

ATTACHMENT J
FAA Correspondence
(22 pages)

American Airlines®

July 27, 1995

Mr. D. F. Bitonti
Principal Operations Inspector, AAL
FEDERAL AVIATION ADMINISTRATION
DFW Flight Standards District Office
DFW Business Center, South Tower, Suite 400
P. O. Box 619020
Dallas/Fort Worth Airport, Texas 75261

Subject: APPROVED TRAINING MANUAL (Selected Event Training)

Dear Mr. Bitonti:

The attached revision to our Approved Training Manual is submitted for your approval.

Based on recent NTSB concerns and recommendations for operators to provide flight crewmembers with flight training in hazardous inflight situations, we are taking the initiative to conduct this type training during simulator flight training periods. This type training has been referred to as "Selected Event Training".

FAA order 8400.10 encourages operators to provide training on new or revised maneuvers or procedures, new equipment, or other similar areas during periods of Recurrent Flight Training (RFT). With regard to training under our approved Single Visit Training (SVT) exemption plan, we have been afforded regulatory flexibility to conduct "Selected Event Training" as "variable maneuvers" which are determined by the fleet manager and identified in writing to the APM.

AAL is currently training pilots in certain hazardous inflight situation events during Initial, Transition, and Upgrade simulator training sessions which, over the years, have been recommended by ACOBs, FSAT and HBAT bulletins. Examples are high altitude maneuvers (stalls and recovery), engine failure after take-off in the climb segment, etc.

We plan to include some additional "Selected Events" as optional maneuvers into our Initial, Transition, Upgrade and Recurrent SVT simulator training sessions as they apply to the particular aircraft type and within the specific simulator capability. With regard to SVT recurrent simulator sessions, these will be considered variable events. Some examples are as follows:

1. Engine failure during second segment of climb
2. False Stall Warning ("stick shaker") at rotation
3. Unusual attitude/recovery:
 - Excessive roll attitudes (90 degrees plus)
 - High pitch attitudes (35 degrees plus)
4. High Altitude Maneuvers (Upsets, Approach to Stalls etc.)
5. Single eng. minimum control speed (on autopilot)
6. Single-eng. autopilot ILS approach & missed approach
7. Other events, as applicable to A/C type

We plan to accomplish at least two selected events in each recurrent training session.

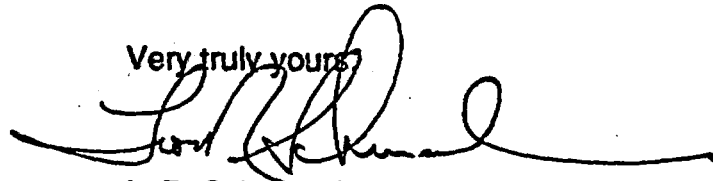
Page 2, ATM, (Selected Event Training)

We believe this voluntary initiative will enhance pilot skill as it relates to the concerns expressed by the NTSB regarding the need for pilots to be trained to handle hazardous inflight situations that could be encountered during line operations.

The attached ATM revision adds some of the events to our flight training segment module tables in the Chapter 3.

We would appreciate your returning the signed letter and program originals and retaining the copies for your files.

Very truly yours,



L. R. Schumacher
Managing Director
Flight Training/Standards

Enclosures

Approved/Disapproved

Name: D. J. Stout
Title: Principal Opns. Inspector, AAL
Date: AUG 01 1995



AMERICAN AIRLINES

APPROVED TRAINING MANUAL REVISION No. 31

8-22-95

HIGHLIGHTS

This revision adds "Selected Events", hazardous inflight situations, to the Initial, Transition, Upgrade, and Recurrent SVT simulator training sessions as recommended by the NTSB and encouraged by FAA.

FILING INSTRUCTIONS

Add, Remove or Replace any like page(s) in your ATM as indicated below. Enter the date the revision is inserted on the Revision Record.

<u>CHAPTER</u>	<u>SECTION</u>	<u>PAGE(s)</u>	<u>DATE</u>
	Page Control	1 & 3	8-22-95
3.....	4	3.4.1.....	8-01-95
3.....	4	3.4.4.....	8-01-95
3.....	4	3.4.5.....	8-01-95 (New)
3.....	5	3.5.1.....	8-01-95
3.....	5	3.5.4.....	8-01-95
3.....	5	3.5.5.....	8-01-95 (New)
3.....	6	3.6.2.....	8-01-95
3.....	6	3.6.4.....	8-01-95
3.....	6	3.6.5.....	8-01-95 (New)

NOTE: The effective page dates are the Approval Dates by FAA at the bottom of each ATM page except for the Page Control and "Letters T/C" section.



U.S. Department
of Transportation
Federal Aviation
Administration

AUG 18 1995

Flight Standards District Office
P. O. Box 619020
Dallas-Fort Worth Airport, TX 75261
214-574-2150

August 17, 1995

Captain C. D. Ewell
Vice President, Flight & Chief Pilot
American Airlines, Inc.
P. O. Box 619617, M/D 851, GSWFA
DFW Airport, Texas 75261-9617

Dear Captain Ewell:

This is in reference to Captain Schumacher's letter of July 27, 1995, concerning American Airlines Approved Training Manual (ATM), Chapter 3, Section 4, pages 3.4.1, 3.4.4, and 3.4.5; Section 5, pages 3.5.1, 3.5.4, and 3.5.5; Section 6, pages 3.6.2, 3.6.4 and 3.6.5 dated, July 26, 1995. This revision will add "Selected Events", hazardous inflight situations, to the Initial, Transition, Upgrade, and Recurrent SVT simulator training sessions. Your request for curriculum approval is granted initial approval effective August 01, 1995. The expiration date of this initial approval is August 01, 1997.

