SECTION **01 79 00** - **DEMONSTRATION AND TRAINING**

**Content Requests:**

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. SUMMARY

Section includes administrative and procedural requirements for instructing Government's personnel, including the following:

Instruction in operation and maintenance of systems, subsystems, and equipment.

Demonstration and training video recordings.

Delete "Allowances" and "Unit Price for Instruction Time" paragraphs below if a list of systems, subsystems, and equipment with corresponding length of instruction time is included at end of Part 3. See the Evaluations.

Retain "Unit Price for Instruction Time" Paragraph below with "Allowances" Paragraph above to provide a method for adjusting length of instruction time provided by the demonstration and training allowance. Coordinate with bidding and proposal forms and with requirements in Section 01 22 00 "Unit Prices."

* + - 1. INFORMATIONAL SUBMITTALS

Informational submittals are submittals that require review by Government, but they do not require Government's responsive action and return of reviewed documents to Contractor, provided submittals comply with requirements. If rejected, submittals with responsive action must be returned to Contractor.

Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 01 40 00 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

Qualification Data: For instructor.

* + - * 1. Attendance Record: For each training module, submit list of participants and length of instruction time.
				2. Evaluations: For each participant and for each training module, submit results and documentation of performance-based test.
			1. CLOSEOUT SUBMITTALS

Demonstration and Training Video Recordings: Submit two copies within seven days of end of each training module.

Identification: On each copy, provide an applied label with the following information:

Name of Project.

Name and address of videographer.

Name of Contractor.

Date of video recording.

Transcript:

Retain one of first two subparagraphs below based on Government requirements. Coordinate with requirements retained in "Demonstration and Training Video Recordings" Article.

Prepared and bound in format matching operation and maintenance manuals. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.

At completion of training, submit complete training manual(s) for Government's use prepared in same format required for operation and maintenance manuals specified in Section 01 78 23 "Operation and Maintenance Data."

* + - 1. QUALITY ASSURANCE

Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 01 40 00 "Quality Requirements," experienced in operation and maintenance procedures and training.

Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

* + - * 1. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

Retain subparagraphs below if required. If retaining, revise to include Government-specific requirements. Insert additional requirements to suit Project.

* + - 1. COORDINATION

Coordinate instruction schedule with Government's operations and Commissioning Authority. Adjust schedule as required to minimize disrupting Government's operations and to ensure availability of Government's personnel and Commissioning Authority.

* + - * 1. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
				2. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data have been reviewed and approved by Government.
			1. INSTRUCTION PROGRAM

Individual Specification Sections include requirements for demonstration and training. Government may elect to furnish report to Contractor listing applicable Sections and requirements to facilitate development of instruction program; see the Evaluations.

Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections and as follows:

Motorized doors, including overhead coiling doors and automatic entrance doors.

Equipment, including loading dock equipment, grease hoods and food‑service equipment.

Fire‑protection systems, including fire alarm and fire-extinguishing systems.

Intrusion detection systems.

Conveying systems, including elevators.

HVAC systems, including air‑handling equipment, air distribution systems and terminal equipment and devices.

HVAC instrumentation and controls.

Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies and motor controls.

Packaged engine generators, including transfer switches.

Lighting equipment and controls.

Communication systems, including intercommunication, surveillance, clocks and programming, voice and data, and television equipment.

* + - * 1. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

Basis of System Design, Operational Requirements, and Criteria: Include the following:

System, subsystem, and equipment descriptions.

Performance and design criteria if Contractor is delegated design responsibility.

Operating standards.

Regulatory requirements.

Equipment function.

Operating characteristics.

Limiting conditions.

Performance curves.

Documentation: Review the following items in detail:

Emergency manuals.

Systems and equipment operation manuals.

Systems and equipment maintenance manuals.

Product maintenance manuals.

Project Record Documents.

Identification systems.

Warranties and bonds.

Maintenance service agreements and similar continuing commitments.

Emergencies: Include the following, as applicable:

Instructions on meaning of warnings, trouble indications, and error messages.

Instructions on stopping.

Shutdown instructions for each type of emergency.

Operating instructions for conditions outside of normal operating limits.

Sequences for electric or electronic systems.

Special operating instructions and procedures.

Operations: Include the following, as applicable:

Startup procedures.

Equipment or system break-in procedures.

Routine and normal operating instructions.

Regulation and control procedures.

Control sequences.

Safety procedures.

Instructions on stopping.

Normal shutdown instructions.

