**SECTION 017823X - OPERATION AND MAINTENANCE DATA**

**PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

 A. Maryland Aviation Administration Standard Provisions for Construction Contracts, SP-8.11, Operating and Maintenance Data.

 B. Technical Specifications, specific training or operation and maintenance manual requirements.

1.2 SUMMARY

 A. This Section includes requirements for preparing manuals, including the following:

 1. Training manuals, for all required training.

 2. Operation and maintenance manuals, for the entire contract.

 3. Interim operation and maintenance manuals, for each phase of construction and partial turnover.

**PART 2 – PRODUCTS**

2.1 MANUALS, GENERAL

 A. Construction

 1. Manuals shall be submitted in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, with locking rings. Binders shall be sized to hold 8-1/2-by-11 inch paper, with spines no more than 3 inches wide. Covers and spines shall be white and shall have clear plastic sleeves to hold printed labels. The insides of covers shall have pockets to hold loose items.

 2. Index dividers shall be of heavy paper with reinforced holes and printable tabs.

 3. Loose-leaf binder pockets and sheet protectors shall be of clear plastic with punched holes.

 4. Sheet lifters shall be inserted between the front and back binder covers and the first and last sheets.

 B. Organization

 1. Arrange contents numerically by technical specification section, or alphabetically by system. If two or more binders are needed to accommodate all manual pages, organize each binder into related groupings. If possible, place information on individual specification sections or systems into a single binder.

 2. Identify each binder on front and spine with the printed title "TRAINING MANUAL," "OPERATION AND MAINTENANCE MANUAL," or "INTERIM OPERATION AND MAINTENANCE MANUAL". Labels shall also include the contract number and name, volume number, and an abbreviated list of contents.

 3. Use index dividers with printed tabs to divide sections. Provide a table of contents showing each tab and its contents. If multiple binders are used, in each binder provide a table of contents for all binders.

 4. After each divider provide a title page that states the number and name of the specification section or system, along with the name, address, and contact information for the subcontractor or supplier who installed or provided the equipment.

 5. If possible print oversize pages or drawings on 11-by-17 inch paper, folded in half and punched. Otherwise use binder pockets to hold folded oversize sheets.

 6. Use binder pockets to hold items that cannot be punched, such as samples, compact discs or DVDs.

 C. Electronic Version

 1. Provide CDs or DVDs containing an electronic version of the entire set of operation and maintenance manuals in pdf format, including all oversize sheets.

 2. Use pdf files prepared by manufacturer or supplier whenever available. Otherwise scan all pages into pdf files with a minimum resolution of 200 dpi. Use full color scans for color coded pages and grayscale scans for all other pages.

 3. Insert bookmarks for each volume, table of contents, divider, specification section, and system.

 D. Quantities

 1. Provide one training manual for each person who is to receive training.

 2. Provide four full sets of bound operation and maintenance manuals. When so directed by the Engineer, provide one additional operation and maintenance manual for individual sections such as fire protection or information techno logy.

 3. Provide three copies of the electronic version of the operation and maintenance manuals.

2.2 TRAINING MANUALS

 A. Provide training manuals for all training required by the technical specifications.

 B. Training manuals shall contain all information and references to be covered in the training sessions, and a syllabus or summary of the training provided. Include manufacturer's or supplier's published training guides if applicable.

2.3 OPERATION AND MAINTENANCE MANUALS

 A. Provide all operation and maintenance information required by the technical specifications. Use material published by or otherwise available from manufacturers or suppliers.

 B. Documents shall include, as required or as appropriate:

 1. Installation manuals.

 2. Operating procedures.

 3. Product data and cut sheets.

 4. Oversize sheets.

 5. Parts listings.

 6. Wiring diagrams.

 7. Process diagrams.

 8. Control sequences.

 9. Approved shop drawings and submittals.

 10. Test results.

 11. Inspection reports and sign-off sheets.

 12. Certifications.

 13. Warranties.

 C. For phased construction with partial turnovers, provide an interim operation and maintenance manual for each phase of the work being turned over, covering only the work being turned over. Interim manuals are in addition to the full set of operation and maintenance manuals to be provided for the entire contract.

**PART 3 - EXECUTION**

3.1 MANUAL PREPARATION

 A. Training Manuals: Where manuals contain manufacturer's standard printed data, include sheets pertinent to the product or component installed. Where one sheet shows more than one product, mark sheet to identify each product or component actually incorporated into the work. If data includes more than one item in a tabular format, identify each item using appropriate references to the contract documents.

 Provide supplementary text as available from manufacturer, supplier, or installer.

 B. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance information describing operation and maintenance of each piece of equipment or system installed. Where one sheet shows more than one product, mark sheet to identify each product or component actually incorporated into the work. If data includes more than one item in a tabular format, identify each item using appropriate references to the contract documents.

 Provide supplementary text as available from manufacturer, supplier, or installer.

 Insert additional information as provided and directed by the Engineer.

 C. Submittal due date: Submit training manuals and interim operation and maintenance manuals to the Engineer for review and comment prior to the scheduled training or partial turnover. Make corrections and submit corrected copies before the training or turnover.

 Submit full sets of operation and maintenance manuals for the entire contract within two weeks after substantial completion. Make corrections and resubmit corrected manuals within the designated contract punch list period.

**PART 4 – METHOD OF MEASUREMENT**

4.1 No separate measurement will be made for work under this Section.

**PART 5 – BASIS OF PAYMENT**

5.1 No separate payment will be made for work under this Section. The cost of the work described in this section shall be included in the individual referenced Specification sections.

**END OF SECTION 017823X**