This office requests American Airlines provide at least 30 days advance notice of any training to be conducted under this curriculum to allow for evaluation of the training in accordance with FAR 121.405 (b) and (c).

Sincerely,

D. F. Bitonti
Principal Operations Inspector, AAL

Enclosure
ATM Rev



Approved Training Manual

Chapter 3 FLIGHT TRAINING SEGMENT

Section 4 PIC/SIC INITIAL NEW-HIRE, INITIAL & SIC UPGRADE FLIGHT TRAINING (Cont)

CODE:

- x=Device/Sim or higher qualifies for event
- A=Lower Device Sim may be used if specifically approved for event
- []=If required/Authorized by ops specs
- #=Optional, not specifically required by FAR or ops specs

	Level of Ft Trng Device				Level of Ft Sim				Act
	4	5	6	7	A	B	C	D	
			ATD		VIS	PH 1	PH 2	PH 3	
J. FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE:									
-Holding			X						
-Ice Accumulation on Airframe #				X					
-Air Hazard Avoidance #					A		X		
-TCAS Maneuver Trng: (Approved CBI may be used) (PIC/SIC Initial & Upgrade & System Differences)	A								
K. #SELECTED EVENT TRAINING (Hazardous inflight situations) (As applicable to A/C type)									
-Eng Failure During 2nd Climb Segment (After T.O.) (ACOB)					X				
-False Stall Warning ("stick shaker") at rotation									
-Unusual attitude/recovery:									
-Excessive roll attitudes (90 degrees plus)									
-High pitch attitudes (35 degrees plus)									
-High Altitude Maneuvers (Upsets, Approach to Stalls etc.)									
-Single eng. minimum control speed (on autopilot)									
-Single-eng. autopilot ILS approach & missed approach									
-Other events, as applicable to A/C type									
L. SYSTEMS PROCEDURES DURING ANY PHASE: (NORMAL/ABNORMAL/ALTERNATE)									
-Pneumatic/Pressurization									
-Air Conditioning									
-Fuel and Oil									
-Electrical									
-Hydraulic	A		X						
-Flight Controls									
-Airborne Weather Radar									
-Communications Equipment									
-Navigation Systems									
-Anti-Icing and Deicing Systems			X						
-Autopilot									
-Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X						
-Flight Instrument System Malfunction									

Approved by: *D. J. [Signature]*
 AA Principal Inspector
 Initial Approval Date: AUG 0 1 1995
 Expiration Date: AUG 0 1 1997

Approved by: _____
 AA Principal Inspector
 Final Approval Date: _____



Approved Training Manual

Chapter 3 FLIGHT TRAINING SEGMENT

Section 5 PIC/SIC TT & UU-1 FLIGHT TRAINING EVENT OUTLINE (Cont)

CODE:

- x=Device/Sim or higher qualifies for event
- A=Lower Device Sim may be used if specifically approved for event
- []=If required/Authorized by ops specs
- #=Optional, not specifically required by FAR or ops specs

	Level of Ft Trng Device				Level of Ft Sim				Actf
	4	5	6	7	A	B	C	D	
			ATD		VIS	PH 1	PH 2	PH 3	
J. FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE:									
-Holding			X						
-Ice Accumulation on Airframe #				X					
-Air Hazard Avoidance #					A		X		
-TCAS Maneuver Trng: (Approved CBI may be used) (PIC/SIC Initial & Upgrade & System Differences)	A								
K. #SELECTED EVENT TRAINING (Hazardous Inflight situations) (As applicable to A/C type)									
-Eng Failure During 2nd Climb Segment (After T.O.) (ACOB)					X				
-False Stall Warning ("stick shaker") at rotation					X				
-Unusual attitude/recovery:									
--Excessive roll attitudes (90 degrees plus)									
--High pitch attitudes (35 degrees plus)									
-High Altitude Maneuvers (Upsets, Approach to Stalls etc.)									
-Single eng. minimum control speed (on autopilot)									
-Single-eng. autopilot ILS approach & missed approach									
-Other events, as applicable to A/C type									
L. SYSTEMS PROCEDURES DURING ANY PHASE: (NORMAL/ABNORMAL/ALTERNATE)									
-Pneumatic/Pressurization									
-Air Conditioning									
-Fuel and Oil	A		X						
-Electrical									
-Hydraulic									
-Flight Controls									
-Airborne Weather Radar									
-Communications Equipment									
-Navigation Systems									
-Anti-icing and Deicing Systems			X						
-Autopilot									
-Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X						
-Flight Instrument System Malfunction									

Approved by: *D. J. [Signature]*
 AA Principal Inspector
 Initial Approval Date: AUG 0 1 1995
 Expiration Date: AUG 0 1 1997

Approved by: _____
 AA Principal Inspector
 Final Approval Date: _____



Approved Training Manual

Chapter 3 FLIGHT TRAINING SEGMENT

Section 6 (Cont) PIC/SIC RECURRENT FLIGHT TRAINING(RFT) & PROFICIENCY CHECK EVENT OUTLINE

CODE:

