Recommendations for Consideration by the Federal Advisory Council on Occupational Safety and Health (F ACOSH) on the Federal Buildings Personnel Training Act of 2010

Prepared by the Federal Advisory Council on
Occupational Safety and Health
(FACOSH)
Training Subcommittee

On May 3,2012, FACOSH approved the recommendation in this report and adopted the report.

EXECUTIVE SUMMARY

In the fall of 2010, the Federal Advisory Council on Occupational Safety and Health (FACOSH) tasked its Training Subcommittee with assessing the Occupational Safety and Health training needs of Federal workers. in December 2010, the Federal Buildings Personnel Training Act (FBPTA) was passed to ensure that core competencies and appropriate training are identified for personnel responsible for the design, function, operation, and maintenance of Federal buildings. The Act directed the General Services Administration (GSA) to work with relevant group in identifying these core competencies; as well as courses, certifications, and other means of demonstrating competence. These core competencies include safety, energy management, and building design. The law also requires contractors working in federal buildings to provide training and to demonstrate identified core competencies.

The law represented an ideal opportunity for Federal safety and health experts to bring their knowledge to this effort to ensure that safety and health training is integrated into building operation, renovation, and maintenance. FACOSH passed a motion at the June 2011 meeting recommending that the Secretary of Labor direct OSHA, in conjunction with NIOSH, to identify and convene a panel of federal agency personnel with expertise in the areas related to building operations, maintenance, safety, and design. The panel was to work with GSA on identifying the core competencies, appropriate training, and continuing education as described in the FBPTA.

In response, an FBPTA Workgroup was formed under the auspices of the FACOSH Training Subcommittee. The group developed safety and health core competencies for three building-related positions identified by GSA. The competencies are listed in the Appendix B tables.

ISSUES

The safety and health core competencies are being presented to FACOSH at the May 2012 meeting, and any FACOSH suggestions or input can be incorporated in an expedited manner. The FBPTA included dates for implementation and it requires GSA to make information on core competencies available in June of 2012. Expedited approval and transmittal of the core competencies is needed in order to make sure that they are incorporated.

RECOMMENDATIONS

FACOSH should review and approve this core competencies report and recommend that the Secretary of Labor transmit it to the current head of GSA so that it can be considered by GSA as part of their activities to respond to the statutory requirements of the FBPT A. Because the FBPTA includes a June 2012 deadline for initial listing of core competencies, FACOSH recommends that the transmittal process be expedited and/or that the Assistant Secretary transmit the report as soon as possible after the May FACOSH meeting.

BACKGROUND AND REPORT FROM THE FACOSH FBPTA WORKGROUP

Safety is a major concern for workers who operate and maintain buildings. The Bureau of Labor Statistics (BLS) provides the (following work environment description for stationary engineers:

> "Some stationary engineers and boiler operators are exposed to high temperatures, dust, dirt, and Loud noise from the equipment. Maintenance duties also may require contact with oil, grease, and smoke. Workers spend much of their time on their feet. They also may have to crawl inside boilers and work while crouched or kneel to inspect, clean, or repair equipment. Stationary engineers and boiler operators have a much-higher-than-average rate of occupational injuries and illnesses. Because they work around hazardous machinery, they must follow procedures to guard against burns, electric shock, noise, dangerous moving parts, and exposure to hazardous materials." *(BLS Occupational Outlook Handbook at http://www.bls.gov/ooh/Production/Stationary-engineers-and-boiler-operators.htm#ab-3)*

The FBPTA workgroup developed a list of Occupational Safety and Health (OSH) competencies for 3 building-related positions identified by GSA as central to FBPTA implementation:

1) Operating Engineer/Building Technician[1]
2) Facility Manager; and
3) Sustainability Manager (to be developed from the current Energy Manager position).

The workgroup used Job Task Analyses (JTAs) developed by DOE in partnership with GSA for these job titles to identify potential hazards and exposures. GSA indicated these . JTAs would be used to help meet FBPTA requirements. OSH competencies were identified based on the tasks and duties listed in the JTA and were considered from 3 perspectives:

1) Safe work: competency needed by the employee to work safely
2) Safe facility: competency needed by the employee to minimize hazards to other workers and occupants
3) Safety Management: competency needed to manage safety and health

For example, the Operating Engineer/Building Technician JTA mentions the use of lockout/tagout for 23 different steps. thus indicating that knowledge of 1910.147 (Control of Hazardous Energy) is needed as a safety competency for this occupation.

