STANDARDS OF APPRENTICESHIP
adopted by

STATIONARY ENGINEER TRAINING TRUST
(sponsor name)

Occupational Objective(s):	SOC#	Term
STATIONARY ENGINEER	**51-8021.00**	**8000 HOURS**
FACILITIES CUSTODIAL ENGINEER	**37-2011.00**	**4000 HOURS**

APPROVED BY
Washington State Apprenticeship and Training Council
REGISTERED WITH
Apprenticeship Section of Specialty Compliance Services Division
Washington State Department Labor and Industries
Post Office Box 44530
Olympia, Washington 98504-4530

APPROVAL:

JANUARY 16, 2014 Initial Approval	APRIL 21, 2016 Committee Amended
APRIL 21, 2016 Standards Amended (review)	APRIL 17, 2014 Standards Amended (administrative)
By: LEE NEWGENT Chair of Council	By: ELIZABETH SMITH Secretary of Council

STATIONARY ENGINEER TRAINING TRUST

INTRODUCTORY STATEMENT

The director of the Department of Labor and Industries appointed the Washington State Apprenticeship and Training Council (WSATC) as the regulatory body responsible for developing, administering, and enforcing apprenticeship program standards (Standards) for the operation and success of apprenticeship and training programs in the State of Washington. Apprenticeship program sponsors function, administer, or relinquish authority only with the consent of the WSATC. Furthermore, only apprentices registered with the supervisor or recognized under the terms and conditions of a reciprocal agreement will be recognized by the WSATC. Parties signatory to these standards of apprenticeship declare their purpose and policy is to establish and sponsor an organized system of registered apprenticeship training and education.

These Standards are in conformity and are to be used in conjunction with the Apprenticeship Rules, chapter 296-05 WAC (Washington Administrative Code); Apprenticeship Act, chapter 49.04 RCW (Revised Code of Washington); The National Apprenticeship Act, 29 U.S.C. (United States Code) 50; Apprenticeship Programs, Title 29 Part 29 CFR (Code of Federal Regulations); and Equal Employment Opportunity in Apprenticeship and Training, Title 29 Part 30 CFR which govern employment and training in apprenticeable occupations. They are part of this apprenticeship agreement and bind all signers to compliance with all provisions of registered apprenticeship. Additional information may need to be maintained by the program sponsor that is supplemental to these apprenticeship standards. This information is for purposes of ensuring compliance with decisions of the WSATC and the apprenticeship laws identified above.

If approved by the council, such amendment/s and such changes as adopted by the council shall be binding to all parties. Program sponsors shall notify apprentices and employer training agents (if applicable) of changes when they are adopted by the council. If and when any part of these Standards becomes illegal, as pertains to federal and/or state law, that part and that part alone will become inoperative and null and void, and the Department of Labor and Industries (Department) may adopt language that will conform to applicable law. The remainder of the Standards will remain in full force and effect.

Sections of these standards identified as bold "insert text" fields are specific to the individual program standards and may be modified by a sponsor submitting a revised standard for approval by the WSATC. All other sections of the standards are boilerplate and may only be modified by the WSATC.

See WAC 296-05-003 for the definitions necessary for use with these Standards.

Sponsor Introductory Statement (Optional): **The following Standards for the development of Stationary Engineer apprentices have been prepared by Facilities and Custodial Engineer experts from IUOE Local 609 and assisted by the Apprenticeship Division, Department of Labor and Industries. When approved and registered with the Washington State Apprenticeship Council, these Standards will govern the training of apprentices in the industry.**

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I. GEOGRAPHIC AREA COVERED:

The sponsor has no authority to conduct training outside of the geographical area covered by these Standards. The sponsor may enter into an agreement [portability agreements – see WAC 296-05-303(4)(g)] with other sponsors for the use of apprentices by training agents that are working outside of their approved geographic area. Also, the WSATC may recognize and approve out-of-state apprenticeship programs and standards if certain conditions are met and the out-of-state sponsoring entity requests it (see WAC 296-05-327). Apprenticeship program sponsors will ensure compliance with the provisions of any agreement recognized by the WSATC.

The area covered by these standards shall be the City of Seattle, Washington.

II. MINIMUM QUALIFICATIONS:

Minimum qualifications must be clearly stated and applied in a nondiscriminatory manner [see WAC 296-05-316(17)].

Age:	**Shall not be less than eighteen (18) years of age at time of application.**
Education:	**Must have high school or GED.**
Physical:	**Must be able to meet the needs of the trade.**
Testing:	**N/A**
Other:	**N/A**

III. CONDUCT OF PROGRAM UNDER WASHINGTON EQUAL EMPLOYMENT OPPORTUNITY PLAN:

Sponsors with five (5) or more apprentices must adopt an Equal Employment Opportunity (EEO) Plan and Selection Procedures (see Part D of chapter 296-05 WAC and 29 CFR Part 30).

The recruitment, selection, employment and training of apprentices during their apprenticeship shall be without discrimination because of race, sex, color, religion, creed, national origin, age, sexual orientation, marital status, veteran or military status, the presence of a disability or any other characteristic protected by law. The sponsor shall take positive action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required by the rules of the Washington State Apprenticeship and Training Council (chapter 296-05 WAC) and Title 29, Part 30 of the Code of Federal Regulations.

STATIONARY ENGINEER TRAINING TRUST

A. Selection Procedures:

1. The International Union of Operating Engineers Union, Local 609 and the Stationary Engineers Training Trust Apprenticeship Committee will not be serving as a referral agency. Persons desiring apprenticeship training under the Stationary Engineers Training Trust shall make application to an employer approved by the Apprenticeship Committee and, on becoming employed, shall be interviewed by a representative of the Apprenticeship Committee. At this interview, the applicant shall be informed of the obligation to abide by the Standards established for the trade. Upon acceptance of the applicant, the Apprenticeship Committee shall make an evaluation based on the employer's recommendation and place him/her in the proper work experience and wage progression period and register the applicant with the Registration Agency.