- x=Device/Sim or higher qualifies for event for Recurrent Training
- A=Lower Device Sim may be used if specifically approved for event
- []=If required/Authorized by ops specs
- #=Optional, not specifically required by FAR or ops specs
- C=Procedures only
- W=Waivable for Proficiency check
- C-A-P Applies to Prof CK during Int, Trans, U/G, & Requal

	Level of Ft Trng Device				Level of Ft Sim				Actf
	4	5	6	7	A	B	C	D	
I. AFTER LANDING: -Parking #					X				
-Emergency Evacuation #			X						
J. FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE: -W Holding (May combine with Area Dept & Arrival)			X						
-Ice Accumulation on Airframe #				X					
-Air Hazard Avoidance #					A	X			
-Windshear/Microburst (At least one event, T.O. or Approach)					X				
-TCAS Maneuver Trng: (Approved CBI may be used) (PIC/SIC Initial & Upgrade & System Differences)	A								
K. #SELECTED EVENT TRAINING (Hazardous Inflight situations) (At least two (2) as applicable to A/C type) -Eng Failure During 2nd Climb Segment (After T.O.) (ACOB) -False Stall Warning ("stick shaker") at rotation -Unusual attitude/recovery: -Excessive roll attitudes (90 degrees plus) -High pitch attitudes (35 degrees plus) -High Altitude Maneuvers (Upsets, Approach to Stalls etc.) -Single eng. minimum control speed (on autopilot) -Single-eng. autopilot ILS approach & missed approach -Other events, as applicable to A/C type					X				
L. SYSTEMS PROCEDURES DURING ANY PHASE: (NORMAL/ABNORMAL/ALTERNATE) -Pneumatic/Pressurization -Air Conditioning -Fuel and Oil -Electrical -Hydraulic -Flight Controls -Airborne Weather Radar -Communications Equipment -Navigation Systems	A		X						
-Anti-icing and Deicing Systems			X						
-Autopilot -Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids -Flight Instrument System Malfunction		A	X						

Approved by: *D.P. Delont*
 AA Principal Inspector
 Initial Approval Date: AUG 01 1995
 Expiration Date: AUG 01 1997

Approved by: _____
 AA Principal Inspector
 Final Approval Date: _____

**NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF AVIATION SAFETY**

SUBJECT: Accident/Incident Investigation Support Request
TO: Manager, Recommendation and Quality Assurance Division, AAI-200
FROM: NTSB, AS-30 and RE-60 NTSB Log Number: 02-039
DATE: April 23, 2002

DETAILED DESCRIPTION OF SUPPORT REQUESTED

We are requesting information regarding the certification of simulators and their use in airline training programs. Specifically, we are interested in the following:

1. The process by which the FAA approves simulations for flight crew training purposes and the tests by which the simulations are shown to be representative of the real airplane. Does the simulator certification place limits on the range of flight conditions for which the simulation is valid? For example, does the certification criteria specify limits on angle of attack, sideslip angle, angular rates, or other parameters beyond which the simulation is not certified to represent the real airplane?
2. Does the FAA review airline training programs to ensure simulator training respects the limits of simulation? If not, why not? What is the frequency of such reviews? When was the last review of the American Airlines A300 simulator and associated training program? What were the findings?
3. Does the American Airlines Advanced Maneuver Program that incorporates simulator demonstrations of unusual flight attitudes (extreme pitch and roll angles) stay within the simulator limitations as outlined in (1.) above? How is this verified?

NTSB POINT OF CONTACT/TELEPHONE:

David J. Ivey, AS-30 (202) 314-6335
John O'Callaghan, RE-60 (202) 314-6560

A. Rowlett

Memorandum

Us. Department
of Transportation
Federal Aviation
Administration

Subject **INFORMATION:** NTSB Accident/Incident
Request 02-029; AAI-220 route slip dated April 23, 2002

Reply to Wanda Moore
Attn. of: 202/267-7220
FAX:

202/267-7636

From: Director, Flight Standards Service, AFS-1

To: Director of Accident Investigation, AAI-1
ATTN: Kim Burtch, AAI-220

This memorandum is in response to the subject request from NTSB regarding the certification of simulators and their use in airline training programs. Specifically, the NTSB requested the following information:

Question 1. The process by which the FAA approves simulations for flight crew training purposes and the tests by which the simulations are shown to be representative of the real airplane. Does the simulator certification place limits on the range of flight conditions for which the simulation is valid? For example, does the certification criteria specify limits on angle of attack, sideslip angle, angular rates, or other parameters beyond which the simulation is not certified to represent the real airplane?

AFS Response: The National Simulator Program (NSP) qualification of a simulator does not place limits on the aerodynamic parameters beyond which the simulator is not qualified to represent the real aircraft. Qualification is based on adequate presentation of results that meet the requirements of the applicable advisory circular (AC). The simulator is qualified to the minimum requirements of that AC. Primarily, historic aircrew training needs have dictated the requirements in the AC.

Several AC's are used in simulator qualification. These include AC 121-14 as amended through Revision "C" and AC 120-40 as amended through draft Revision "C." Under a grandfather provision, a simulator remains subject to the requirements of the AC under which it was initially qualified regardless of publication of updates to the AC or publication of a new AC. The process that the FAA uses to evaluate and qualify the airplane flight simulators used in training programs or airman checking under 14 CFR is described in detail in the applicable AC. Regardless of the AC involved, there are two basic phases to the process, an objective evaluation and a subjective evaluation.

