, there is significant risk of negative training – imparting lessons that are incorrect or even dangerous if misapplied. You owe it to yourself to investigate your UPRT provider. As with any professional services, references from past clients may provide valuable information.

### **Training Programs**

- Does the training program adhere to the Airplane Upset Recovery Training Aid guidance?  
Though designed for swept wing airplanes of 100 passengers or more, the Airplane Upset Recovery Training Aid has been vetted by industry and was created expressly for use in the creation of UPRT programs of instruction.  
[AirplaneUpsetRecoveryTrainingAid.pdf](#)
- Does the training program contain academic preparation?  
Knowledge plays a fundamental role in the UPRT framework. The required academic basis should be designed to equip pilots with the knowledge and awareness needed to understand the threats to safe flight and the employment of mitigating strategies.
- Is academic instruction provided prior to practical training?  
Theoretical recovery strategies should be taught prior to practical training as a helpful way of maximizing resources, in both FSTD and airplane training.

- Are academic training elements directly related to a scheduled flight or FSTD training session?  
This creates a bridge from the classroom to flight so that information can be put to use to consolidate learning. Care should be taken to minimize delays between delivering pre-flight briefings and conducting practical training.
- Is it possible to view their training program?  
Visibility helps to assess formality, structure, and standardization. Look for a building block approach which helps a student build upon developing skills in a progressive fashion. If the information is considered proprietary and is not available, you should still be able to ask enough questions to ascertain the level of sophistication of training.
- Is the training based on the statistical threat distribution?  
This helps you to determine if the training is effective in dealing with threats as they are actually experienced in the real world, not just maneuvers or exercises that don't relate to the LOC-I problem.
- Is the course strictly an aerobatic course?  
While most UPRT programs will incorporate elements of aerobatic maneuvering, research has shown that training specifically devoted to recovery from upsets is more effective than aerobatics alone. A UPRT provider should be able to articulate the difference between aerobatics and UPRT, and why that distinction is important.
- Is the training related to a specific aircraft type?  
The principles of UPRT are broadly applicable among many fixed-wing aircraft types. Concepts should be introduced in a manner which can be applied in many aircraft over the span of a pilot's career. The delivery of UPRT in an aeroplane should not be focused on airplane-specific performance or features. Appropriate use of airplane training platforms for the delivery of UPRT should emphasize the introduction of general principles of understanding and techniques which may be applied to a wide range of airplanes and are not in conflict with commercial air transport airplane recovery techniques.

These statements do not apply to UPRT delivered as part of type-specific initial or recurrent training.

- Is the Training Program Certified by Regulatory Agencies?  
Though not currently mandated, training operations that delivery UPRT may benefit from the formal review process required for regulatory approval.
- Is Crew Resource Management addressed?  
In the existing unusual attitude training paradigm, it is common for instructors or pilots in training initiate an upset event for their training partner. Then a pilot demonstrates his or her ability to recover from that situation alone. While it is essential that pilots must first learn and apply UPRT concepts and techniques individually to reach proficiency,

advanced UPRT should address the application of upset prevention and recovery in a crew environment, just as other abnormal and emergency situations are.

- Is there sufficient practice time?  
For all training courses and operations there is always an effort to minimize the scheduling footprint. While proper instructional design and instructor competency can create efficiencies, realize that there is a minimum amount of practice which is required to reach proficiency and foster retention.

## **Practical Skill Development**

As essential as theoretical instruction is to fostering an academic approach to upset prevention and recovery, a solely theoretical approach without practical skill development has limited effectiveness. In high threat situations such as aeroplane upsets, mental ability can be severely diminished. Practical exposure under controlled conditions is essential to complement the theoretical training and improve the pilot's ability to manage threatening events.

UPRT practical skill development can be delivered in both airplane and Flight Simulation Training Device (FSTD) platforms, to include continuous G devices. All training devices possess certain capabilities and limitations. Training must respect the limitations of device fidelity, transfer of training, and proper instructional technique that emphasizes relatable learning elements while pointing out areas of invalid training or inappropriate transfer in both airplane and FSTD based UPRT.

While a useful component of overall flight training and UPRT, current FSTDs have limitations that render them incapable of providing the complete exposure to conditions encountered in preventing or recovering from an actual LOC-I event in flight. Limitations in FSTD motion cueing and the reduced emotional response create boundaries that prevent pilots from experiencing the full range of airplane attitudes, load factors and behavior that can be present during an actual flight. These areas of missing experience provide gaps in pilots' understanding and proficiency when confronted with an actual upset.

UPRT on airplanes provided by competent instructors should compensate for these gaps by being part of UPRT. This airplane-based UPRT provides physiological and psychological exposure geared toward upset prevention and recovery which creates a frame of reference that can be transferred to the FSTD environment. The practice and application of skills acquired during airplane-based UPRT provides experience and confidence that cannot be fully acquired in the simulated environment alone. For this reason UPRTA strongly advocates that all pilots should receive UPRT in actual flight at some point in their flying career.

## **UPRT in Airplanes**

There are many aircraft that can be used in the delivery of UPRT. In all cases, airplanes used should provide a margin of safety for the maneuvering to be performed. In some cases, multiple aircraft types are used in an integrated fashion to provide different elements of training. This

allows the use of an all-attitude/all-envelope capable aircraft to augment aircraft which may be used to demonstrate specific elements of UPRT instruction.

In all cases care should be taken to ascertain that the aircraft is being used within an appropriate operating envelope which provides necessary margins of safety for the training being conducted.

