



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
National Policy

**NOTICE
N 8000.348**

Effective Date:
12/29/06
Cancellation Date:
12/29/07

SUBJ: Mitsubishi MU-2B Flight Standardization Board Report

- 1. PURPOSE.** This Notice details changes in training, checking, currency, and operational requirements for air carrier pilots operating the MU-2B airplane. We have made these changes as a result of the Mitsubishi Heavy Industries (MHI) Model MU-2B Flight Standardization Board (FSB).
- 2. DISTRIBUTION.** We will distribute this notice to the division level in the Flight Standards Service in Washington headquarters, including the Regulatory Standards Division at the Mike Monroney Aeronautical Center; to the branch level in the regional Flight Standards divisions; and to all Flight Standards District Offices. POIs can access this notice through the Flight Standards Information Management System (FSIMS) at <http://fsims.avr.faa.gov>. Operators may find this information on the Federal Aviation Administration's (FAA) Web site at: http://www.faa.gov/library/manuals/examiners_inspectors/8000/.
- 3. BACKGROUND.** The increasing number of accidents in recent years on MU-2B series airplanes prompted the FAA to conduct a thorough and complete safety evaluation. This evaluation involved a review of the type certification basis of the airplane, and a review of operations, maintenance, and training. The FAA used a data-driven approach to evaluate the design, operation, maintenance, and training of the MU-2B series airplanes to determine their current safety level and to define steps necessary for their safe operation. The safety evaluation also included convening a Flight Standardization Board, supported by the Kansas City AEG. The FSB evaluated the need for MU-2B specific pilot training and reviewed a MHI proposed flight training program.
- 4. FSB REPORT.**
 - a. Applicability.** In accordance with existing regulations, the provisions of the FSB report apply to all operations and all models of the MU-2B. The report is also applicable to all training and checking conducted in the airplane, as well as the currency and experience provisions. The report is effective until amended, superseded, or withdrawn by subsequent revision. Revision 1 is current. Additional revisions are expected to coincide with implementation of the MU-2B Special Federal Aviation Regulation (SFAR).
 - b. Determination of Type Rating or Additional Training.** The FAA has determined that the single standard of training must be a training program that the FSB finds effective and that the FAA has approved. The FSB requested and received a proposed MU-2B training program from MHI. The FSB modified the MHI Training Program throughout the FSB process so that at the conclusion of the Board process, the MHI Training Program complied with the FSB recommendations. The FAA granted initial approval of the MHI MU-2 Training Program (Part

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Initiated By: AFS-250

Number YET 05301) on July 27, 2006. As of September 19, 2006, Revision 1 of the training program is current.

c. Guidance for Incorporation of Training Program into Part 135 Programs.

(1) Operators must incorporate, by reference or other means, the approved MHI MU-2B Training Program (Part Number YET 05301) in its entirety into each operator's training program. Operators may also need to reference the training program in their General Operations Manual (GOM). The FAA will not allow any modifications to the training program without approval from the MU-2B FSB. We have reviewed the content of the training program and find it compliant with current guidance for make and model specific (MU-2B) ground and flight training. Principal Operations Inspectors (POIs) should give credit for training received under the MHI MU-2B Training Program to the extent that it also satisfies the training requirements found in Title 14 of the Code of Federal Regulations (14 CFR) part 135 for airplane-specific training.

(2) POIs should note that the MHI MU-2B Training Program does not address other make- and model-specific subject areas such as passenger briefings, flight following, maintenance away from home base, etc. Additionally, maneuvers covered under the final phase check required by the MHI Training Program may not satisfy all the requirements of a proficiency check under part 135, sections 135.293, 135.297, and 135.299. There are, however, many maneuvers required under the final phase check of the MHI Training Program that also appear on the FAA Form 8410-3, Airman Competency/Proficiency Check. In the event that these maneuvers or other training requirements appear in both training programs, give credit for the training under both programs. Document such actions carefully as this allowance does not eliminate any of the record keeping requirements within either training program. POIs must determine that operators meet all requirements of part 135. However, do not require operators to perform the maneuvers twice (i.e., once for the final Phase check and again during a proficiency/competency check administered in accordance with section 135.293).

(3) The FAA proposed making the MHI MU-2B training mandatory for all users of the MU-2B. The FAA reviewed the content of the MHI MU-2B Training Program and found the program compliant with the proposed MU-2B Special Federal Aviation Regulation (SFAR). The FAA will give credit for training conducted before the effective date of the proposed SFAR only if the operator conducts that training in accordance with and using the MHI MU-2B Training Program (Part Number YET 05301), and the training provider meets the experience requirements found within the proposed SFAR or as stated in the final rule.