During an objective evaluation, all flight simulators are required to perform and respond in the same manner as the aircraft being simulated within certain specific performance tolerances. The simulator performance and/or responses are compared to the real aircraft through a comparison of simulator test data to aircraft flight test data. Each test performed is referred to as a "test case." The test cases found in the AC are standalone tests that can be replicated in a flight simulator because they have first been accomplished in the actual aircraft in flight. Normally, the flight test data are gathered during the aircraft certification process; however, sometimes they are obtained after the certification flight test program is complete. In either case, the flight test data are obtained in accordance with established engineering flight test procedures. The data that are reduced from these actual flight test cases are the data to which the simulator performance must be matched within the published tolerances. Each flight test case, and each comparable simulator test case, is complete from beginning to end and usually independent from other test cases. Each case is designed to exhibit specific performance or stability characteristics.

Prior to a new simulator receiving an evaluation for possible qualification, the simulator sponsor is required to submit a Qualification Test Guide (QTG) to the FAA. The QTG contains objective test results for each test case required for that simulator for its level of qualification. Also included in the QTG is reference data for each test case that are a duplication of the actual aircraft flight test data for that test case. Each test case has specific initial conditions for the aircraft, the environment, etc., that are replicated for the simulator test case.

As an example, a simulator qualified at the highest level (Level D) under AC 120-40B, Airplane Simulator Qualification (copy attached), has to replicate the actual aircraft performance for the "Critical Engine Failure on Takeoff" maneuver. Reference to AC 120-40B, Appendix 2, Item b5, will show that for this objective test the simulator must "...Record takeoff profile at maximum takeoff weight to at least 200 ft. AGL. Engine failure speed must be within 3 Kts. of airplane data." The parameters that must be matched by the simulator and the specific tolerances allowed for this maneuver are:

Airspeed	+3 Knots
Pitch	+1.5 Degrees
Angle of Attack	+1.5 Degrees
Altitude	+20 Feet
Bank Angle	+2 Degrees
Sideslip Angle	+2 Degrees

It is important to recognize that the comparison of performance and application of tolerances is only valid for the specific test conditions that existed or were demonstrated during the aircraft "critical engine inoperative failure on takeoff" flight test data acquisition phase and by no means does it demonstrate critical limits of the airplane characteristics.

AC 120-40B includes a list of objective tests assessed during the simulator evaluation/qualification process, each with its own specific requirements and tolerances. This list, however, is not exhaustive and is only meant to represent the best practical reference set to demonstrate airplane replication.

In addition to flight test maneuver objective tests, this portion of the evaluation/qualification process includes objective testing of the simulator motion, sound, and visual systems.

The handling qualities, performance, and simulator system operation are subjectively assessed during the simulator evaluation/qualification process. AC 120-40B also contains an extensive list of subjective tests and functions that is analyzed. The simulator is subjectively compared to the aircraft in a much broader operational envelope that more closely represents normal flight operations. There is some limited objectivity in this phase in regard to simulator systems responding to switches, etc., in the same way that the aircraft systems would respond. The subjective test is conducted by a member of the NSP.

Another important aspect of flight simulation concerns simulation or modeling of the aerodynamic environment in which the simulated airplane operates. Standard modeling methods are used followed by "tuning" of the model. The modeling process uses available aircraft data, and the intent of tuning is to produce results as close as possible to the actual airplane. The accuracy of the aerodynamic model is dependent upon the availability of accurate airplane data. This process may include a significant amount of interpolation based on sound established engineering principles. The interpolation is necessary because the simulated environment must replicate the infinite real environment.

Question 2. Does the FAA review airline training programs to ensure simulator training respects the limits of simulation? If not, why not? What is the frequency of such reviews? When was the last review of the American Airlines A300 simulator and associated training program? What were the findings?

AFS Response. The individual airline's principal operations inspector (POI) is responsible for the review and approval of an airline's training program. The NSP, on the other hand, is responsible to ensure that a simulator is properly programmed to replicate the respective airplane for use in training programs approved by POI. As stated above, this NSP qualification is based on adequate presentation of results that meet specific flight test maneuver requirements of the applicable AC.

The NSP does conduct annual recurrent evaluations of simulators in accordance with the requirements of the applicable AC. These evaluations are best described as an abbreviated version of the initial evaluation described in the

response to Question 1. The American Airlines (AMR) A300 simulator received its last recurrent evaluation by the NSP on September 7, 2001.

AMR also performs secondary evaluations six months out of phase with the NSP evaluation cycle. The Certificate Management Office (CMO) Aircrew Program Managers (APM) regularly attend the evaluation sessions on the simulators utilized by their respective fleets, regardless of who is conducting the evaluation. The A300 simulator received a secondary evaluation from AMR, which was attended by the A300 APM, on January 9, 2002. The following were the findings:

- Test Number 182: Turning Seat Belt light off does not give tone.
- Test Number 247: RWY JFK 31R has red flashing light (Appx. 1000-2000') down runway
- Test Number 249: PAPI missing on numerous runways at ORD.
- Test Number 249: KMIA 09R VASI lights should be PAPIs.

The last review of the AMR A300 simulator and associated training program was conducted in March 2002. The POI and the A300 APM reviewed the Advanced Aircraft Maneuvers Program (AAMP) ground and simulator portions. The training observed matched the program descriptions in the approved training program curriculum segments.

The APM's from the AMR CMO conduct continuous reviews of their respective training programs by virtue of accomplishment of their day-to-day certification and surveillance activities of the airmen and components of their respective fleet's training program.