Operating procedures for emergencies.

Operating procedures for system, subsystem, or equipment failure.

Seasonal and weekend operating instructions.

Required sequences for electric or electronic systems.

Special operating instructions and procedures.

Adjustments: Include the following:

Alignments.

Checking adjustments.

Noise and vibration adjustments.

Economy and efficiency adjustments.

Troubleshooting: Include the following:

Diagnostic instructions.

Test and inspection procedures.

Maintenance: Include the following:

Inspection procedures.

Types of cleaning agents to be used and methods of cleaning.

List of cleaning agents and methods of cleaning detrimental to product.

Procedures for routine cleaning.

Procedures for preventive maintenance.

Procedures for routine maintenance.

Instruction on use of special tools.

Repairs: Include the following:

Diagnosis instructions.

Repair instructions.

Disassembly; component removal, repair, and replacement; and reassembly instructions.

Instructions for identifying parts and components.

Review of spare parts needed for operation and maintenance.

Insert other requirements of Government, for example, level of proficiency of participants after instruction, percentage of participants passing evaluation test, and so on.

* + - 1. PREPARATION

Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Section 01 78 23 "Operation and Maintenance Data."

* + - * 1. Set up instructional equipment at instruction location.
			1. INSTRUCTION
				1. Engage qualified instructors to instruct Government's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

Coordinate first subparagraph below with Government/Government Agreement.

Government will furnish Contractor with names and positions of participants.

Scheduling: Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

Schedule training with Government with at least seven days' advance notice.

Revise "Training Location and Reference Manual" Paragraph below if Project circumstances make training for certain components at a remote location desirable. Coordinate below with requirements for scheduling of operation and maintenance data and demonstration and training.

Training Location and Reference Material: Conduct training on-site in the completed and using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.

* + - * 1. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a written performance-based test.
				2. Cleanup: Collect used and leftover educational materials and remove from Project site. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.
			1. DEMONSTRATION AND TRAINING VIDEO RECORDINGS

Retain this article if required.

General: Record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

At beginning of each training module, record each chart containing learning objective and lesson outline.

Revise "Digital Video Recordings" Paragraph below to suit Project. Government may have preferred format for file types based on equipment used by maintenance personnel.

Digital Video Recordings: Provide high-resolution, digital video in MPEG format, produced by a digital camera with minimum sensor resolution of 12 megapixels and capable of recording in full HD mode with vibration reduction technology.

Submit video recordings on DVD and by uploading to web-based Project management software site.

File Hierarchy: Organize folder structure and file locations in accordance with Project Manual table of contents. Provide complete screen-based menu.

File Names: Utilize file names based on name of equipment generally described in video segment, as identified in Project specifications.

Contractor and Installer Contact File: Using appropriate software, create a file for inclusion on the equipment demonstration and training recording that describes the following for each Contractor involved on the Project, arranged in accordance with Project Manual table of contents:

Name of Contractor/Installer.

Business address.

Business phone number.

Point of contact.

Email address.

Recording: Mount camera on tripod before starting recording, unless otherwise necessary to adequately cover area of demonstration and training. Display continuous running time.

Film training session(s) in segments not to exceed 60 minutes.

Produce segments to present a single significant piece of equipment per segment.

Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.

Where a training session on a particular piece of equipment exceeds 60 minutes, stop filming, and pause training session. Begin training session again upon commencement of new filming segment.

At beginning of each training module, record each chart containing learning objective and lesson outline.

Recordings are to be bookmarked to match training outline. Maximum length between bookmarks is 10 minutes.

Light Levels: Verify light levels are adequate to properly light equipment. Verify equipment markings are clearly visible prior to recording.

Retain "Narration" and "Transcript" paragraphs below if required. Requirements may be more extensive than necessary for many projects. If Government requires original video recording to be unmodified, retain first option in first paragraph below. Revise to suit Project.

Narration: Describe scenes on video recording by audio narration by microphone while recording or dubbing audio narration off-site after recording. Include description of items being viewed. Describe vantage point, indicating location, direction (by compass point), and elevation or story of construction.

* + - * 1. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.
				2. Preproduced Video Recordings: Provide video recordings used as a component of training in same format as recordings of live training.

If an allowance is not included in Part 1, insert a list of systems, subsystems, and equipment that require demonstration and training along with corresponding length of instruction time required. See the Evaluations.

1. PRODUCTS (Not Used)
2. EXECUTION (Not Used)

END OF SECTION