The workgroup developed a table for each of the three building-related positions. The table lists each OSH competency, specific JTA tasks that provide the basis for the competency, along with relevant federal requirements and other consensus standards and best practices relevant to the competency.

[1] Note that operating engineers working in buildings are also called stationary engineers. The term operating engineer can also be used to describe individuals operating construction equipment such as cranes or bulldozers but this type of construction equipment operation was considered outside of the scope for review.

The focus in the tables on federal requirements relates to the FBPT A language targeting core competencies necessary to "comply with requirements under Federal law". Other consensus standards or guidance were also included since this is relevant to FBPTA language that continuing education be developed to ensure operation of Federal buildings in accordance with "industry best practices and standards".

Competencies were grouped 'into categories (e.g. Safety, Health, and Management). The tables also include a link to the specific JTA examined. Draft tables were reviewed with the FACOSH Training Committee on 4/4/12.

GSA provided draft core competencies for Facility Managers on April 11, 2012 to federal stakeholders participating in the FBPTA process. These were provided to the FACOSH FBPTA workgroup. The email indicated that proposed competencies tor Building Operators and Sustainability Managers are to follow.

GSA described a career ladder approach and divided the Facility Manager position into three different levels:

Junior (OS 7-11)	12 Overall competencies
Mid-Grade (GS 12-13)	17 Overall competencies
Senior (GS 14-15)	17 Overall competencies

In each case, most safety competencies were included in the competency titled: *Safety, Security, Emergency Management.*

For example, the draft Safety, Security, and Emergency Management Competencies for the junior grade Facility Manager are:

> *a) Demonstrate understanding of, and be fully qualified under your Agency's Safety Program and OSHA as it relates to your job.*
> *b) Demonstrate understanding of your role in the following: fire alarm and system certifications, ire drills; evacuation drills, routes and procedures; life safety drills; HAZMAT drills; emergency power and operations procedures; Natural disaster procedures and Occupant Emergency Plans.*
> *c) Demonstrate knowledge emergency contact numbers and information.*
> *d) Demonstrate appropriate level of knowledge of physical and cyber security issues and how your job impacts and is affected by them.*[2]

These draft safety and health competencies are very general. The specific safety and health core competencies developed by the FBPTA workgroup should provide GSA with important information and input to allow the FBPTA to provide more meaningful and comprehensive coverage of safety as a true core competency. Expedited transmittal via FACOSH and the Department of Labor is recommended.

[2] Page 9 of *Federal Building Personnel Training Act Core Competencies for Facility Managers:* Draft Proposed Core Competencies, April 5, 2012.

APPENDIX A

The following list contains the names of the individuals who participated on the F ACOSH FBPTA Workgroup during its review of safety and health core competencies.

Workgroup Co-Chairs

Matt Gillen,	Deputy Director Office of Construction Safety and Health National Institute for Occupational Safety and Health (NIOSH)
Bruce Zaczynski	Safety and Occupational Health Programs Manager National Archives & Records Administration

Members

Catherine Beaucham	Industrial Hygienist, NIOSH
Jean Cox-Ganser	Research Team Supervisor, NIOSH
Donna Heidel,	Prevention through Design Program Coordinator, NIOSH
Jamar Jackson,	Occupational Health and Safety Specialist, EPA
Janet Lamond,	National Audit Program Manager- Industrial Hygienist, EPA
Lewis Ligon,	Industrial Hygienist, OSHA Office of Federal Agency Programs
David Marciniak,	Safety and Health Manager, GSA Public Buildings Service
Ross Mowery,	Fire Protection Engineer, EPA
David Smith,	Department of Energy
Chu Tran,	Assistant Director, Department of Justice Environmental and Sustainability Services
David Wynn,	Industrial Hygienist, EPA

OSHA Staff

Mandi Garner, Office of Federal Agency Programs, OSHA

APPENDIX B

1) Occupational Safety and Health Core Competencies for
OPERATING ENGINEER/BUILDING TECHNICIAN

