

1. DESCRIPTION

- .1 This Section contains requirements for training the City's personnel, by persons retained by the Contractor specifically for the purpose, in the proper operation and maintenance of the equipment and systems installed under this Contract.
- .2 Two categories of training sessions are required: one during the testing and commissioning period, and one during the Warranty Period, approximately six (6) months after Total Performance. The intent of the latter training session is to enable the City's personnel to ask particular questions on the operation of the specified equipment, based on their actual experience.
- .3 As a minimum, the Contractor is to allow at least 4 to 8 hours of training as required for each item of equipment or system. Refer to the technical specifications for specific time periods for some equipment and systems.
- .4 Some training of the section is expected to have a longer duration, e.g., process system, control system, etc. The intent is that the City's personnel should receive sufficient training on the equipment system that they are going to operate and maintain. The Contract Administrator shall have the authority to determine the duration and content of each training session required.
- .5 The Contractor shall work with the equipment suppliers for City supplied equipment to conduct coordinated training.

2. QUALITY ASSURANCE

- .1 Training includes instruction of the City's personnel in equipment operation and preventive maintenance and instruction of mechanics, electricians, instrumentation and communications technicians in normal maintenance up to major repair.
- .2 Where required by the detailed Specifications, provide on-the-job training of the City's personnel. Training sessions will be conducted by qualified, experienced (2 years minimum), factory-trained representatives of the various equipment manufacturers. Trainers will be capable of providing "trained in training" in the sessions provided.

3. SUBMITTALS

- .1 Submit the following information in accordance with Section 01300. For phased testing and start-up activities, separate submittals can be prepared for equipment items or systems. The material will receive a "reviewed" or "reviewed as modified" status by the Contract Administrator no later than 4 weeks prior to delivery of the training:
 - .1 Lesson plans and training manuals, handouts, visual aids, and other reference materials for each training session to be conducted by the manufacturer's representatives.
 - .2 Date, time, and subject of each training session and identity and qualifications of individuals to be conducting the training.

- .3 Training schedule. Concurrent classes will not be allowed.
- .2 Provide the following to verify the trainers qualifications:
 - .1 Certification in related coursework.
 - .2 Three references for similar assignments where training was conducted for operation and maintenance staff..

4. LOCATION

- .1 Where specified, conduct training sessions for the City's operation and maintenance personnel on the operation, care, and maintenance of the equipment and systems installed under this Contract. Training will take place at the site of the Work and under the conditions specified in the following paragraphs. Vendor operation and maintenance manuals will be reviewed and accepted at least 30 days prior to the date scheduled for the individual training session.
- .2 Field training sessions will take place at the site of the equipment. Classroom training to take place in the multi-purpose room in the existing administration building. The Contract Administrator may direct the classroom training to take place at another suitable location.

5. LESSON PLANS

- .1 Prepare formal written lesson plans for each training session and coordinate with the Contract Administrator. Lesson plans to contain an outline of the material to be presented along with a description of visual aids to be utilized during the session. Each plan will contain a time allocation for each subject. Furnish fifteen copies of necessary training manuals, handouts, visual aids and reference materials at least 2 weeks prior to each training session.

6. FORMAT AND CONTENT

- .1 Include time in the classroom and at the location of the equipment or system for each training session. As a minimum, cover the following topics for each item of equipment or system:
 - .1 Familiarization
 - .2 Safety
 - .3 Operation
 - .4 Troubleshooting
 - .5 Preventive maintenance
 - .6 Corrective maintenance

- .7 Parts
- .8 Local representatives

7. VIDEO RECORDING

- .1 Video record each training session to provide a permanent record for the City's use. Turn video tapes over to the Contract Administrator after the training is completed. Advise all manufacturers providing training sessions that the training material will be videotaped.

8. TRAINING

8.1 General Requirements

- .1 Conduct training in conjunction with the operational testing and commissioning periods. Schedule classes such that classroom sessions are interspersed with field instruction in logical sequence. Arrange to have the training conducted on consecutive days, with no more than 6 hours of classes scheduled for any one day.
- .2 Provide acceptable operation and maintenance manuals, as defined in Section 01300, for the specific equipment to the City at least 12 weeks prior to the start of any training.

