B. Upset Prevention and Recovery Training (UPRT) Maneuver Evaluation (Table A1A, Section 2.n.)

1. Applicability: This attachment applies to all simulators that are used to satisfy training requirements for upset prevention and recovery training (UPRT) maneuvers. For the purposes of this attachment (as defined in the Airplane Upset Recovery Training Aid), an aircraft upset is generally defined as an airplane unintentionally exceeding the following parameters normally experienced in line operations or training:

a. Pitch attitude greater than 25 degrees nose up;
b. Pitch attitude greater than 10 degrees nose down;
c. Bank angles greater than 45 degrees; and
d. Within the above parameters, but flying at airspeeds inappropriate for the conditions.

FSTDs that will be used to conduct training maneuvers where the FSTD is either repositioned into an aircraft upset condition or an artificial stimulus (such as weather phenomena or system failures) is applied that is intended to result in a flightcrew entering an aircraft upset condition must be evaluated and qualified in accordance with this section.

2. General Requirements: The general requirement for UPRT qualification in Table A1A defines three basic elements required for qualifying an FSTD for UPRT maneuvers:

a. FSTD Training Envelope: Valid UPRT should be conducted within the high and moderate confidence regions of the FSTD validation envelope as defined in paragraph 3 below.
b. Instructor Feedback: Provides the instructor/evaluator with a minimum set of feedback tools to properly evaluate the trainee's performance in accomplishing an upset recovery training task.
c. Upset Scenarios: Where dynamic upset scenarios or aircraft system malfunctions are used to stimulate the FSTD into an aircraft upset condition, specific guidance must be available to the instructor on the IOS that describes how the upset scenario is driven along with any malfunction or degradation in FSTD functionality that is required to stimulate the upset.

3. FSTD Validation Envelope: For the purposes of this attachment, the term ''flight envelope'' refers to the entire domain in which the FSTD is capable of being flown with a degree of confidence that the FSTD responds similarly to the airplane. This envelope can be further divided into three subdivisions (see Appendix 3–D of the *Airplane Upset Recovery Training Aid*):

a. Flight test validated region: This is the region of the flight envelope which has been validated with flight test data, typically by comparing the performance of the FSTD against the flight test data through tests incorporated in the QTG and other flight test data utilized to further extend the model beyond the minimum requirements. Within this region, there is high confidence that the simulator responds similarly to the aircraft. Note that this region is not strictly limited to what has been tested in the QTG; as long as the aerodynamics mathematical model has been conformed to the flight test results, that portion of the mathematical model can be considered to be within the flight test validated region.
b. Wind tunnel and/or analytical region: This is the region of the flight envelope for which the FSTD has not been compared to flight test data, but for which there has been wind tunnel testing or the use of other reliable predictive methods (typically by the aircraft manufacturer) to define the aerodynamic model. Any extensions to the aerodynamic model that have been evaluated in accordance with the definition of an exemplar stall model (as described in the stall maneuver evaluation section) must be clearly indicated. Within this region, there is moderate confidence that the simulator will respond similarly to the aircraft.
c. Extrapolated: This is the region extrapolated beyond the flight test validated and wind tunnel/analytical regions. The extrapolation may be a linear extrapolation, a holding of the last value before the extrapolation began, or some other set of values. Whether this extrapolated data is provided by the aircraft or simulator manufacturer, it is a ''best guess'' only. Within this region, there is low confidence that the simulator will respond similarly to the aircraft. Brief excursions into this region may still retain a moderate confidence level in FSTD fidelity; however, the instructor should be aware that the FSTD's response may deviate from the actual aircraft.

4. Instructor Feedback Mechanism: For the instructor/evaluator to provide feedback to the student during UPRT maneuver training, additional information must be accessible that indicates the fidelity of the simulation, the magnitude of trainee's flight control inputs, and aircraft operational limits that could potentially affect the successful completion of the maneuver(s). At a minimum, the following must be available to the instructor/evaluator:

a. FSTD Validation Envelope: The FSTD must employ a method to display the FSTD's expected fidelity with respect to the FSTD validation envelope. This may be displayed as an angle of attack vs sideslip (alpha/beta) envelope cross-plot on the Instructor Operating System (IOS) or other alternate method to clearly convey the