2) Occupational Safety and Health Core Competencies for
FACILITY MANAGER

3) Occupational Safety and Health Core Competencies for
SUSTAINABILITY MANAGER

FACOSH FBPTA Workgroup Review Occupational Safety and Health Core Competencies for: FACILITY MANAGER			
1) COMPETENCIES BASED ON JTA DESCRIPTION http://www1.eere.energy.gov/buidings/commercial_initiative/pdfs/facility_manager_ita_comment.pdf			
Specialized Safety &Health knowledge needed	**Relevant to these Duties/Task/Steps**	**Relevant Federal Regulations**	**Other relevant Best Practice or Consensus or Agency Standard**
SAFETY COMPETENCIES			
Safety knowledge equivalent to that for Operating Engineer/ Building Technician	Facility Manager needs these competencies for both safe work and a safe facility. **See Operating Engineer/Building Technician (OE/BT) listing for applicable competencies, duties, relevant federal regulations, and other relevant best practices or agency standards.** List of those OE/BT competencies includes: lockout/tagout, Safe work at heights, Machine injury awareness, Electrical Safety, Confined Space Safety		
HEALTH HAZARD COMPETENCIES			
Health Hazard knowledge equivalent to that for Operating Engineer/Building Technician	Facility Manager needs these competencies for both safe work and a safe facility. **See Operating Engineer/Building Technician (OE/BT) listing for applicable competencies, duties, relevant federal regulations, and other relevant best practices or agency standards.** List of those OE/BT competencies includes: Personal Protective Equipment, Hazard Communication, Spill Clean-up, Noise and Hearing Protection, Mold awareness, legionella awareness, Refrigerant (CFC) awareness, Heat and Cold Stress awareness, lead awareness, PCB awareness, Asbestos awareness, Musculoskeletal disorder awareness.		
LIFE SAFETY AND SECURITY COMPETENCIES			
Management of Fire Protection and life Safety (Hazards, systems, maintenance, testing. Hot work (e.g. use of torches), flammable storage, and fire watch.)	Management and safe facility: Duties related to management: A4) Access Control A6) Fire and Life Safety Systems A7) Preventive Maintenance A9) Building Systems	All of Subpart l: Fire Protection (e.g. Fire detection systems, employee alarm systems, automatic sprinkler systems) 1910.106(b) Flammable and Combustible liquids	NFPA 72: National Fire Alarm & Signaling code NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection NFPA 25: Standard for Inspection, Testing, & Maintenance of Water-Based Fire Protection Systems. NFPA 13; Standard for Installation of Sprinkler Systems. NFPA 80: Standard for Fire Doors and Other Opening Protectives NFPA 102: Standard for Smoke Door Assemblies and other Opening Protectives NFPA 22: Standard for Water Tanks for Private Fire Protection NFPA 101: Life Safety Code Test procedures/protocol as determined by local Authority Having

			Jurisdiction. Local Building and Fire Prevention Codes
Occupant Emergency Plans and Continuity of Operations Plans (Developing, implementing, and maintaining emergency plans)	Management and safe facility. Tasks suggesting the need for this include: AS" Manage Security Systems"	National Security Presidential Directive-51/Homeland Security Presidential Directive-20 (NSPD-51/HSPD-20)	GSA Guide: Occupant Emergency Plans: Development, Implementation, and Maintenance http://www.gsa.gov/graphics/pbs/OEP_Guide.pdf FEMA Continuity of Operations web page guidance http://www.fema.gov/about/org/ncp/coop/index.shtm
SAFETY AND HEALTH MANAGEMENT COMPETENCIES			
General Facility Occupational Safety and Health Management (-Safety and health hazards faced by building operations and maintenance employees -OSH management -Accident investigation and basic hazard and risk evaluation -How to develop basic health and safety procedures -OSHA record keeping forms -Federal Safety and Health professional resources -Safety training topics -Workers Compensation requirements -OSH program requirements (hearing protection, respiratory protection, fall protection, etc.)	Management and safe facility. Tasks suggesting the need for this include: A1 "Safety Requirements" A7 "Conduct a job/hazard assessment for the task" C1"Manage Safety Programs" C3 "Develop a HAZMAT reduction strategy" Also, Pg. 16 lists "training skills"	Part 1904- Recording and Reporting Occupational Injuries and Illness Part 1960 - Basic Program Elements for Federal Employees	