2. The applicant will sign the "Record of Apprentice Applicants" form and will be given an "Application for Apprenticeship" and will return same to Apprenticeship Coordinator.

3. The applicant will be instructed to request a transcript of all school records, which will be forwarded to the Apprenticeship Committee Coordinator.

4. Applicants will be instructed to attend a regular meeting of the Apprenticeship Committee and/or Apprenticeship Committee Coordinator in which the applicant is to be registered. The purpose of the applicant's attendance is to explain the apprenticeship program and the responsibilities the apprentice must fulfill during the term of apprenticeship.

5. All employers hiring apprentices must sign a compliance form agreeing to be bound by the Affirmative Action Program contained in these Standards and as approved by the Washington State Apprenticeship and Training Council.

B. Equal Employment Opportunity Plan:

1. Participation in annual workshops, if available, designed to familiarize all concerned with the apprenticeship system and current opportunities.

2. Cooperate with school boards, community colleges and vocational schools to develop programs, which prepare students for entrance into apprenticeship.

3. **Disseminate information, within shops or concerns, concerning equal opportunity policies of the program's Sponsor(s).**

4. **Grant credit for previous trade experience or trade-related courses for all applicants equally.**

5. **Engage in any other such action as stated above to ensure that recruitment, selection, employment and training of apprentices during apprenticeship shall be without discrimination because of race, color, religion, national origin or sex.**

Discrimination Complaints.
Any apprentice or applicant for apprenticeship who believes they have been discriminated against may file a complaint (WAC 296-05-443).

IV. TERM OF APPRENTICESHIP:

The minimum term of apprenticeship must not be less than 2000 hours of reasonably continuous employment in each occupation identified in these Standards. The term of apprenticeship must be stated in hours of employment [WAC 296-05-316(1)].

The term of apprenticeship for Stationary Engineer shall be four (4) years (8000 hours) of reasonably continuous employment divided into eight (8) equal pay periods of six (6) months duration, including the probationary period.

The term of apprenticeship for Facilities Custodial Engineer Apprentices shall be two (2) years (4000 hours) of reasonably continuous employment divided into four (4) equal pay periods of six (6) months duration, including the probation period.

V. INITIAL PROBATIONARY PERIOD:

All apprentices are subject to an initial probationary period, stated in hours or months of employment for which they receive full credit toward completion of apprenticeship. Advance credit/standing will not reduce the initial probationary period. The initial probationary period [WAC 296-05-316(22)]:

1. Is the period following the apprentice's registration into the program and during which the apprentice's appeal rights are impaired. The initial probation must not exceed twenty percent (20%) of the term of apprenticeship or one year from date of registration, unless an exemption by the WSATC has been granted for longer probationary periods as specified by Civil Service or law.

2. Is the period that the WSATC or the supervisor of apprenticeship may terminate an apprenticeship agreement at the written request by any affected party. The

sponsor or the apprentice of the apprenticeship agreement may terminate the agreement without a hearing or stated cause. An appeal process is available to apprentices who have completed the initial probationary period.

The probationary period for Stationary Engineer Apprentices shall be not less than the first six (6) months (1000 hours) of reasonably continuous employment.

The probationary period for Facilities Custodial Engineer Apprentices shall be not less than the first (800 hours) or reasonably continuous employment.

VI. RATIO OF APPRENTICES TO JOURNEY LEVEL WORKERS:

Supervision is the necessary education, assistance, and control provided by a journey-level employee that is on the same job site at least seventy-five percent of each working day, unless otherwise approved by the WSATC. The sponsor will assure that apprentices are under the supervision of competent and qualified journey-level workers on the job who are responsible for the work being performed, to ensure safety and training in all phases of the work. Apprentices will work the same hours as journey-level workers, EXCEPT where such hours may interfere with related/supplemental instruction [WAC 296-05-316(5)].

A. Stationary Engineer

1. One (1) apprentice per every four (4) engineers employed in a specific facility. There shall be no more than two (2) apprentices employed at one time in any specific facility, regardless of the number of journey-level workers employed in that facility at the time. By special request to Stationary Engineers Training Trust Apprenticeship Committee an employer may request up to four (4) apprentices at a specific facility. Such a ratio shall not be exceeded unless agreed to per the Collective Bargaining Agreement.

2. An employer facility having three (3) or less engineers employed shall be entitled to one (1) apprentice.

B. Facilities Custodial Engineer

1. Ratio of apprentices will be one (1) apprentice to one (1) journey-level worker in a specific facility.

VII. APPRENTICE WAGES AND WAGE PROGRESSION:

The apprentice will be paid a progressively increasing schedule of wages based on specified percentages of journey-level wage consistent with skills acquired [WAC 296-05-316(27)]. These may be indicated in hours or monthly periods set by the sponsor. The entry wage will not be less than the minimum wage prescribed by the Fair Labor

Standards Act, where applicable, unless a higher wage is required by other applicable federal law, state law, respective regulations, or by collective bargaining agreement.

The sponsor may accelerate, by an evaluation process, the advancement of apprentices who demonstrate abilities and mastery of the occupation to the level for which they are qualified. When the apprentice is granted advanced standing the sponsor must notify the employer/training agent of the appropriate wage per the wage progression schedule specified in these Standards.