All-attitude maneuvering should be conducted in aircraft that are certified in the Acrobatic category, or in the case of Surplus Military Turbine Aircraft, within the limits of their original certification. Other aircraft should be operated in a manner consistent with their certification or defined limitations specific to their role as a UPRT training platform, and which provides an acceptable margin of safety for that use.

### **Aircraft Considerations**

- How is the maintenance?  
Airplanes used in the delivery of UPRT generally operate in a more rigorous, dynamic, and demanding environment than most flight operations. Determine what the maintenance schedule is to determine that structural fatigue or other issues will be caught before they pose a threat.
- How about egress from the airplane?  
For aircraft used in an all-attitude role or the delivery of spin instruction the ability to get out of the airplane in an emergency should be evaluated.

### **Flight Operations Considerations**

- Are operational guidelines in place specific to the delivery of UPRT?  
An example includes minimum altitudes that provide a greater margin of safety than regulatory minimums.
- Does the Training Organization have a Safety Management System?  
This can help address threats and hazards specific to UPRT operations and identify mitigating strategies that reduce exposure and improve overall safety.
- How is the airspace?  
Airport access and traffic in maneuvering airspace are two aspects of airspace impact on training operations.

### **UPRT in Simulators**

- Has the device been evaluated for use in the delivery of UPRT?  
If not, what criteria are being used to determine the boundaries of the valid training envelope?
- Is feedback available to the instructor specific to the needs of UPRT?

Many parameters that are not required for training in normal flight operations can be beneficial in the context of UPRT.

- Has the instructor received training in UPRT and in how to deliver UPRT instruction?  
Much of UPRT is counter-intuitive to normal flight operations. Without instruction and practice in proper methodology, common student errors, high-risk techniques, aerodynamic principles and strategic priorities the opportunity for incorrect messaging and negative training poses a threat. Just as an instructor should not be permitted to teach any other subject area in which they have not been trained, the delivery of UPRT requires that an instructor be specifically trained for the UPRT role.
- Has the instructor received UPRT in an aircraft to expose the fidelity and human factors limitations which exist when delivering UPRT in an FSTD?  
If they have not, then how will they know where the limits of the valid training envelope are and how to adequately prepare pilots for the differences that they will encounter when experiencing an unexpected upset event in flight?

### UPRT Instructors

An essential component in the effective delivery of UPRT is a properly trained and qualified instructor who possesses sound theoretical and operational knowledge relevant to the UPRT content. Beyond training effectiveness, UPRT instructor capability is the greatest mitigation in delivering UPRT in flight.

The UPRT airplane training environment encompasses a broader range of attitudes and angles of attack than other flight training operations. The unpredictable nature of trainee inputs, reactions, and behavior requires fluency in response to a wide variety of potential situations requiring a time-constrained and accurate response. This specialized expertise cannot be acquired through routine flight operations alone, but demands that instructor training provides the appropriate degree of exposure necessary to develop a comprehensive understanding of the entire UPRT operating environment, as well as the airplane's limitations and capabilities.

There are three major areas of experience that are beneficial for effective UPRT:

#### 1) All-attitude/All-envelope domain experience

Significant experience with all-attitude/all-envelope flight provides a UPRT instructor with the capacity to project the airplane's flight path and energy state based on present conditions with consideration to both current and anticipated flight control inputs. This experience allows the ability to foresee the development of flight conditions which might exceed airplane limitations and to act swiftly and appropriately to preserve necessary margins of safety. Further, it provides the skills necessary to recover the airplane in those instances when corrections are required which could exceed the capabilities of the trainee, and to determine when it is necessary to discontinue training to maintain safety.

Background experience can be gained through such experience as the operation of military aircraft in the fighter, attack, or training roles, from flight test operations, and from aerobatic demonstrations or competition.

## **2) Normal Flight Operations**

Instructor experience with routine flight operations to include Transport Category aircraft used in corporate or commercial flight operations provides the ability to understand limitations of conventionally certified aircraft and to appreciate the operational context in which most unanticipated airplane upsets occur. This experience can be helpful in providing the essential transfer of concepts from a training aircraft employed in UPRT and other aircraft types.

## **3) Instructional Background**

Instructional experience provides the ability to accurately deliver the training curriculum employing sound instructional techniques. It helps in understanding the importance of adhering to the UPRT scenarios that have been validated by the training program developer. Instructional experience provides the expertise to accurately assess trainee's performance levels and provide effective remediation.

Possession of a CFI rating, Master CFI, or Master CFI -Aerobatic designation, though not required, can provide a measure of instructional experience, as can the number of hours of instruction given in flight. Background education in a technical field can prove beneficial in addressing certain technical aspects of UPRT.

Standardization and currency in UPRT delivery can become issues for consideration for Training Organizations with multiple UPRT instructors.

### **UPRT Instructors for FSTD delivery**

Although the implications for safety are dramatically different for delivering UPRT in a FSTD versus an actual aircraft, the potential for the delivery of negative training is just as great. For that reason, instructors delivering UPRT in an FSTD benefit from the areas of expertise outlined above for the same reasons. Additionally, a UPRT FSTD instructor should:

- a) understand the capabilities and limitations of the specific FSTDs used for UPRT
- b) understanding the valid training envelope (VTE) of the device in use and the appreciation for the potential of negative training that may exist when training beyond the boundaries of this VTE
- c) understand specific UPRT-related functionality of the Instructor Operating Station (IOS)
- d) distinguishing between generic UPRT strategies and OEM specific recommendations with respect to their relevance to the device capabilities and limitations; and
- e) understand the importance of adhering to the UPRT scenarios that have been validated by the training program developer.