Building Services hazards, safe practices, and management (-Landscaping hazards -Janitorial hazards and cleaning chemicals. Effects on workers and IAQ -Pesticide hazards and effects on applicators and IAQ -Motor vehicle hazards arid safe practices)	Management and safe facility. The A10 tasks suggesting the need for this include: b) Manage landscaping (and grounds) program e) Manage janitorial program h) Manage Pest Control program i) Manage Facility fleet	See EPA http://www.epa.gov/oppfead1/safe/ty/applicators/privcomm.htm For rules and references to state laws for pesticide applicators	NIOSH :Fatal Injuries among Landscape Services Workers http://www.cdc.gov/niosh/docs/2008-144/ http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6017a3.htm?s_cid=mm6017a3_w See OSHA Topic page http://www.osha.gov/dcsp/products/topics/cleaning industry/standards.html See EPA guidance: Greening your purchase of Cleaning products http://www.epa.gov/epp/pubs/cleaning.htm
Construction and Renovation hazards and safe practices (-Knowledge on how to plan a safe renovation. -Knowledge on renovation-related "Prevention through Design" (e.g. using roof repair to have permanent anchors for fall prevention installed) -Knowledge on how to monitor project safety and health -Knowledge on potential for renovation to affect indoor air quality and practices to minimize this.)	Management and safe facility. The following tasks suggesting the need for this include: C 4 b: "Manage tenant build outs" D 1: "Initiate a Facility Project D 2 d: "Manage impacts of project on existing facility"	1926 standards for Construction	Building Air Quality A Guide for Building Owners and Facility Managers http://www.epa.gov/iaq/largebldgs/baq_page.htm
Sustainable Program Management (Integration of OSH into green practices) *(NOTE: Extent of responsibility depends on how much is shared with Sustain ability Manager)*	Management and safe facility. The tasks suggesting the need for this C3 duty (Manage Sustainable Programs) includes the following: e) Develop green procurement program g) Develop HAZMAT reduction strategy r) Develop a green cleaning program		

2) COMPETENCIES BASED ON TOPICS/TASKS NOT DIRECTLY MENTIONED IN THE JTA			
IAQ awareness (A variety of building operations and maintenance practices and conditions can adversely affect IAQ for building occupants)	Relates to Duty A9 d Manage mechanical systems (HVAC, plumbing, etc.)		Building Air Quality A Guide for Building Owners and Facility Managers http://www.epa.gov/iaq/largbldgs/baq_page.htm
Specialized Core Competencies: Laboratories (Facilities that include labs will require additional specialty competencies related to common lab safety issues such as: mercury, radionuclides, maintenance of safety showers, lab hoods, and toxicants that could be introduced into the ventilation system from lab operations.)	Safe work, management, and safe facility. lab operations affect numerous building systems and maintenance issues.	1910.450 Occupational Exposure to Hazardous Chemicals in laboratories	*ANSI Z358.1-2004,* Emergency Eyewash and Shower Equipment *ANSI Z9.5-2003,* laboratory Ventilation NFPA 45: Standard on Fire Protection for laboratories Using Chemicals OSHA laboratory Safety Guidance http://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf
Specialized Core Competencies: Green and Vegetated roofs (Facilities that include green and vegetated roofs involve additional safety management duties to assure safe access and arrangements for fall prevention.)	Safe work, management, and safe facility. Green and vegetated roofs require maintenance. Fall prevention arrangements and procedures are needed to assure safe access and safe work. *(NOTE: Vegetated roof maintenance may be contracted out)*	1910.23 Walking Working surfaces 1926 Subpart M Fall Protection	
Specialized Core Competencies: Solar installations (Facilities that include solar installations involve additional safety management duties to assure safe access, safe electrical work, and arrangements for fall prevention.)	Safe work, management, and safe facility. Solar installations require maintenance. Fall prevention and electrical safety procedures and arrangements are needed to assure safe access and safe work *(NOTE: Solar installation maintenance may be contracted out)*	1910.23 Walking Working Surfaces 1926 Subpart M Fall Protection 1910 Subpart S Electrical 1926 Subpart K Electrical	
Specialized Core Competencies: Wind power installation (Facilities that include wind power installation involve additional safety management duties to assure safe access, safe electrical and confined	Safe work, management, and safe facility. Wind power installations require maintenance. Fall prevention, and safe electrical and confined space procedures and arrangements are needed to assure	1910.23 Walking Working Surfaces 1926 Subpart M Fall Protection 1910 Subpart S Electrical 1926 Subpart K Electrical	

space work, and arrangements for fall prevention.)	safe access and safe work *(NOTE: wind power maintenance likely* to *be contracted out)*		
Specialized Core Competencies: Forklifts (Facilities that use forklifts involve additional safety management duties to assure safe use.)	Management Ensure forklift driver training every 3 years	1910.178	