(4) The proposed SFAR removes section 135.351(c), Substitution for Recurrent Flight Training. For initial/transition training curriculums, training and checking must be separate. For initial/transition training, completion of training program hours must be accomplished and endorsed by an authorized instructor before checking can begin. For recurrent and requalification training, checking events may be credited toward training program hours provided all training program tasks are accomplished and the minimum number of program training hours, as describe in the MHI MU-2B Training Program (Part Number YET 05301), are completed. No reduction in training hours is allowed. Training records must show satisfactory completion of each training program hour task in accordance with section 135.323(c). Part 135 specifies separate training and

checking for initial/transition/upgrade/differences training only, as per section 135.347 and section 135.293. A grace month is applicable to training and checking in accordance with section 135.323(b) and section 135.301(a). See FSB report paragraph 4.1.2, Course Completion Requirements.

d. Differences Between MHI Training and Part 135 Training. Resolve any differences that you note between the MHI training and part 135 training without changing or modifying the MHI Training Program. Operators should make any requests for changes in the MHI Training Program in writing and submit them to AFS-820.

e. Areas of Special Interest and Emphasis. The FSB has determined that the training and checking process for the MU-2B must emphasize and evaluate certain aspects of pilot knowledge, skills, and abilities, as follows:

- Accelerated stall awareness and training maneuvers with emphasis on configuration management; awareness of the margin to stall in all flight operations and configurations should be emphasized throughout training.
- Early recognition of minimum controllable airspeed with the critical engine inoperative (V_{mc}); emphasize minimum airspeeds for one engine inoperative in all configurations.
- Air speed management and recognition of airspeed deterioration below Airplane Flight Manual (AFM) recommended speeds and recovery methods throughout training and checking.
- Knowledge of icing conditions and encounters throughout training and checking, including equipment requirements, certification standards, minimum airspeeds, use of autopilot, and other AFM procedures. This information should conform to the standard of training set out by the Icing Training Video established by AD 2003-22-07 R1. This AD can be found at the following Web site: [http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/0/8c4dd2bcd844ac7386256e4b0056d36e/\\$FILE/032207R1.pdf](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/0/8c4dd2bcd844ac7386256e4b0056d36e/$FILE/032207R1.pdf)
- Knowledge of certification standards for airplane performance, both All Engine and One Engine Inoperative operations, as essential for decision-making regarding airplane operation.

f. Training Requirements.

(1) The MU-2B is a single pilot airplane. Do not give training credit for second-in-command training. Do not give training credit for training provided to a pilot receiving training while in the right seat of a MU-2B airplane, flight training device (FTD), or a simulator.

(a) Upgrade Training is not applicable.

(b) Initial/Transition Training: Applies to any pilot without documented MU-2B pilot operating experience, while serving as pilot-in-command, within the last two years.

(c) **Requalification Training:** Applies to any pilot with documented MU-2B pilot operating experience in the last two years, while serving as pilot-in-command, but who does not meet eligibility for Recurrent Training.

(d) **Recurrent Training:** Applies to any pilot who completed and documented training on an FSB compliant FAA Approved Training Program for the MU-2B in the last 12 months and is MU-2B current in accordance with this report. We consider training completed the month before or after the month due as completed in the due month.

(e) **Differences Training:** Applies to any pilot who operates more than one MU-2B model. Required Ground Training subjects are in accordance with differences between applicable models of the MU-2B to be operated.

(2) Ground training minimum program hours are as follows.

(a) Initial / Transition: 20 hours

(b) Requalification: 12 hours

(c) Recurrent: 8 hours

(d) Differences: Level B (FTD), initial only, 1.5 hours for each model at level B

Example: (Base + 1 model = 1.5) (Base + 3 models = 4.5)

(e) Level A differences do not require program hours. All recurrent differences are Level A.