A. Stationary Engineer

Step	Number of hours/months	Percentage of journey-level rate
1	**0000 - 1000 hours**	**60%**
2	**1001 - 2000 hours**	**65%**
3	**2001 - 3000 hours**	**70%**
4	**3001 - 4000 hours**	**75%**
5	**4001 - 5000 hours**	**80%**
6	**5001 - 6000 hours**	**85%**
7	**6001 - 7000 hours**	**90%**
8	**7001 - 8000 hours**	**95%**

B. Facilities Custodial Engineer

Step	Number of hours/months	Percentage of journey-level rate
1	**0000 - 1000 hours**	**70%**
2	**1001 - 2000 hours**	**75%**
3	**2001 - 3000 hours**	**85%**
4	**3001 - 4000 hours**	**95%**

VIII. WORK PROCESSES:

The apprentice shall receive on the job instruction and experience as is necessary to become a qualified journey-level worker versed in the theory and practice of the occupation covered by these Standards. The following is a condensed schedule of work experience, which every apprentice shall follow as closely as conditions will permit.

Employers/training agents shall only use registered apprentices to perform the work processes as stated in this section. [WAC 296-05-303(5)(f)]

A. Stationary Engineer **Approximate Hours**

The apprentice will work directly under a journey level engineer and from whom the apprentice will receive instruction in all phases of the trade. This experience is to develop a practical and skilled engineer versed in the theory and practice of the Stationary Operating Engineers trade.

The major processes in which the apprentices will be trained and the approximate number of hours to be spent on each process are as follows:

1. Plant Operations 600

- **a. Air Compressors**
- **b. Air Conditioners**
- **c. Air Dryers**
- **d. Boilers**
- **e. Chillers**
  - **(1) Absorption**
  - **(2) Reciprocating**
  - **(3) Centrifugal**
- **f. Controls**
  - **(1) Direct Digital**
  - **(2) Electric**
  - **(3) Electronic**
  - **(4) Pneumatic**
- **g. Cooling Towers**
- **h. Fan Units**
- **i. Fire Alarm Systems**
- **j. Heat Exchangers**
  - **(1) Air to Air**
  - **(2) Air to Water**
  - **(3) Water to Air**
  - **(4) Water to Water**
- **k. Heat Pumps**
- **l. Humidifiers**
- **m. Lighting**

n. Motors and Motor Starters
o. Production Equipment
p. Pumps
q. Refrigeration Equipment
r. Resource Recovery and CO-Generation Equipment
AC/DC Power Generation
s. Steam Turbines and Engines
t. Special Machinery

2. Monitoring Plant Operations.....800

a. Air Compressor
(1) Check oil pressure
(2) Check oil level
(3) Check pressure controls for proper operation
(4) Drain moisture from receiver
(5) Check cooling water temperature
(6) Investigate any unusual operation or noise

b. Air Conditioners
(1) Check air and/or water flow
(2) Check for proper temperature control
(3) Check for proper operation of electrical controls
(4) Investigate any unusual operation or noise

c. Air Dryers
(1) Check oil pressure
(2) Check oil level
(3) Check air differential pressures
(4) Check pressure controls for proper operation
(5) Drain moisture traps
(6) Check air discharge temperatures
(7) Investigate any unusual operation or noise

d. Boilers
(1) Check water level
(2) Drain gauge glass
(3) Check low water controls
(4) Check high water controls
(5) Blowdown water column
(6) Check surface blowdown
(7) Perform a bottom blowdown
(8) Check flame failure controls
(9 Perform a water analysis and treat accordingly
(10) Check fuel oil temperature and pressure
(11) Check atomizing air/steam pressure
(12) Check fuel oil tank quantity and moisture
(13) Check steam/water temperature/pressure
(14) Check the feedwater temperature and pressure
(15) Check quantity of make-up water

(16) Check flue gas temperature and opacity
(17) Clean and change burners
(18) Check burner operation
(19) Clean oil and water strainers
(20) Investigate any unusual operation or noise

e. Chillers
(1) Check the compressor oil level, temperature and pressure
(2) Check the suction and discharge temperature/pressure
(3) Check the inlet vane ore slide vane position
(4) Check the motor amperage and voltage
(5) Check the steam pressure
(6) Check the cooler refrigerant temperature and pressure
(7) Check the brine concentrations
(8) Check the cooler water inlet and outlet temperature and pressures
(9) Check the condenser refrigerant temperature and pressure
(10) Check the condenser water inlet and outlet temperature and pressures
(11) Investigate any unusual operation or noise

f. Controls
(1) Direct Digital
Monitor computer-controlled equipment, temperatures, pressures, volumes, etc.
(2) Electric
Monitor electric-controlled equipment, temperatures, pressures, volumes, etc.
(3) Electronic
Monitor electronic-controlled equipment, temperatures, pressures, volumes, etc.
(4) Pneumatic
Monitor pneumatic-controlled equipment, temperatures, pressures, volumes, etc.

g. Cooling Towers
(1) Check for proper fan, pump, and damper operation
(2) Check sump water level
(3) Perform a water analysis and treat accordingly
(4) Investigate any unusual operation or noise

h. Fan Units
(1) Check for vibration
(2) Visual check of belts and/or couplings
(3) Check motor and fan bearing temperatures

(4) Check inlet/outlet van/damper operation
(5) Check pressure and/or temperature differentials across heating coils, cooling coils, humidifiers, filter banks, etc)
(6) Investigate any unusual operation or noise

i. Fire Alarm Systems
(1) Disable/enable zones as needed
(2) Perform emergency procedures as directed by the Fire Department.
(3) Check trouble zones.
(4) Investigate any unusual operation.

j. Heat Exchangers
(1) Air to Air
Check pressure and/or temperature differentials of all air stream and filter banks.
(2) Air to Water
Check pressure and/or temperature differentials of all air and water streams and filter banks.
(3) Water to Air
Check pressure and/or temperature differentials of all air and water streams and filter banks.
(4) Water to Water
Check pressure and/or temperature differentials of all water streams and filter banks.