Additionally, a team from AFS-200 conducted a special review of AMR's A300 and AAMP training programs during March 2002.

Question 3. Does the American Airlines Advanced Maneuver Program that incorporates simulator demonstrations of unusual flight attitudes (extreme pitch and roll angles) stay within the simulator limitations as outlined in (1.) above?

AFS Response. The POI has no guidance outlining the theoretical limits of simulation. The POI relies principally on the National Simulator Program Manager's (NSPM) recommendations for maneuvers that replicate the actual aircraft response for inclusion into the carrier's approved training program.

Based in part on accident investigation analysis, the NTSB has historically recommended to the FAA to require certain additional training (beyond the regulatory requirements of 14 CFR part 121) in FAA-approved air carrier training programs.

In direct response to these recommendations by the NTSB regarding flightcrew training, on August 16, 1995, the FAA published Flight Standards Handbook Bulletin for Air Transportation (HBAT) 95-10, "Selected Event Training" (copy attached). The bulletin stressed, among other things, the importance of training regarding recovery from unusual attitudes. The FAA believed, however, that the most valuable training would not necessarily be limited to unusual attitude recovery but would also address recognition and containment of situations that could lead to unusual attitudes. The FAA further responded with programs that trained flightcrews on windshear, turbulence upsets, and wake turbulence encounters. The training was generally referred to as Selected Event Training (SET).

As a result, AMR initiated a SET module (upset training), identified as the American Airlines Advanced Maneuver Program (AAMP), as an integral part of initial, recurrent, transition, and upgrade training.

The direction contained in the "Action" statement of HBAT 95-10 was employed by the AMR CMO to encourage AMR to review its simulator capabilities to ensure that the visual, motion, instrument, and aerodynamic performance of each simulator accurately supported the inclusion of selected maneuvers not required by FAR part 121, i.e., the AAMP. AMR submits that the simulator performance is a predictable and defensible function of the equations of motion, including stability derivatives, which reliably portray simulator response throughout the spectrum of the aircraft's operating envelope - not just within the confines of the validation flight test data package. Although there may be a misunderstanding of the limitations of simulation validity, the AAMP training implemented by AMR provided a previously unattainable dimension of safety long sought after by the NTSB.

The maneuvers described as unusual flight attitudes (extreme pitch and roll angles) are not contained in the AC's for simulator qualification and the aircraft manufacturer provides no flight test data for these maneuvers. Without flight test data to validate a maneuver, the NSP is not able to assure that the simulator is properly programmed to replicate the respective airplane throughout these maneuvers. Regardless, SET training is not a requirement for pilot aircraft qualification and certification. It is additional training, long sought by the NTSB, with the objectives of pilot early recognition and proper control inputs for avoidance and for effective recovery. The emphasis is on recognition and procedures. Precise simulator response fidelity is not required to accomplish this training. A lower performance level flight training device would be equally adequate for SET training. The use of any training device for procedural instruction is of significant value in preparing flightcrews for events they can never train for in actual aircraft.

In accordance with the policy stated in HBAT 95-10, each operator has the responsibility to review their simulator capabilities to ensure that simulators used for selected event maneuvers training have the ability to accurately support the inclusion of those maneuvers in an approved training program. This review should include coordination in obtaining appropriate data and support from the aircraft manufacturer.