(3) All MU-2B training programs must include instruction in the following:

- All applicable airplane systems modules by ATA subjects
- Weight and balance
- Airplane performance
- MU-2B icing consistent with the Icing Training Video for AD compliance
- Controlled Flight Into Terrain (CFIT) according to FAA guidelines
- Cockpit Resource Management/Single Pilot Resource Management (CRM/SPRM)

(4) Flight Training Minimum Program Hours are as follows:

(a) Initial/Transition: 12 hours with a minimum of 6 hours of Level E training

(b) Requalification: 8 hours, Level C or higher

- (c) Recurrent: 4 hours at Level E training, or 6 hours at Level C training
- (5) All MU-2B training programs must include flight training in the following:
- All maneuvers applicable for Commercial Multiengine Instrument Practical Test Standards (PTS) for instrument rated pilots
 - Maneuvers applicable for Commercial Multiengine PTS for non-instrument rated pilots
 - All specific maneuvers identified in Sections 2.2.1 through 2.2.4 of the FSB report as Level E training
 - All training maneuvers must be consistent with the most current FAA Approved AFM procedures (latest revision) and AFM compliant, FSB accepted checklists
 - Use of the autopilot, if installed
 - Icing Awareness Procedures applicable to the MU-2B
 - CFIT procedures and CRM/SPRM procedures

(6) Definitions for Level A, B, C, C, D, and E training can be found in Advisory Circular (AC) 120-53.

g. Operator Difference Requirement Tables. Operators use Operator Difference Requirement (ODR) tables to show their compliance methods. Sample ODR tables are available for MU-2B Initial Requirements and for MU-2B Model differences. Operators must base any additional ODR requirements on the Master Difference Requirement (MDR) Table. Coordination with the Kansas City Airplane Evaluation Group is required for any additional ODR Tables proposed by an operator.

h. Auditing Training Programs. POIs will use standard audit procedures throughout the training process and as needed upon completion of the training program in accordance with guidance in FAA Order 8400.10, Air Transportation Operations Inspector's Handbook.

i. FSB Specifications for Checking. Checking for the MU-2B is under the provisions of part 135. We consider the MU-2B a separate type of airplane as described in section 135.293(b) for the purpose of recurrent testing. Twelve-month testing currency/checking applies to the MU-2B exclusively for compliance with section 135.293. Therefore, an operator cannot satisfy the annual test requirements of section 135.293 using other airplane multi-engine land (AMEL) airplane.

j. FSB Specifications for Landing Currency. Operators must maintain the landing currency requirements of 14 CFR part 61, section 61.57 in the MU-2B airplane exclusively. Do not credit landings in other AMEL airplane for landing currency in the MU-2B airplane. Do not

credit landings in either short or long body MU-2B airplane toward landing currency in both model groups.

k. Flight Review, Section 61.56.

(1) Satisfactory completion of a flight review in accordance with part 61, section 61.56 is valid for operation of an MU-2B only if the pilot completes the flight review in an MU-2B series airplane. A flight review completed in the MU-2B series airplane satisfies the requirement for the flight review in section 61.56 for all other airplane except the Robinson R22/R44 [see SFAR 73, Section 2(c)]. The flight review for Mitsubishi MU-2B series airplane must include the Special Emphasis Items, pages 6 and 7, and all items listed in Training Course Final Phase Check, appendix A, of MHI MU-2B Training Program (Part Number YET 05301).

(2) Operators may not substitute satisfactory completion of an FAA Wings Program, as described in section 61.56(e) and Advisory Circular Number 61-91H, for the Mitsubishi MU-2B series airplane flight review.

l. Miscellaneous Recommendations.

(1) Standardized Cockpit Checklists.

(a) The FAA's test pilots evaluated a standardized checklist developed by MHI, and after modification by the manufacturer, found it to be a significant safety improvement. A standardized cockpit checklist that emphasizes proper operational procedures is critical to the safe operation of the MU-2B series airplane.

(b) MHI has developed a standardized checklist for the Mitsubishi MU-2B-60 model. The FAA's Airplane Certification Office (ACO) and the MU-2B FSB have accepted this checklist. MHI is in the process of developing checklists for the remaining models. MHI expects to complete all checklists by December 31, 2006. The MU-2B-60 checklist addresses the most complex model of the MU-2B airplane. We expect the other checklists to be similar in content where applicable. These checklists will be consistent with known configurations of the airplane as originally delivered or later modified and incorporated by MHI into the AFM.

(c) The FAA requires that all operators have onboard the airplane, accessible for each flight from the pilot station, a MHI MU-2B series airplane checklist accepted by the MU-2B FSB or other MU-2B series airplane checklist accepted by the MU-2B FSB. Flightcrew members must use this checklist when operating the airplane. In the event that the manufacturer's checklist is not compatible with an operator's airplane configuration, the Principal Operations Inspector (POI) shall work with the operator to develop an alternate checklist and submit it to the MU-2B FSB for acceptance. Operators may only use checklists reviewed and accepted by the MU-2B FSB while operating the MU-2B airplane.