k. Heat Pumps
(1) Check air and/or water flow
(2) Check for proper temperature control
(3) Check for proper operation of electrical controls
(4) Investigate any unusual operation or noise

l. Humidifiers
(1) Check pans for proper level and purging and/or drainage
(2) Check for proper nozzle operation
(3) Check for proper lamp operation
(4) Investigate any unusual operation or noise

m. Lighting
(1) Check for burned out lamps and/or ballast
(2) Check for proper lighting levels

n. Motors and Motor Starters
(1) Check for vibration
(2) Visual check of belts and/or couplings
(3) Check motor bearing temperatures
(4) Check amperage and voltage readings
(5) Investigate any unusual operation or noise

o. Production Equipment

(1) Check bearings, belts, sprockets, sheaves, chains, and conveyers for proper tension, lubrication and operation
(2) Monitor temperatures, pressures, and flow rates
(3) Check for proper operation of electrical controls
(4) Investigate any unusual operation or noise

p. Pumps
(1) Check for vibration
(2) Visual check of belts and/or couplings
(3) Check motor and pump bearing temperatures
(4) Check inlet/outlet valve operation and position
(5) Check pressure and/or temperature differentials across pump
(6) Investigate any unusual operation or noise

q. Refrigeration Equipment
(1) Check air and/or water flow
(2) Check for proper temperature control
(3) Check for proper operation of electrical controls
(4) Investigate any unusual operation or noise

r. Resource recovery and co-generation equipment AC/DC Power Generation
(1) Check for proper temperatures and pressures
(2) Check amperage and voltage readings
(3) Check for proper fuel levels and filtering
(4) Check for proper cooling and air flows
(5) Check for proper synchronization and phases
(6) Check for proper operation of electrical controls
(7) Investigate any unusual operation or noise

s. Steam Turbines and Engines
(1) Check for proper steam pressures and temperatures
(2) Check for proper pressures and temperatures for lubrication
(3) Check for proper speed and control
(4) Investigate any unusual operation or noise

t. Special Machinery
(1) Check for proper temperatures and pressures
(2) Check for proper lubrication
(3) Check amperage and voltage readings
(4) Check for proper operation of electrical controls
(5) Check bearing, belts, sprockets, sheaves, chains, and conveyors for proper tension, lubrication and operation
(6) Investigate any unusual operation or noise

3. Diagnostic Analysis.....2000

- **a. Water Analysis**
  - **(1) Hot water boilers**
  - **(2) Steam boilers**
  - **(3) Closed-loop heating systems**
  - **(4) Closed-loop cooling systems**
  - **(5) Condenser water**
  - **(6) Chilled water**
- **b. Boiler/furnace stack gases analysis**
  - **(1) Temperature**
  - **(2) CO, CO_2, O_2, NO_X**
- **c. Ambient Air Conditions**
  - **(1) Temperature**
  - **(2) Carbon Dioxide**
  - **(3) Oxygen**
  - **(4) Humidity**
  - **(5) Contaminates**
- **d. Process wastewater**
  - **(1) PH**
  - **(2) Contaminates**
- **e. Testing the "Sequence of Operation" for the following equipment:**
  - **(1) Air Compressors**
  - **(2) Air Conditioners**
  - **(3) Air Dryers**
  - **(4) Boilers**
  - **(5) Chillers**
  - **(a) Absorption**
  - **(b) Reciprocating**
  - **(c) Centrifugal**
  - **(6) Controls**
  - **(a) Direct digital controls**
  - **(b) Electric controls**
  - **(c) Electronic controls**
  - **(d) Pneumatic controls**
  - **(7) Cooling towers**
  - **(8) Fan units**
  - **(9) Fire alarm systems**
  - **(10) Heat exchangers**
    - **(a) Air to air**
    - **(b) Air to water**
    - **(c) Water to air**
    - **(d) Water to water**
  - **(11) Heat pumps**
  - **(12) Humidifiers**
  - **(13) Motor starters**

(14) Production equipment
(15) Pumps
(16) Refrigeration equipment
(17) Resource recovery and CO-generation equipment
(18) Steam Turbines and Engines
(19) Variable Speed Drive controls
(20) Special machines within the craft jurisdiction by contract

f. Electrical

(1) Testing for continuity, grounds, short circuits, etc., on the electrical circuits of:

(a) Air Compressors
(b) Air Conditioners
(c) Air Dryers
(d) Boilers
(e) Chillers
(f) Controls
1) Transformers
2) Solenoid operations
3) Timers and timing devices
4) Control devices
5) Connecting three-phase and single-phase motors
6) Reversing motor direction
7) Reduced voltage starting
8) Overload protection/overload heater selection.
9) Inherent motor protection
10) Braking circuits
11) Photo-electric/proximity sensors
12) Programmable controllers
13) Direct digital Controllers
14) Contactors, starters and relays
15) Motor control centers
16) Variable Speed Drives
(g) Cooling towers
(h) Fan units
(i) Fire alarm systems
(j) Heat Exchangers
1) Air to air
2) Air to water
3) Water to air
4) Water to water
(k) Heat pump
(l) Humidifiers

(m) Lighting
(n) Motors and motor starters
(o) Production equipment
(p) Pumps
(q) Resource recovery and co-generation equipment
(r) Steam Turbines and Engines
(s) Special machines within the craft jurisdiction by contract

(2) Circuit analysis
(a) Ohms law
(b) Rules of line diagrams
(c) Wire codes and amperage calculations
(d) Numerical cross referencing
(e) Wiring diagrams
(f) Torque and horsepower
(g) AC/DC motor speed control
(h) Solid state starting/speed control
(i) Photo-electric control
(j) Inspection and analysis of mechanical equipment
1) Inspect bearings, belts, sprockets, sheaves, chains, etc.
2) Vibration analysis

g. Commissioning
(1) Retro or Re-Commissioning practices
(2) Energy use analysis
(3) Functional Performance Testing

