

SECTION 01670 - TRAINING

1.0 GENERAL

Conduct an instruction program for City's operation and maintenance personnel. Provide training for the purpose of familiarizing the City's personnel with the proper operation and maintenance of all equipment. Training shall include both classroom instruction and "hands-on" instruction held at the equipment.

Additional specific requirements for each type of equipment and/or system are identified in the Specification sections covering the various project equipment and/or systems.

2.0 INSTRUCTORS

Training for an individual component within a system shall be performed by the manufacturer's factory-certified personnel. Training provided by the system fabricator, packager, integrator, or supplier shall be in addition to the component training.

Training instructors shall be trained and familiar with giving both classroom and hands-on field training.

3.0 SCHEDULING

Conduct training after the equipment has been installed, tested, and adjusted, and prior to City acceptance for beneficial occupancy or substantial completion of the respective equipment item, unless required earlier in the progress of the work the Specification section covering that equipment or system. Training shall be a prerequisite for acceptance.

Schedule instruction periods acceptable to the City, and provide formal written notice of the proposed instruction period at least fourteen (14) days prior to commencement of the instruction period. The City will review and comment on the proposed training schedule to accommodate scheduling of its shift personnel and ongoing or forecasted workload. The duration of the training sessions may vary from one hour up through multiple days, and should be based upon the complexity of the equipment involved and the training required.

For operation and routine maintenance instruction, three separate but identical training sessions for each respective equipment item or system shall be required (on different days or sets of days for multiple day sessions) to accommodate the scheduling of City's shift personnel and City's workload. For detailed maintenance and overhaul training, and for detailed troubleshooting, repair, and programming instruction for electrical and instrumentation equipment, two separate but identical training sessions (on different days or sets of days for multiple day sessions) shall be required for each respective equipment item or system.

4.0 INSTRUCTION PROGRAM

Instruction programs shall include basic system operation theory, troubleshooting, routine maintenance and repair, "hands-on" operation of equipment, and rebuild/overhaul procedures. Provide copies of all training material (graphs, diagrams, cut-aways, charts, descriptions, instructions, etc.) used in the training sessions for the use of City's personnel in

attendance and for insertion into the O&M manuals. All training material shall become the property of the City.

Instructors shall prepare a typed agenda for each training session and submit to City with the proposed training schedule twenty-one (21) days prior to the proposed commencement of the training period. City will review and comment on the adequacy of the proposed training and training schedule. Instructors shall obtain City approval of each training session agenda prior to the start of its respective session.

Training sessions, and their respective agendas, shall be organized into topic groupings to allow City to coordinate personnel attendance with the topics being taught. For example, operators do not need to attend overhaul training. Agenda shall also include a statement of the intended audience, list of major training topics, goals and objectives for each major training topic, and motivational statements (i.e. why is this important).

Training sessions shall cover the information required in the Operation and Maintenance manuals submitted in accordance with Section 01300 and the following topics, as applicable:

- a. Operation, including theory of operation, start-up procedures, shutdown procedures, instrumentation and controls
- b. Lubrication, including changing of major fluids
- c. Operation safety
- d. Emergency situation response
- e. Troubleshooting
- f. Preventive maintenance procedures
- g. Optimizing life of equipment components
- h. Maintenance, including adjustment and/or removal and replacement of wear components
- i. Overhaul and repair, including takedown procedures, disassembly and assembly
- j. Programming
- k. Record keeping

Training for overhaul and repair on mechanical equipment, and for troubleshooting, repair, and programming on electrical, instrumentation, and control equipment shall provide sufficient detail, duration, and quality to result in factory certification for City staff receiving such training, where factory certification is available. This training shall include an examination to determine the competency of the participating students. All tests shall be scored by the instructor and results submitted to the City. Certificates shall be issued by the manufacturer to those students demonstrating a level of competency acceptable to the manufacturer. The manufacturer/instructor shall anticipate training City staff to this level of detail as follows:

Mechanical Equipment	Two separate sessions with four City maintenance staff in each session (separate days)
Electrical, Instrumentation and control	Two separate sessions with four City maintenance staff in each session (separate days)

5.0 LOCATION

All training shall be conducted at City facilities, except that training for factory certification in troubleshooting, repair, and programming of electrical, instrumentation, and control equipment may occur at the manufacturer's facility, at the manufacturer's option. Should the

manufacturer choose to conduct this factory certification training at its facilities, the Contractor shall arrange for and pay all costs for travel, lodging, meals, and other associated expenses for City staff to travel to and from, and receive training at, the manufacturer's facility, at no additional cost to the City.

6.0 RECORDING OF TRAINING SESSIONS

Contractor shall videotape record in color using VHS format, every session of the instruction program for each respective equipment item or system. Recording shall be performed by a person experienced in the operation of videotape recording equipment. Care shall be taken to properly place the camera, and provide adequate lighting and sound systems to ensure good video and audio quality. The final submitted video tape shall be subject to City approval and acceptance.

For videotape recording of "hands-on" training at the equipment, ambient noise shall be considered too loud to obtain satisfactory sound quality. For "hands-on" training sessions at the equipment, the recording shall be done without sound and the instructor shall dub a detailed narrative onto the recording by a means that will provide sound quality satisfactory to the City. Contractor shall propose a dubbing methodology to the City for approval prior to the first "hands-on" training session. Contractor is not required to videotape record factory certification training that occurs at the manufacturer's facilities, but shall record any such training that occurs at City facilities.

Label each tape identifying the session and respective equipment item or system. Multiple sessions of the same instruction program may be contained on the same tape, but only one equipment item or system shall be recorded on the same tape. The original and one copy of each tape shall be submitted to the City within seven days following completion of each respective instruction program and any post-session dubbing. Responsibility for coordinating and providing all equipment, including videotape recorder and microphones, necessary to satisfactorily record each session, including all associated costs, shall be borne by the Contractor at no additional cost to the City.

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