FACOSH FBPTA Workgroup Review
Occupational Safety and Health Core Competencies for: SUSTAINABILITY MANAGER

1) COMPETENCIES BASED ON JTA DESCRIPTION http://www1.eere.energy.gov/buildings/commercial_initiative/pdfs/energy_manager_ita_comment.pdf

Specialized Safety & Health knowledge needed	Relevant to these Duties/Tasks/Steps	Relevant Federal Regulation(s)	Other relevant Best Practice or Consensus or Agency standard
SAFETY COMPETENCIES			
Safe work at Heights (Ladder safety, Scaffold safety, Roof safety, use of harnesses and lifelines)	Safe work B1 (Performing Sustainability Audit and B2 (Performing Energy Audit) mention ladder use. (P 16 mentions work while standing on portable ladders, standing on scaffolding, and sitting or standing on high roofs, overhangs, or I-beams. It also mentions work at heights of 1-25 feet and 26-75 feet above ground.)	1910.25 Portable wooden ladders 1910.26 Portable metal ladders 1910.28 Safety requirements for scaffolding 1926.104 Safety Belts, lifelines, and lanyards	
Electrical Safety awareness (Safe work in proximity to high voltage)	Safe work (P16 mentions work around or near high voltage power sources or equipment.)	1910 Subpart S Electrical	Other NEC or NFPA consensus standards in effect such as NFPA 70E arc flash code
Confined Space hazards and Procedures (Hazards and Precautions)	Safe work (P16 mentions work in confined spaces.)	1910.146 Permit-required confined spaces	
HEALTH HAZARD COMPETENCIES			
Personal Protective Equipment including Respirators (Selection, use, fit, maintenance)	Safe work B1 (Performing Sustainability Audit) and B4 (Perform Universal Waste Audit) mention PPE. (P 16 mentions work in dust, oils, fumes, or smells; work with or near fiberglass and asbestos; and work while wearing protective equipment such as respirators and hoods.)	1910.132 PPE General Requirements 1910.135-138 1910.134 Respiratory Protection	
Hazard Communication (Chemical toxic substance hazards)	Safe work B1 Performing Sustainability Audit mentions MSDS P16 mentions work in dust, oils, fumes or	1910.1200 Hazard Communication	

	smells, work with or near fiberglass and asbestos		
Noise and Hearing Protection (Use of PPE)	Safe work (P16 mentions work in noisy places (85decibels or higher with ear protection)	1910.95 Occupational Noise Exposure	
Asbestos awareness (Health effects, presence in building materials, understanding how disturbance can occur, and precautions)	Safe work and safe facility (P16 mentions work with or near asbestos materials)	1910.1001 Training requirements at 1910.1001(i)(7) 1926.1101 Asbestos	
Heat and Cold stress awareness	Safe work (P16 mentions work in low temperatures (0 to 45 degrees F) and high temperatures (85-130 degrees F))		See NIOSH heat stress guidance at http://www.cdc.goc/niosh/topics/heatstress/ and OSHA cold stress guidance at http://www.osha.gov/SLTC/emergencypreparedness/guides/cold.htm
2 - COMPETENCIES BASED ON TOPICS/TASKS NOT DIRECTLY MENTIONED IN THE JTA			
Health and Safety awareness and evaluation skills (To evaluate and address safety and health hazards that may be associated with sustainable building features such as vegetative roofs, solar installations on roofs, etc.)	Safe facility Add new task to B) Performing Site Audits: "Perform Occupational Safety and Health Audit" Alternatively, add new Step titled: "Evaluate occupational safety and health aspects" to: B1, B2, B3, B4,		
IAQ awareness (How certain ventilation and energy conservation practices could adversely affect IAQ for building occupants)	Safe facility Specialized knowledge related to D) Improving Energy Efficiency and Sustainability		Building Air Quality A Guide for Building Owners and Facility Managers http://www.epa.gov/iaq/largebldgs/baq_page.htm
SAFETY AND HEALTH MANAGEMENT COMPETENCIES			
Safe Construction and Renovation awareness, planning and safe practices (-Knowledge of how renovation	Management and Safe facility Add new task to D7) Plan for New Construction: “Evaluate potential		