4. Preventive Maintenance.....1200
Perform the daily, weekly, monthly, quarterly, semi-annual, and annual mechanical and electrical maintenance as needed on the following equipment:
a. Air Compressors
b. Air Conditioners
c. Air Dryers
d. Bearings adjustment
e. Boilers
f. Chillers
g. Controls
(1) Direct digital controls
(2) Electric controls
(3) Electronic controls
(4) Pneumatic controls
h. Cooling towers
i. Electrical Distribution

j. Fan units
k. Fire alarm systems
l. Heat exchangers
(1) Air to air
(2) Air to water
(3) Water to air
(4) Water to water
m. Heat pump
n. Humidifiers
o. Lighting
p. Motor control centers
q. Motors and motor starters
r. Production equipment
s. Pumps
t. Refrigeration equipment
u. Resource recovery and co-generation equipment
v. Steam Turbines and Engines
w. Transformers
x. Any other mechanical/electrical device found in the field

5. Mechanical Repairs 700
Perform the needed mechanical repairs on the following equipment
a. Air Compressors
b. Air Conditioners
c. Air Dryers
d. Boilers
e. Chillers
f. Controls
g. Direct digital controls
(1) Electric controls
(2) Electronic controls
(3) Pneumatic controls
h. Cooling towers
i. Fan units
j. Fire alarm systems
k. Heat exchangers
(1) Air to air
(2) Air to water
(3) Water to air
(4) Water to water
l. Heat pumps
m. Humidifiers
n. Lighting
o. Motors and motor starters

- **p. Production equipment**
- **q. Pumps**
- **r. Refrigeration equipment**
- **s. Resource recovery and co-generation equipment**
- **t. Steam turbines and engines**
- **u. Any other mechanical device found in the field**

6. Plant safety 500

- **a. Lockout and tagout of energy sources**
- **b. Industrial/CPR first aid c. Hazardous material**
- **d. Chemical identification safety e. Emergency procedures**
- **f. OSHA/WISHA/EPA Standards and Regulations**
- **g. General electrical/mechanical safety**
- **h. Industrial Accidents/Reporting**
- **i. Plant general up-keep**

7. Fabrication 800

- **a. Welding and use of oxy-acetylene equipment**
- **b. Metal cutting power machine**
- **c. Shop and bench work**
- **d. Job planning**
- **e. Line voltage/low voltage circuitry**
- **h. Circuit Analysis**
  - **(1) Ohms law**
  - **(2) Rules of line diagrams**
  - **(3) Wire codes and amperage calculations**
  - **(4) Numerical cross referencing**
  - **(5) Wring Diagrams**
  - **(6) Torque and horsepower**
  - **(7) AC/DC motor speed control**
  - **(8) Solid state starting/speed control**
  - **(9) Photo-electric control**
  - **(10) Panel box connections**
  - **(11) Conduit bending**
  - **(12) Control devices**
  - **(13) Connecting three-phase and single-phase motors**
  - **(14) Reversing motor direction**
  - **(15) Reduced voltage starting**
  - **(16) Overload protection/overload heater selection**
  - **(17) Inherent motor protection**
  - **(18) Braking circuits**
  - **(19) Photo-electric/proximity sensors**
  - **(20) Programmable controllers**
  - **(21) Direct digital controllers**

8. Electrical Repairs……1400

Perform the needed electrical repairs on the following equipment:

- **a. AC/DC power generation equipment**
- **b. Transformers and solenoids**
- **c. Contactors, relays and starters**
- **d. Line voltage and control voltage wiring**
- **e. Motor overload protection**
- **f. Timers and timing devices**
- **g. Motor control centers**
- **h. Control devices and sensors**
- **i. Programmable controllers**
- **j. Direct digital controllers**
- **k. Any other line voltage and/or low voltage device encountered in the field**
- **l. Variable Speed Drives**

In addition, the apprentice will be taught the use, care and safe handling of all tools, materials and apparatus commonly used in connection with the Stationary Operating Engineers trade.

TOTAL HOURS: 8000

B. Facilities Custodial Engineer **Approximate Hours**

1. Safety.....250

a. Industrial First Aid
b. Hazardous Materials
c. Chemical Identification Safety d. Emergency Procedures
e. Equipment Safety and Eye Protection
f. OSHA/WISHA/EPA Standards/Regulations
g. General Safety
h. Industrial Accidents/Reporting

To include all the necessary documents and reporting forms related to safety.

2. Facilities Operating Responsibilities.....500

a. Permits and Licenses
b. Heating/Ventilation
c. Security
d. Utilities
e. Boilers
(1) Check water level
(2) Drain gauge glass
(3) Check low water controls
(4) Check high water controls
(5) Blowdown water column
(6) Check surface blowdown
(7) Perform a bottom blowdown
(8) Check flame failure controls
(9) Perform a water analysis and treat accordingly
(10) Check fuel oil temperature and pressure
(11) Check fuel oil tank quantity and moisture
(12) Check steam/water temperature/pressure
(13) Check the feedwater temperature and pressure
(14) Check quantity of make-up water
(15) Check flue gas temperature and opacity
(16) Check burner operation
(17) Clean oil and water strainers
(18) Investigate any unusual operation or noise
f. Internal Building Layout, Plans, Diagrams
g. Specialty Equipment
h. Swimming Pools, Spas and Related Equipment
i. Preventive Maintenance
Perform preventive maintenance as scheduled on the following equipment:

- **(1) Air Compressors**
- **(2) Air Conditioners**
- **(3) Air Dryers**
- **(4) Cooling towers**
- **(5) Electrical Distribution**
- **(6) Fan coil units**
- **(7) Fire alarm systems**
- **(8) Heat pump**
- **(9) Pumps**
- **(10) Refrigeration equipment**