James J. Ballough

Attachments

AMR CMO ORG STRUCTURE/STAFFING

November 26, 2001



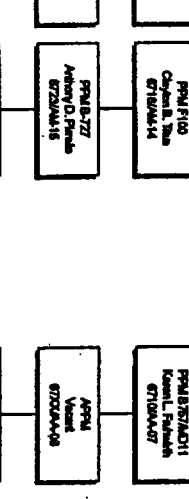
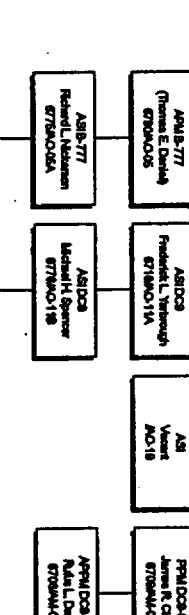
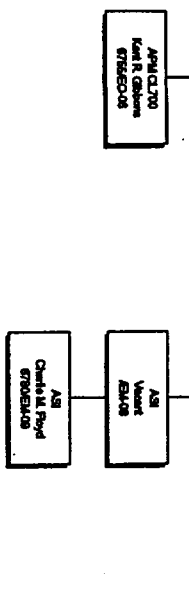
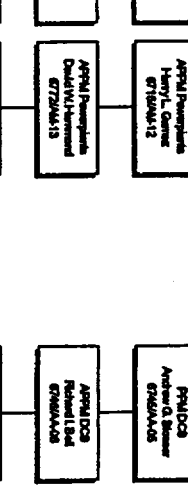
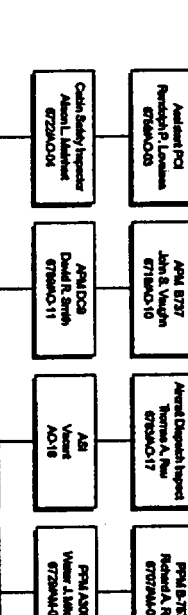
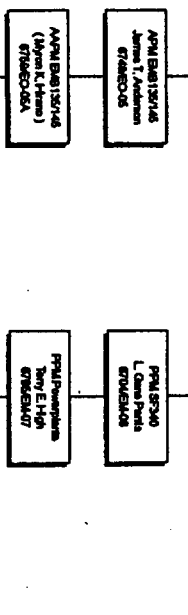
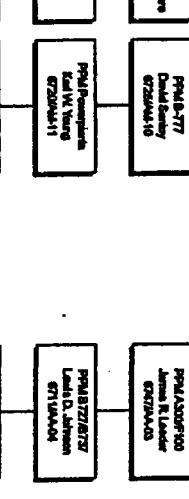
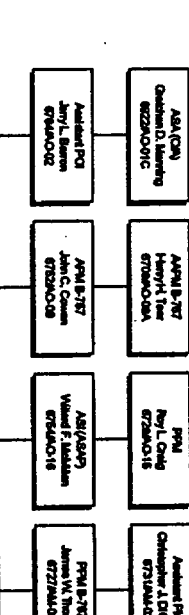
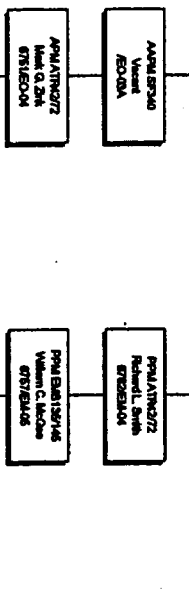
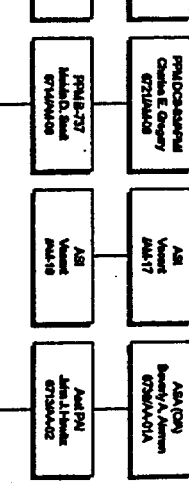
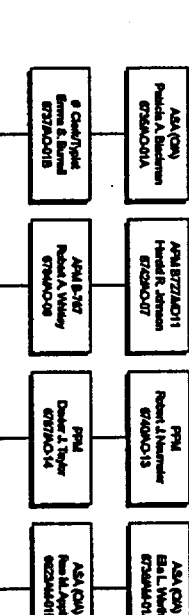
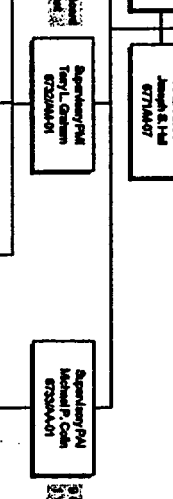
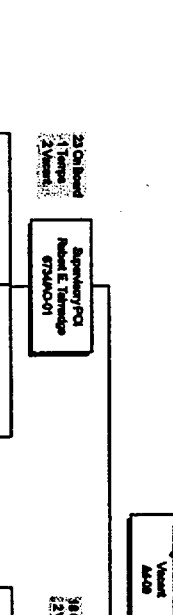
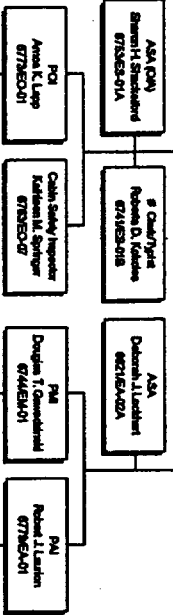
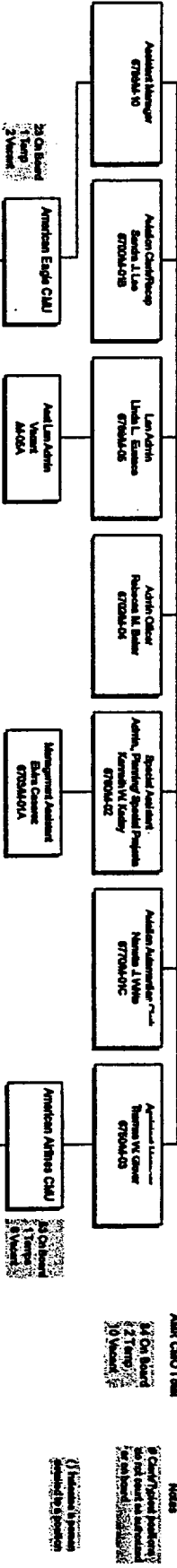
AMR CMO Team

Notes

1) 21 On Board
1 Temp
2 Vacant

2) 21 On Board
2 Temp
10 Vacant

3) 21 On Board
2 Temp
10 Vacant



ORDER: 8400.10

APPENDIX: 3

BULLETIN TYPE: Flight Standards Handbook Bulletin (HBB) for
Air Transportation (HBAT)

BULLETIN NUMBER: HBAT 95-10

BULLETIN TITLE: Selected Event Training

EFFECTIVE DATE: 8/16/95

TRACKING NUMBER: N/A

1. **SUBJECT.** This handbook bulletin contains guidance and information on the approval and implementation of "Selected Event Training" for operators, training under Federal Aviation Regulations (FAR) Part 121 rules, who use flight simulation devices as part of their flight training programs.

2. **DEFINITION:** Selected Event Training is voluntary flight training in hazardous inflight situations which are not specifically identified in FAA regulations or directives.

A. Some examples of Selected Event Training are false stall warning (stick shaker) at rotation; full stalls; excessive roll attitudes (in excess of 90 degrees); high pitch attitudes (in excess of 35 degrees); engine failure at low altitude and airspeed, after takeoff or during go-around engine-out minimum control speed on autopilot; and engine-out ILS to a missed approach with the autopilot engaged throughout.

NOTE: The above examples of Selected Event Training are examples only, and are not all-inclusive or mandatory. Because of the broad range of operations and equipment in use in the air transportation industry, the situations and countermeasures that may be trained as "Selected Events" may vary from operator to operator.

