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SUBJ: CONTRACTUAL REVIEW/VALIDATION OF EQUIPMENT INSTRUCTION BOOK MANUSCRIPTS

1. PURPOSE. This directive establishes the procedures to be followed whenever contractual engineering services are to be utilized for reviewing, validating and verifying instruction book manuscripts acquired in accordance with FAA Specification FAA-D-2494, for airway facilities ground equipment/systems, procured under F&E programs assigned to the Airway Facilities Service. This directive also designates the Establishment Program Division, AAF-100, as the focal point clearing office for administrative duties involved with the contractor review/validation effort. Line divisions (Program Managers/Project Engineers) are responsible for the technical direction of the engineering services contractor in the review of the instruction book manuscripts.
2. DISTRIBUTION. This order is distributed to branch level in the Airway Facilities Service and Flight Standards Service; division level in the Logistics Service.
3. DEFINITIONS. The following definitions serve the purpose of this directive:
 - (a) Instruction Book Manuscript. Typewritten illustrated manuscripts prepared by the equipment contractor in either preliminary draft or final (reproducible) form, for equipment instruction books in accordance with Specification FAA-D-2494, Parts 1 and 2.
 - (b) In-Process Reviews. Reviews of technical manuscripts in the process of preparation. Technical manuscripts, preliminary or otherwise, will be subjected to in-process reviews prior to publishing/printing as specified in Order 6000.19, Use of Specifications FAA-D-2494/1 and 2494/2 Instruction Book Manuscript Technical: Equipment and Systems Requirements, Appendix 2, paragraph 3. Reviews may be conducted at the equipment contractor's facility, his source facility, or at a Government site, at specified times during the development of the manuscripts.

The reviews are held primarily to provide guidance to the equipment contractor, and to insure that data provided in the manuscripts are in accordance with FAA-D-2494/1 and will satisfy the FAA requirements for maintenance, operation, and training activities.

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In-process reviews are also performed to insure timely delivery of manuscripts in accordance with contract requirements.

- (c) Validation. Validation is the process by which the equipment contractor tests the manuscript for technical accuracy, relevance, and adequacy. This is accomplished by actual performance of the maintenance and operating instructions on the system or equipment for which the manuscript is written. Validation will be conducted at the contractor's facility unless otherwise specified. Validation entails the actual performance by contractor personnel, of operating and maintenance procedures, including check-out, calibration, alignment, schedule removal and replacement instructions, and associated checklists, to insure technical accuracy and adequacy. All disassembly and reassembly or scheduled removal and replacement procedures are validated by actual performance. All other cited data such as illustrated parts breakdowns, schematic diagrams, and wiring data contained in maintenance manuscripts, are validated, whenever practical, by checking against the actual equipment. When such checks are not feasible, other engineering, descriptive, or performance data may be used as a reference, as appropriate.
- (d) Verification. Verification is the process by which the manuscript is tested and proved under Governmental jurisdiction to be adequate for operation and maintenance of equipment. Verification is accomplished by the FAA or its authorized representative for the purpose of assuring that manuscripts are compatible with the hardware, and adequate for test, calibration, operation, maintenance and repair. It consists of performance of selected operating and maintenance procedures; such as, check-out, troubleshooting, alignment and scheduled removal and replacement instructions. Verification may be performed simultaneously with validation in cases where time and equipment facility availability do not permit separate verification, and procedures are relatively simple, and the likelihood of errors is slight.
- (e) Initiating Office. An office internal to the office of primary interest (OPI). This term encompasses project engineers, program managers, item managers or any other AAF personnel responsible throughout the FAA for procurement of airway facilities equipment/systems and associated documentation referencing specifications in the FAA-D-2494 series.

- (f) Clearing Office. Organizational element serving as a focal point and responsible for budgeting of funds, initiating service contract procurement request, recommending assignment, monitoring, expenditures and coordinating contractual engineering services to perform in-house process review, validation, and verification of equipment/systems instruction book manuscripts.