(2) **Performance Data.** To support the Engine Failure After Lift-Off Procedures in the standard checklist, the FAA required MHI to publish one-engine inoperative performance data for both Flaps 5 and Flaps 20 takeoffs with the landing gear retracted. This will provide essential information to assist the pilot in deciding whether or not to continue a takeoff after experiencing an engine failure after liftoff. The Fort Worth ACO is working with MHI to ensure that MHI

includes this data in the next POH/AFM revision. The data will also be included in the back of the manufacturer's checklist, in the performance section.

(3) Autopilots.

(a) The FSB conducted a pilot workload evaluation to determine if use of an autopilot would enhance safety during single-pilot instrument flight rules (IFR) operations. Many of the recent accidents involved single pilot night-time VFR and IFR operations in high-density terminal areas with high pilot workloads. Using techniques developed by the National Aeronautics and Space Administration, FSB testing showed a significant reduction in single pilot workload and stress, improving performance when pilots used an autopilot in actual flight conditions and during LOFT scenarios. In addition, the FAA has determined that use of an autopilot provides a level of safety comparable to a two-pilot crew, and therefore, does not propose requiring a second crew member.

(b) Therefore, the FAA requires that all single pilot IFR operations, or night VFR operations when ground illumination and surface lighting references are insufficient to safely control the airplane, be conducted with a functional autopilot installed. Installed but inoperative equipment on the MU-2B airplane may be deferred in accordance with the airplane's Master Minimum Equipment List.

m. Alternate Means of Compliance. Alternate means of compliance to requirements of the MU-2B report must be approved by the FSB. An operator seeking alternate compliance must show that the proposed alternate means provides an equivalent level of safety to the provisions of AC 120-53 and this FSB report. The FSB may require analysis, demonstrations, proof of concept testing, differences documentation, or other evidence.

(1) **Equivalent Safety.** Significant restrictions may apply in the event that an operator seeks alternate compliance, and the reporting requirements may be increased to ensure equivalent safety. FAA will generally not consider relief through alternate compliance unless sufficient lead-time has been planned by an operator to allow for any necessary testing and evaluation.

(2) **Interim Programs.** In the event of clearly unforeseen circumstances in which it is not possible for an operator to comply with master differences regulation (MDR) provisions, the operator may seek an interim program approval rather than a permanent alternate compliance method. For the purposes of this provision, financial arrangements, scheduling adjustments, and other such reasons will not be considered "unforeseen circumstances."

5. ACTION.

a. FSDO/ Responsibilities. The FSDO/CHDO approves training programs after an FSB's decision is rendered. Before granting approval, the POI must determine the operator's training programs comply with the requirements of the FSB's report. This report often specifies minimum hours and specific procedures. Nonetheless, the POI should consider the adequacy of the base airplane's training program and proposed revisions to determine if the FSB's safety recommendations will be met.

(1) Before approving a training program or accomplishing proficiency checks, POIs must consult the MU-2B FSB report so all operators accomplish training, checking, and currency in accordance with the FSB report.

(2) The FSDO/CHDO must ensure that the assigned designated pilot examiners (DPE's) are advised of all pertinent FSB requirements. (Reference Order 8700.1, General Aviation Operations Inspector's Handbook, volume 2, chapter 212.)

(3) POIs will notify (by letter or email) their operators of the required revision to their approved training program. POI's will determine that the approved MHI MU-2B Training Program (Part Number YET 05301) is incorporated, by reference or other means, in its entirety into each operator's training program within 30 days. POIs should enter PTRS activity code 1303 and place "MU-2" (without quotes) in the "National Use" block.

(4) In accordance with part 135, section 135.325(d), whenever the FAA determines revisions of a curriculum granted initial or final approval are necessary, the operator will, after notification, make the necessary changes to ensure the effectiveness and acceptability of its training. Notification by the FAA effectively withdraws previous approval. These regulations also provide the operator with certain appeal rights. Therefore, POI's will follow the established procedures found in FAA Order 8400.10, volume 3, chapter 2, section 2, Training Approval Process.