3. **BACKGROUND.** The FAA and industry have acknowledged National Transportation Safety Board (NTSB) recommendations regarding training in recovery from unusual attitudes. In addressing the NTSB's concerns, a consensus has been reached that the most valuable training would not necessarily be limited to unusual attitude recovery, but would also address recognition and containment of situations that might lead to unusual attitudes. Hence, the term Selected Event Training has been chosen as a broader term than "training in recovery from unusual attitudes." Certain air carrier training initiatives have already been undertaken that propose more flexibility in conducting recurrent flight training (RFT) while using flight simulation training devices. Those initiatives include Selected Event Training that meets the intent of the FAR. Many operators with an approved FAR Part 121 training program conduct "training in lieu of" a proficiency check as provided by FAR Section 121.409. This regulation provides operators the option to conduct that training according to the requirements of FAR

Part 121, Appendix F, or to provide line-oriented flight training (LOFT). Approved Selected Event Training is appropriate as part of LOFT. Training in new or revised procedures, in new equipment, or in any other relevant new material may also be appropriate during LOFT periods associated with RFT or Level A RFT.

A. FAR Section 121.409 requires that when using an aircraft simulator to conduct a course of training the training must:

(1) be at least four hours in length. This means four hours of total crewmember training activity to include approximately equal time for each pilot at the controls and appropriate briefings and debriefings.

(2) include at least the procedures and maneuvers set forth in Appendix F.

"OR"

(1) Provide "line-oriented flight training" that utilizes a complete flight crew.

(2) Include normal, abnormal, and emergency procedures that may be expected in line operations.

(3) be representative of a flight segment appropriate for the operator.

B. These latter three provisions of FAR Section 121.409 provide the regulatory flexibility for an operator to substitute training in selected events for training in Appendix F maneuvers/procedures. For example, an operator conducting LOFT under FAR Section 121.409 might substitute an engine failure at 800 feet AGL for a V1 cut.

C. An operator conducting training under an Advanced Qualification Program (AQP) or under a Single Visit Training (SVT) Exemption is afforded the same flexibility as a conventional operator to include Selected Event Training. An AQP operator might identify and train certain Selected Events through the AQP task analysis methodology. An SVT operator might include Selected Event Training as part of the "special emphasis maneuvers" listed in its individual curriculum.

4. ACTION. POI's should encourage their operators to review their simulator capabilities to ensure that the visual, motion, instrument and aerodynamic performance of each simulator accurately supports the inclusion of selected maneuvers not required by FAR Part 121, Appendix F; and to consider including in Recurrent Flight Training curriculum segments appropriate Selected Event Training. That training should address in flight hazards that might be encountered in the specific operator's line operations. Operators should submit any Selected Event Training proposals to their POI's for inclusion in their approved training programs.

5. INQUIRIES. The originator of this bulletin is AFS-210. Any questions concerning this bulletin should be directed to AFS-210 at (202) 267-3718

6. LOCATION IN HANDBOOK. Inspectors should make a note of this bulletin in the margin of FAA Order 8400.10, Air Transportation Operations Inspector's Handbook, Volume 3, chapter 2, section 6.

7. EXPIRATION. This bulletin will remain in effect until further notice.

/s/

David R. Harrington

NOTICEU.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

N 8400.28

Date: 2/15/02

Cancellation

Date: 2/15/03

**SUBJ: TRANSPORT CATEGORY AIRPLANES – RUDDER AND VERTICAL STABILIZER
AWARENESS**

1. PURPOSE. This notice provides notification to Principal Operations Inspectors (POI) of air carriers that operate transport category airplanes regarding the operational use of rudder pedals and the potential subsequent effects on the vertical stabilizer. This notice is a response to National Transportation Safety Board (NTSB) recommendations A-02-01 and A-02-02.

2. DISTRIBUTION. This notice is distributed electronically to all Flight Standards District Offices. A paper copy of this notice will be sent to all Flight Standards Regional Offices for further distribution.

3. BACKGROUND. On November 12, 2001, American Airlines flight 587, an Airbus Industrie A300-600, crashed shortly after takeoff from John F. Kennedy International Airport (JFK). Before impact, the vertical stabilizer and rudder separated from the fuselage. The 2 pilots, 7 flight attendants, and 251 passengers on board, as well as 5 persons on the ground, were killed. Before separation of the vertical stabilizer and rudder, the A300 twice experienced turbulence consistent with encountering wake vortices from a Boeing 747 that had departed JFK just ahead of the A300. The 747 was 5 miles and 90 seconds ahead when the A300 encountered the vortices. During and shortly after the second vortex encounter, the flight data recorder (FDR) on the A300 recorded several large rudder movements (and corresponding pedal movements) to full or nearly full available rudder deflection in one direction followed by full or nearly full available rudder deflection in the opposite direction. The FDR did not record any reliable rudder position data after this, consistent with the vertical stabilizer separating from the airplane.

a. Among the potential causes being examined by manufacturers and operators are rudder system malfunction and flightcrew action. The NTSB has learned that sequential full opposite rudder inputs (sometimes referred to as "rudder reversals") – even at speeds below the design maneuvering speed – may result in structural loads that exceed those addressed by the requirements. In fact, pilots may have the impression that the rudder limiter systems installed on most transport category airplanes prevent sequential full opposite rudder deflections from damaging the structure. However, the structural certification requirements for transport category airplanes do not take such maneuvers into account; therefore, such sequential opposite rudder inputs, even when a rudder limiter is in effect, can produce loads higher than those required for certification and may exceed the structural capabilities of the aircraft.