4. BACKGROUND. Specification FAA-D-2494 was developed in part to provide instruction books having sufficient detail and clarity that they could be used for training FAA personnel, thereby negating the need to develop and print separate training manuals. Specification FAA-D-2494 was intended to supplement an equipment acquisition contract to the extent prescribed therein, in whole or in part, as appropriate to the design concept and the maintenance concept, as well as training and logistics requirements, commensurate with system complexity and the state of the art involved. The equipment contractor is required to maintain quality and inspection programs in accordance with paragraphs 3.46 and 4.1 respectively, of Specification FAA-D-2494/1. An agency quality reliability officer (QRO) normally performs the Government inspection on the equipment contract and assures that the instruction books are correct in respect to specific contents delineated in Order 4402.1A, FAA Procurement Regulations, Subpart 12A-14.1. This QRO function does not apply to parts of an equipment contract that are covered in any service contract awarded to an out-of-agency contractor.

An agency technical officer (TO) from the initiating office represents the Contracting Officer in technical matters including in-process reviews, validation, and verification of manuscripts. The initiating office has two options of performing TO functions: within FAA organizational resources or using the engineering services contract provided by AAF-100 to supplement organizational capabilities.

5. OBJECTIVES. In the review of instruction book manuscripts, the following objectives and criteria for acceptance should be considered in the validation process:
- a. Provides complete system approach coverage to the extent specified in the contract;
 - b. Affords direct access to information about equipment, system design and function, including the degree of interaction and interdependence of all system elements as required by the average trained technician to fully understand normal operation, as well as to identify, isolate, and correct malfunctions quickly. In other words, the document should provide a precise translation of information at the man/machine interface from the abstract theoretical to the practical application, in maintaining optimum

- reliability and service availability of the equipment described;
- c. Facilitates troubleshooting and corrective maintenance, thereby enhancing facility service availability.
 - d. Facilitates preventive maintenance, thereby reducing the incidence of equipment operational failure and the probability of technician error, as well as extending the useful life of the equipment;
 - e. Obviates the necessity of preparing redundant training material on the same subject;
 - f. Provides, where possible, the type of information system which would permit field technicians to successfully maintain FAA systems and equipments to FAA standards without formal training.
6. PROCEDURE.
- a. General. Instruction book manuscripts are normally reviewed "in-house" by organizational elements concerned with the engineering and training aspects involved. However, when the need arises for supplemental engineering services to assist FAA personnel in reviewing instruction book manuscripts, the initiating office will contact the "Clearing House" AAF-100, which will arrange for the provision of such supplemental engineering services.
 - b. Utilization of Clearing House for Engineering Services. In the case where the initiating office elects to utilize engineering services to assist in the review, validation and verification of instruction book manuscripts, the following procedures shall be followed:
 - 1. The initiating office shall:
 - (a) Include a statement in the equipment/systems procurement request that in-process reviews, validation and verification of the equipment instruction book manuscripts will be performed by an outside contractor representing the FAA.
 - (b) Simultaneously with initiating the procurement request, alert the clearing office of the procurement action, identifying the equipment/system, estimated contract starting date, and contract technical specification number(s).

- (c) Write the task order for the engineering services contract and forward it to the clearing office for administrative processing.
 - (d) Monitor and coordinate the activity of the engineering services contractor.
 - (e) Exercise authority for final approval of manuscript.
2. The clearing office shall be responsible for:
- (a) Budgeting for contractor engineering services to perform the required review/validation effort, and cost-code the procurement request against appropriate funds allocations.
 - (b) Upon receipt of the task order, initiate the procurement request for obtaining the service of the engineering services contractor.
 - (c) Providing the initiating office with an approved/signed copy of the task order issued to the engineering services contractor.
 - (d) Monitoring the expenditure of funds of the engineering services contractor, and maintaining appropriate fiscal records.
 - (e) Upon final approval of instruction book manuscripts, acquire publication number, and arrange for printing and distribution of instruction books.



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