3. Organization of Facilities Care.....250
- **a. Building Interior**
- **b. Building Exterior**
- **c. Grounds, Parking Lots and Walkways**
- **d. Cleaning Standards/What is Clean?**
- **e. Cleaning Schedules**
- **f. Cleaning Frequency**
- **g. Time on Task/Time Management**

4. Cleaning Equipment and Supplies.....250
- **a. Safety**
- **b. Chemical and Material Selection, Handling and Storage**
- **c. Equipment Selection/Specifications**
- **d. Supply Selection/Stocking**
- **e. Spare Parts and Materials**
- **f. Preventative Maintenance**
- **g. Shipping, Receiving and Inventory**

5. Area Cleaning.....500
- **a. Entrance Ways, Hallways or Corridors**
- **b. Rooms, General**
- **c. Specialty Areas**
- **d. Restrooms**
- **e. Cafeteria and Food Preparation Areas**
- **f. Industrial Areas**
- **g. Swimming Pools, Spas and Related Exercise Equipment**
- **h. Showers and Locker Rooms**
- **i. Offices**
- **j. Trash and Refuse**

6. Surface Maintenance and Cleaning 1650
- **a. Floors and Floor Surfaces**
  - **(1) Resilient**
  - **(2) Hard Floors**
  - **(3) Floor Cleaning**
  - **(4) Carpets**

- **(5) Athletic Services**

b. Walls
- **(1) Internal**
- **(2) External**

c. Roofs
- **(1) Inspection**
- **(2) Cleaning**

d. Windows

e. Doors

f. Furnishings

7. Employment Relations and Communications.....600

a. People Skills

b. Conflict Resolution

c. Supervision/Evaluation

d. Communication and Reporting

e. Manpower Scheduling

f. Multi-Cultural Awareness

TOTAL HOURS: 4000

IX. RELATED/SUPPLEMENTAL INSTRUCTION:

The apprentice must attend related/supplemental instruction (RSI). Time spent in related/supplemental instruction shall not be considered as hours of work and the apprentice is not required to be paid for time spent in related/supplemental instruction.

The sponsor and training agent must provide for instruction of the apprentice during the related/supplemental instruction in safe and healthful work practices in compliance with the Washington Industrial Safety and Health Act, and applicable federal and state regulations.

Clock hours of actual attendance by the apprentice in related/supplemental instruction classes at the community/technical college or other approved training locations shall be reported to the Department on a quarterly basis. Such reports will clearly identify paid versus unpaid and supervised versus unsupervised RSI time for industrial insurance purposes.

For industrial insurance purposes, the WSATC will be considered as the employer should any supervised apprentice, not being paid to attend RSI, sustain an injury while participating in related/supplemental classroom activity, or other directly related activity outside the classroom. The activities must be at the direction of the instructor.

In case of failure on the part of any apprentice to fulfill the obligation to attend RSI, the sponsor has authority to take disciplinary action (see Administrative/Disciplinary Procedures section).

The methods of related/supplemental training must consist of one or more of the following (please indicate by checking those that apply):

(X) Supervised field trips

(X) Approved training seminars: **Industry and/or vendor sponsored seminars as approved by the JATC.**

( ) A combination of home study and approved correspondence courses (specify)

(X) State Community/Technical college

(X) Private Technical/Vocational college

(X) Training trust

( ) Other (specify)**:**

144 Minimum RSI hours per year defined per the following (see WAC 296-05-316(6)):

(**X**) twelve-month period from date of registration.*
( ) defined twelve-month school year: **(insert month)** through **(insert month)**.
( ) two-thousand hours of on the job training.

**If no selection is indicated above, the WSATC will define RSI hours per twelve-month period from date of registration.*

Additional Information:

A. The Committee recommends that the courses for Stationary Engineers be limited to those who are actually apprentices in the Stationary Engineer Trade in accordance with these Standards.
B. In the event an apprentice has completed all of their required RSI, but has less than the required OJT, the apprentice will not be required to attend further classes unless directed by the Joint Apprenticeship Training Committee.

X. ADMINISTRATIVE/DISCIPLINARY PROCEDURES:

Sponsors may include in this section requirements and expectations of the apprentices and training agents and an explanation of disciplinary actions that may be imposed for noncompliance. The sponsor has the following disciplinary procedures that they may impose: Disciplinary Probation, Suspension, or Cancellation.

Disciplinary Probation: A time assessed when the apprentice's progress is not satisfactory. During this time the program sponsor may withhold periodic wage advancements, suspend or cancel the apprenticeship agreement, or take further disciplinary action. A disciplinary probation may only be assessed after the initial probation is completed. During the disciplinary probation, the apprentice has the right to file an appeal of the sponsor's action with the WSATC (as described in WAC 296-05-009).

Suspension: A suspension is a temporary interruption in progress of an individual's apprenticeship program that may result in the cancellation of the Apprenticeship Agreement. Could include temporarily not being allowed to work, go to school or take part in any activity related to the Apprenticeship Program until such time as the sponsor takes further action.

Cancellation: Refers to the termination of an apprenticeship agreement at the request of the apprentice, supervisor, or sponsor. [as described in WAC 296-05-316(22)].

A. General Procedures

1. Apprentice progress will be reviewed every 1000 hours. Apprentices must complete at least 72 hours of related supplemental instruction every

six months of their apprenticeship term. All parties participating under the Standards may be asked for a report on each apprentice.

a. If the apprentice does not comply with the above rule, they may be placed on disciplinary probation. The Apprenticeship Committee will determine terms of the disciplinary probation.

b. The Apprenticeship Committee shall have the authority to withhold advancement, suspend, or cancel the Agreement for failure to comply but any action must conform to the appeal requirements. The Apprentice in question will receive a notice twenty (20) days prior to any hearing or meeting that would suspend or cancel their Agreement and at that time be invited to appear before the committee.