(5) Once incorporated, POIs will observe training their operators conduct using the new standardized program. POIs should enter PTRS activity code 1626 and place "MU-2" (without quotes) in the "National Use" block.

b. POIs will determine, within 30 days, that their operators are in compliance with checking and currency requirements of the MU-2B FSB report.

c. POIs will determine that their operators incorporate new procedures and performance data into their operations when manufacturer's AFM and POH revisions become available.

d. POIs will determine that by February 28, 2007, their operators conduct all operations using a cockpit checklist that has been accepted by the MU-2B FSB.

e. Principal Maintenance Inspectors (PMIs) will determine that within 30 days, their operators conduct all single pilot IFR, and VFR night operations with a functional autopilot installed on board. Installed equipment on the MU-2B airplane may be deferred in accordance with the airplane's Minimum Equipment List (MEL). PMIs should enter PTRS activity code 3626 and place "MU-2" (without quotes) in the "National Use" block.

f. POIs should use the guidance in Appendices 1 and 2 of this notice, and they will bring the contents of this notice and appendices to the attention of their operators conducting operations using MU-2 airplanes.

6. SUPPORTING DOCUMENTS.

a. Common Procedures and Operational Evaluations (AC 120-53).

http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/C9574229A4AAB7E9862569EA00695F04?OpenDocument

b. MU-2B FOIA Reading Library.

http://www.faa.gov/airplane/air_cert/design_approvals/small_airplanes/cos/mu2_foia_reading_library/

c. Safety Evaluation Report.

http://www.faa.gov/airplane/air_cert/design_approvals/small_airplanes/cos/mu2_foia_reading_library/media/MU-2%20Final%20Dec%2030%202005%20with%20errata.pdf

http://www.faa.gov/airplane/air_cert/design_approvals/small_airplanes/cos/mu2_foia_reading_library/media/Appendices.pdf

http://www.faa.gov/airplane/air_cert/design_approvals/small_airplanes/cos/mu2_foia_reading_library/

d. FSB Report (Revised).

<http://www.opspecs.com/AFSDData/FSBRs/Final/MU-2%20FSB%20R1/MU-2%20FSB%20Rev1.doc>

http://dmses.dot.gov/docimages/pdf98/415670_web.pdf

http://dmses.dot.gov/docimages/pdf98/415669_web.pdf

e. Airplane Flight & Pilots Operation Manual.

http://dmses.dot.gov/docimages/pdf98/415671_web.pdf

f. Controlled Flight Into Terrain (CFIT).

http://www.faa.gov/education_research/training/media/cfit/volume1/titlepg.pdf

g. Cockpit Resource Management/Single Pilot Resource Management (CRM/SPRM).

[http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/80038cf51aace53686256e24005cbb23/\\$FILE/AC120-51e.pdf](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAdvisoryCircular.nsf/0/80038cf51aace53686256e24005cbb23/$FILE/AC120-51e.pdf)

h. FAA-Industry Training Standards (FITS) Program Plan.

http://www.faa.gov/education_research/training/fits/media/program%20plan.doc

i. MU-2 Icing Training.

[http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/0/8c4dd2bcd844ac7386256e4b0056d36e/\\$FILE/032207R1.pdf](http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/0/8c4dd2bcd844ac7386256e4b0056d36e/$FILE/032207R1.pdf)

7. DISPOSITION. We will permanently incorporate the information in this notice and the contents of appendixes 1 and 2 into FSIMS before this notice expires. This notice was developed by the Air Transportation Division, AFS-200, and the General Aviation and Commercial Division, AFS-800. Questions or comments should be directed to AFS-250 at (202) 267-8166.

ORIGINAL SIGNED BY
John Allen for
James J. Ballough
Director, Flight Standards Service

**APPENDIX 1. ORDER 8400.10, VOLUME 3, CHAPTER 2, SECTION 5,
PARAGRAPH 450, PAGE 3-244**

450. The MU-2B Flight Standardization Board (FSB) Report will be used without change or modification. The MU-2B FSB is the only entity authorized to change the contents of the report. The Mitsubishi Heavy Industries MU-2 training program will be integrated into the operators ground and flight training program without change or modification. The General Aviation and Commercial Division, AFS-800 is the only entity authorized to change the contents of the training program. The MU-2 FSB report can be found on the following Web site: <http://www.opspecs.com>.

**APPENDIX 2. ORDER 8400.10, VOLUME 3, CHAPTER 2, SECTION 6,
PARAGRAPH 512, PAGE 3-283**

512. MITSUBISHI MODEL MU-2B STANDARDIZATION BOARD REPORT (FSB). The MU-2B Flight Standardization Board (FSB) report will be used without change or modification. The MU-2B FSB is the only entity authorized to change the contents of the report. The Mitsubishi Heavy Industries MU-2 training program will be integrated into the operators ground and flight training program without change or modification. The General Aviation and Commercial Division, AFS-800 is the only entity authorized to change the contents of the training program. The MU-2 FSB report can be found on the following Web site: <http://www.opspecs.com>.