b. The NTSB is also concerned that pilots may not be aware that, on some airplane types, full available rudder deflections can be achieved with small pedal movements and comparatively

light pedal forces. In these airplanes, at low speeds (for example, on the runway during the early takeoff run or during flight-control checks on the ground or simulator training) the rudder pedal forces required to obtain full available rudder may be three times greater than those required to obtain full available rudder at higher airspeeds.

c. Notwithstanding the concerns noted above about the potential danger of large and/or sequential rudder inputs in flight, it should be emphasized that pilots should not become reluctant to command full rudder when required and when appropriate, such as during an engine failure shortly after takeoff or during strong or gusty crosswind takeoffs or landings. The instruction of proper rudder use in such conditions should remain intact but should also emphasize the differences between aircraft motion resulting from a single, large rudder input and that resulting from a series of full or nearly full opposite rudder inputs.

4. ACTION.

a. POIs with oversight responsibility for air carriers that operate transport category airplanes should provide a copy of this notice to the air carrier so they are aware of the NTSB safety concerns.

b. **Program Tracking and Reporting Subsystem (PTRS).** This action must be documented using appropriate PTRS procedures for each training provider.

(1) Use the Technical Administration Direct Action Accomplishment code 1381.

(2) Enter ATSA00004 in the National Use field (no space, no punctuation).

(3) Once the above information has been provided to the air carrier, close out the PTRS.

c. **ATOS Reporting.** ATOS POIs will make an ATOS entry using the "Other Observation DOR" functionality to record the actions directed by this notice. The POI will access the "Create DOR" option on their ATOS Homepage, select the "Other Observation" tab, and:

(1) Select System: *4.0 Personnel Training and Qualifications*;

(2) Select Sub-system: *4.2 Training Program*;

(3) Select the appropriate air carrier from the drop-down menu;

(4) Enter the date the activity was started and completed;

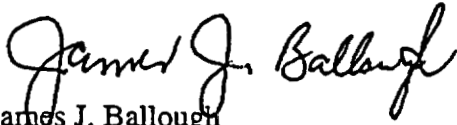
(5) Enter the location the activity was performed;

(6) Enter "ATSA00004" in the "Local/Regional/National Use" field;

(7) POIs should use the "Comments" field to record any comments reflecting interaction with an operator;

- (8) Input any actions taken in the "Reporting Inspector Action Taken" field; and
- (9) The POI shall select the "Save" button after all entries have been made.

5. INCLUSION IN ORDER 8400.10. During an upcoming handbook change cycle, the Air Transportation Division, AFS-200, will update appropriate chapters of Order 8400.10, Air Transportation Operations Inspector's Handbook to include this information.



James J. Ballough
Director, Flight Standards Service



U.S. Department
of Transportation
**Federal Aviation
Administration**

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February 19, 2002

Mr. Timothy J. Ahern
Vice President – Safety Security & Environmental
American Airlines, Inc.
P. O. Box 619616, MD 851, HDQ
DFW Airport, TX 75261-9616

Dear Mr. Ahern:

As you know, the National Transportation Safety Board (NTSB) has issued Safety Recommendations A-02-01 and A-02-02 in response to its on-going investigation of the American Airlines Flight 587 accident (copies enclosed for your convenience). In the recommendations, the NTSB recommends that the Federal Aviation Administration (FAA) accomplish the following:

Require the manufacturers and operators of transport-category airplanes to establish and implement pilot training programs that:

- (1) explain the structural certification requirements for the rudder and vertical stabilizer on transport-category airplanes
- (2) explain that a full or nearly full rudder deflection in one direction followed by a full or nearly full rudder deflection in the opposite direction, or certain combinations of sideslip angle and opposite rudder deflection can result in potentially dangerous loads on the vertical stabilizer, even at speeds below the design maneuvering speed;
- (3) explain that, on some aircraft, as speed increases, the maximum available rudder deflection can be obtained with comparatively light pedal forces and small pedal deflections.

The NTSB went on to recommend that the (FAA) should require revisions to airplane and pilot operating manuals that reflect and reinforce the aforementioned information.

In addition, the NTSB recommended that the FAA should ensure that this training does not compromise the substance or effectiveness of existing training regarding proper rudder use, such as during engine failure shortly after takeoff or during strong or gusty crosswind takeoffs or landings.

Lastly, the NTSB charged the FAA to carefully review all existing and proposed guidance and training provided to pilots of transport-category airplanes concerning special maneuvers intended to address unusual or emergency situations, and if necessary, require modification of the training programs to ensure that flight crews are not trained to use the rudder in a way that could result in dangerous combinations of sideslip angle and rudder position or other flight parameters.

As we have previously stated in our earlier letter regarding FAA Order 8400.28, also on this topic, we wish to discuss American Airlines' response to NTSB Safety Recommendations A-02-01 and A-02-02 during the previously requested meeting.

As previously stated, Ed Garrard is the project lead on this issue. Ed's telephone number is (972) 456-6724. If Ed or other personnel of the AMR Certificates Management Office (AMR CMO) may be of further assistance in this matter, please do not hesitate to contact us. We await your prompt response.

Sincerely,


Robert E. Talmadge
Principal Operations Inspector

Enclosures: N 8400.28

cc: Robert P. Kudwa