2. Periodic Evaluation and Work Progress Record Books:

a. Each apprentice will be furnished with a "Work Progress Record" which must be signed or initialed at the end of each month by the timekeeper, or Journeyperson supervising the apprentice. The record must be submitted to the Apprenticeship Training Committee Office no later than the fifth of the following month regardless if the apprentice is working or not.

b. If the apprentice violates the above rule three (3) times, they may be placed on disciplinary probation. The Apprenticeship Committee will determine terms of the probation.

c. The Apprenticeship Committee shall have the authority to withhold advancement, suspend, or cancel the Agreement for failure to comply but any action must conform to the appeal requirements. The Apprentice in question will receive a notice twenty (20) days prior to any hearing or meeting that would suspend or cancel their Agreement and be invited to attend any such hearing.

3. Licensing Requirements:

a. Facilities Custodial Engineer apprentices; proof of acquiring Grade 4 City of Seattle steam license must be on file prior to program completion.

b. Stationary Engineer apprentices; proof of acquiring Grade 3 City of Seattle steam license as well as a City of Seattle Refrigeration Operators license must be on file prior to program completion .

B. Local Apprenticeship Committee Policies

None

C. Complaint and Appeal Procedures:

All registered programs must establish procedures explaining the program's complaint review process. Complaints that involve matters covered by a collective bargaining agreement are not subject to the complaint review procedures in this section.

Complaint (after initial probation completed) – WAC 296-05-009 and 296-05-316(22)

Prior to: 20 calendar days of intention of disciplinary action by a sponsor

- Sponsors must notify the apprentice in writing of action to be taken
- Must specify the reason(s) for discipline, suspension, or cancellation
- Decision will become effective immediately
- Written reason(s) for such action must be sent to the apprentice

Within: 30 calendar days request for reconsideration from the sponsor

- Apprentice to request sponsor to reconsider their action

Within: 30 calendar days of apprentice's request for reconsideration

- Sponsor must provide written notification of their final decision

If apprentice chooses to pursue the complaint further:

Within: 30 calendar days of final action

- Apprentice must submit the complaint in writing to the Department
- Must describe the controversy and provide any backup information
- Apprentice must also provide this information to the local sponsor

Within: 30 business days for supervisor to complete investigation

- If no settlement is agreed upon during investigation, then supervisor must issue a written decision resolving the controversy when the investigation is concluded

If the apprentice or sponsor disputes supervisor decision:

Within: 30 calendar days of supervisor's decision, request for WSATC hearing

- Request must be in writing
- Must specify reasons supporting the request
- Request and supporting documents must be given to all parties
- WSATC must conduct the hearing in conjunction with the regular quarterly meeting

Within: 30 calendar days after hearing

- WSATC to issue written decision

XI. COMMITTEE – RESPONSIBILITIES AND COMPOSITION

NOTE: The following is an overview of the requirements associated with administering an apprenticeship committee and/or program. These provisions are to be used with the corresponding RCW and/or WAC.

The sponsor is the policymaking and administrative body responsible for the operation and success of this apprenticeship program. A committee is responsible for the day-to-day operations of the apprenticeship program and they must be knowledgeable in the process of apprenticeship and/or the application of chapter 49.04 RCW and chapter 296-05 WAC. Sponsors must develop procedures for:

A. Committee Operations (WAC 296-05-316): (Not applicable for Plant Programs) Convene meetings at least three times per year of the program sponsor and apprenticeship committee attended by a quorum of committee members as defined in the approved Standards. If the committee does not indicate its definition of quorum, the interpretation will be "50% plus 1" of the approved committee members. Conference call meetings may be conducted in lieu of regular meetings but must not exceed the number of attended meetings and no disciplinary action can be taken during conference call meetings.

B. Program Operations (Chapter 296-05 WAC - Part C & D):

1. The program sponsor will record and maintain records pertaining to the administration of the apprenticeship program and make them available to the WSATC or Department on request.

   Records required by WAC 296-05-400 through 455 (see Part D of chapter 296-05 WAC) will be maintained for five (5) years; all other records will be maintained for three (3) years.

2. The sponsor will submit to the Department through the assigned state apprenticeship consultant the following list:

   Forms are available on line at http://www.lni.wa.gov/TradesLicensing/Apprenticeship/FormPub/default.asp or from your assigned apprenticeship consultant.

   - Apprenticeship Agreements – within first 30 days of employment
   - Authorization of Signature forms - as necessary
   - Approved Training Agent Agreements (sponsor approving or canceling) – within 30 days

- Minutes of Apprenticeship Committee Meetings – within 30 days of meeting (not required for Plant program)
- Request for Change of Status - Apprenticeship/Training Agreement and Training Agents forms – within 30 days of action by sponsor.
- Journey Level Wage Rate – annually, or whenever changed
- Request for Revision of Standards - as necessary
- Request for Revision of Committee - as necessary
- Related Supplemental Instruction (RSI) Hours Reports (Quarterly):
  1st quarter: January through March, by April 10
  2nd quarter: April through June, by July 10
  3rd quarter: July through September, by October 10
  4th quarter: October through December, by January 10
- On-the-Job Work Hours Reports (bi-annual)
  1st half: January through June, by July 30
  2nd half: July through December, by January 31

3. The program sponsor will adopt, as necessary, local program rules or policies to administer the apprenticeship program in compliance with these Standards that must be submitted for Department approval and updating these Standards. The apprenticeship program manager may administratively approve requests for revisions in the following areas of the Standards:
   - Program name
   - Sponsor's introductory statement (if applicable)
   - Section III: Conduct of Program Under Washington Equal Employment Opportunity Plan
   - Section VII: Apprentice Wages and Wage Progression
   - Section IX: Related/Supplemental Instruction
   - Section XI: Committee - Responsibilities and Composition (including opening statements)
   - Section XII: Subcommittees
   - Section XIII: Training Director/Coordinator

4. The sponsor will utilize competent instructors as defined in WAC 296-05-003 for related/supplemental instruction. Furthermore, the sponsor will ensure each instructor has training in teaching techniques and adult learning styles, which may occur before or within one year after the apprenticeship instructor has started to provide instruction.