8.2 Operator Classroom Training

- .1 As a minimum, classroom equipment training for operations personnel will include:
 - .1 The equipment's specific location in the plant and an operational overview. Use slides and drawings to aid discussion.
 - .2 Purpose and plant function of the equipment.
 - .3 The operating theory of the equipment.
 - .4 Start-up, shutdown, normal operation, and emergency operating procedures, including system integration and electrical interlocks, if any.
 - .5 Safety items and procedures.
 - .6 Routine preventive maintenance, including specific details on lubrication and maintenance of corrosion protection of the equipment and ancillary components.
 - .7 Operator detection, without test instruments, of specific equipment trouble symptoms.
 - .8 Required equipment exercise procedures and intervals.
 - .9 Routine disassembly and assembly of equipment if applicable for purposes such as operator inspection of equipment.

8.3 Operator Hands-On Training

- .1 As a minimum, hands-on equipment training for operations personnel will include:
 - .1 Identifying instrumentation: Location of primary element; location of instrument readout; discuss purpose, basic operation, and information interpretation.
 - .2 Discussing, demonstrating, and performing standard operating procedures and round checks.
 - .3 Discussing and performing the preventive maintenance activities.
 - .4 Discussing and performing start-up and shutdown procedures.
 - .5 Performing the required equipment exercise procedures.
 - .6 Performing routine disassembly and assembly of equipment if applicable.
 - .7 Identifying and reviewing safety items and performing safety procedures, if feasible.

8.4 Maintenance Classroom Training

- .1 Classroom equipment training for the maintenance and repair personnel will include:
 - .1 Basic theory of operation.
 - .2 Description and function of equipment.
 - .3 Routine start-up and shutdown procedures.
 - .4 Lockout procedures and the location of lockouts.
 - .5 Normal and major repair procedures.
 - .6 Equipment inspection and troubleshooting procedures including the use of applicable test instruments and the "pass" and "no pass" test instrument readings.
 - .7 Routine and long-term calibration procedures.
 - .8 Safety procedures.
 - .9 Preventive maintenance such as lubrication; normal maintenance such as belt, seal, and bearing replacement; and up to major repairs such as replacement of major equipment part(s) with the use of special tools, bridge cranes, welding jigs, etc.

8.5 Maintenance Hands-On Training

- .1 Hands-on equipment training for maintenance and repair personnel will include:
 - .1 Locating and identifying equipment components.
 - .2 Reviewing the equipment function and theory of operation.
 - .3 Reviewing normal repair procedures.
 - .4 Performing routine start-up and shutdown procedures.

- .5 Reviewing and performing the safety procedures.
- .6 Performing City-approved practice maintenance and repair job(s), including mechanical and electrical adjustments and calibration and troubleshooting equipment problems.
- .7 Reviewing and using equipment manufacturer's manuals in the hands-on training.

8.6 Equipment and Systems for Training

- .1 As a minimum, provide training during the Commissioning Period for the following equipment and systems:
 - .1 UV Reactors
 - .2 Flowmeters
 - .3 Isolation Valves
 - .4 Valve Actuators
 - .5 Transformers
 - .6 Air Handling Unit
 - .7 Other equipment specified in the Technical Specifications.
- .2 Coordinate training with training that is provided by others under the City Supplied Equipment Contracts.
- .3 Provide training for the equipment during the Warranty Period (six (6) months after the issue of the Total Performance Certificate).
- .4 Coordinate and finalize with the Contract Administrator on training schedules and duration of each training session.

8.7 Training Completion Forms and Payment

- .1 Form 205: To be completed for initial training. One (1) form is to be used for each equipment/ system for which training has been provided.

**CERTIFICATE OF SATISFACTORY TRAINING
FORM 205**

We certify that the initial training for the equipment listed below has been provided as per the Specifications.

PROJECT: _____

ITEM OF EQUIPMENT: _____

TAG NO: _____

**REFERENCE
SPECIFICATION:** _____

(Trainer)

Date

(Authorized Signing Representative of the City)

Date

END OF SECTION