C. Management of Apprentices:

1. Each apprentice (and, if under 18 years of age, the parent or guardian) will sign an apprenticeship agreement with the sponsor, who will then register the agreement, with the Department before the apprentice attends the related/supplemental instruction classes, or within the first 30 days of employment as an apprentice. For the purposes of industrial insurance coverage and prevailing wage exemption

under RCW 39.12.021, the effective date of registration will be the date the agreement is received by the Department.

The Department must be notified within 30 days of program approval, of all requests for disposition or modification of agreements, with a copy of the minutes approving the changes, which may be:

- Certificate of completion
- Additional credit
- Suspension (i.e. military service or other)
- Reinstatement
- Cancellation and/or
- Corrections

2. Rotate apprentices in the various processes of the skilled occupation to ensure the apprentice is trained to be a competent journey-level worker.

3. Periodically review and evaluate apprentices before advancement to the apprentice's next wage progression period. The evidence of such advancement will be the record of the apprentice's progress on the job and during related/supplemental instruction.

4. The sponsor has the obligation and responsibility to provide, insofar as possible, continuous employment for all apprentices in the program. The sponsor may arrange to transfer an apprentice from one training agent to another or to another sponsor when the sponsor is unable to provide reasonably continuous employment, or they are unable to provide apprentices the diversity of experience necessary for training and experience in the various work processes as stated in these Standards. The new sponsor or training agent will assume all the terms and conditions of these Standards. If, for any reason, a layoff of an apprentice occurs, the apprenticeship agreement will remain in effect unless canceled by the sponsor.

5. An apprentice who is unable to perform the on-the-job portion of apprenticeship training may, if the apprentice so requests and the sponsor approves, participate in related/supplemental instruction, subject to the apprentice obtaining and providing to the sponsor written requested document/s for such participation. However, time spent will not be applied toward the on-the-job portion of apprenticeship training.

6. Hear and adjust all complaints of violations of apprenticeship agreements.

7. Upon successful completion of apprenticeship, as provided in these Standards, and passing the examination that the sponsor may require, the sponsor will recommend that the WSATC award a Certificate of Completion of Apprenticeship. The program will make an official presentation to the apprentice that has successfully completed his/her term of apprenticeship.

D. Training Agent Management:

1. Offer training opportunities on an equal basis to all employers and apprentices. Grant equal treatment and opportunity for all apprentices through reasonable working and training conditions and apply those conditions to all apprentices uniformly. Provide training at a cost equivalent to that incurred by currently participating employers and apprentices. Not require an employer to sign a collective bargaining agreement as a condition of participation.

2. Determine the adequacy of an employer to furnish proper on-the-job training in accordance with the provisions of these Standards. Require all employers requesting approved training agent status to complete an approved training agent agreement and comply with all federal and state apprenticeship laws and the appropriate apprenticeship Standards.

3. Submit approved training agent agreements to the Department with a copy of the agreement and/or the list of approved training agents within thirty days of committee approval. Submit rescinded approved training agent agreements and/or the list of approved training agents to the Department within thirty days of said action.

E. Composition of Committee: (see WAC 296-05-313)

Apprenticeship committees must be composed of an equal number of management and non-management representatives composed of at least four members but no more than twelve. If the committee does not indicate its definition of a quorum, the interpretation will be "50% plus 1" of the approved committee members.

Apprenticeship committees shall elect a chairperson and a secretary who shall be from opposite interest groups, i.e., chairperson-employers; secretary-employees, or vice versa; EXCEPT, this does not apply where the Registration Agency represents the apprentice(s).

For plant programs the WSATC or the Department designee will act as the employee representative.

Quorum: **SEE ABOVE**

Program type administered by the committee: **Individual Joint**

The Apprenticeship Committee will be composed of at least six (6) members; three (3) members representing the employers of Stationary Engineers and three (3) members representing the International Union of Operating Engineers, Local 609, each side having equal numbers.

The employer representatives shall be:

Pat Chan, Secretary
Seattle Public Schools
MS 23-365
PO Box 34165
Seattle, WA 98124-1165

Steve Stacey
Seattle Public Schools
MS 23-365
PO Box 34165
Seattle, WA 98124-1165

Bruce Skowyra
Seattle Public Schools
MS 23-365
PO Box 34165
Seattle, WA 98124-1165

The employee representatives shall be:

Mike McBee, Chairperson
IUOE Local 609
2800 1st Ave, Rm 311
Seattle, WA 98121

David Westberg
IUOE Local 609
2800 1st Ave, Rm 311
Seattle, WA 98121

Cornelius T. Carroll
Seattle Public Schools
PO Box 34165, MS 23-365
Seattle, WA 98124-1165

XII. SUBCOMMITTEE:

Subcommittee(s) approved by the Department, represented equally from management and non-management, may also be established under these Standards, and are subject to the main committee. All actions of the subcommittee(s) must be approved by the main committee.

None

XIII. TRAINING DIRECTOR/COORDINATOR:

The sponsor may employ a person(s) as a full or part-time training coordinator(s)/training director(s). This person(s) will assume responsibilities and authority for the operation of the program as are delegated by the sponsor.

Cornelius (Ted) Carroll, Coordinator
MS 23-365
PO Box 34165
Seattle, WA 98124-1165