can affect maintenance workers and occupants and how to plan a safe renovation.) -Knowledge on renovation-related "Prevention through Design" (e.g. using a roof repair project to have permanent anchors for fall prevention installed) - Knowledge on how to monitor project safety and health - Knowledge on potential for renovation to affect indoor air quality and practices to minimize this. *(NOTE: Extent of responsibility depends on how much is shared with Facility Manager)*	construction-related renovation hazards and develop project requirements to address them" (Add new task: "Participate in design discussions to address potential for hazard elimination/reduction".		
Sustainable Program Management Integration of OSH into green practices) *(NOTE: Extent of responsibility depends on how much is shared with Facility Manager)*	Management and safe facility. The tasks suggesting the need for this C3 duty (Manage Sustainable Programs) includes the following: e) Develop green procurement program g) Develop HAZMAT reduction strategy r) Develop a green cleaning program		

FACOSH FBPTA Workgroup Review
Occupational Safety and Health Core Competencies for: OPERATING ENGINEER/BUILDING TECHNICIAN

1) COMPETENCIES BASED ON JTA DESCRIPTION

http://www1.eere.energy.gov/buildings/commercial_initiative/pdfs/energy_manager_ita_comment.pdf

Specialized Safety & Health knowledge needed	Relevant to these Duties/Tasks/Steps	Relevant Federal Regulation(s)	Other relevant Best Practice or Consensus or Agency standard
SAFETY COMPETENCIES			
Lockout/tag out (LOTO) (Awareness and ability to use LOTO)	Safe work: LOTO is mentioned in the following B3, 5,6,7,8,10,11,12,14,15,16,17,22; C8,9,11; E6,7,8,9,10; F7,9 (Also mentioned on p11)	1910.147 Control of Hazardous Energy Training requirement at 1910.47(c)(7)	
Safe work at heights (Ladder safety, scaffold safety, roof safety, aerial lifts, use of harnesses and lifelines)	Safe work: Ladder use is mentioned in Bl,2,3,5,10; C2,12; D2; E13,4,5,7; H,5, 7; Gl, 5 (P16 - mentions work at heights of 1 to 25 feet above ground or floor) (Scaffolds are not mentioned in Table 8: but they are mentioned on page 16 and could be used for same ladder tasks) Work at heights or on roofs mentioned at B5,6; C2; G2 (Powered aerial platforms are not mentioned but they are commonly used for atria and exterior work)	1910.25 Portable wooden ladders 1910.26 Portable metal ladders 1926.1053 Ladders 1910.28 Safety requirements for scaffolding 1926 Subpart L Scaffolds 1910.23 Walking Working Surfaces 1926.104 Safety Belts, lifelines, and lanyards 1910.67 Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms 1926.453 Aerial Lifts	1926 Subpart M Fall Protection NFPA 780: Standard for Installation of Lightening Protection Systems
Machine injury awareness (Machinery hazards, burns, belt guards and precautions for removing guards and working around machinery)	Safe work: Tasks suggesting the need for this include B20, C 11	1910.212 General machine guarding requirements	
Electrical Safety (Including hazardous (classified) locations)	Safe work and safe facility: Tasks suggesting the need for this include E1-10	1910 Subpart S Electrical	Other NEC or NFPA consensus standards in effect such as NFPA 70E arc flash code
Confined Space Safety (Hazards and precautions for safe entry)	Safe work: Various tasks in B, C, and F (P16 mentions work in confined spaces)	1910.146 Permit-required confined spaces	

HEALTH HAZARD COMPETENCIES			
Noise and Hearing Protection (Including use of controls and PPE)	Safe work: D2, Various throughout (P16 refers to work in noisy places (85 decibels or higher with ear protection)	1910.95 Occupational Noise Exposure	
Personal Protective Equipment including Respirators (selection, use, fit, maintenance)	Safe work: PPE mentioned in B1,2,3,4,5,6, 7,8,9,10,11,12,14,15,16,17,19,20,21,22; C2,3,4,5,6,8,9,10,11,12; D3,8; E1,3,4,5,6,7,8,9,10; Fl,2,3,4,5,6,7; G2,3,5,6 Respirators mentioned in B2, 4,5,6, 12, 21; C2,4, 6; F2 5; G6, (Pg. 16 mentions work in dusts, oils, fumes; and respirators and hood use)	1910.132 PPE General Requirements 1910.135-138 1910.134 Respiratory Protection	
Hazard Communication (Chemical hazards, including H2S from sewage injectors, and use of MSDS and SDS)	Safe work and Safe facility: MSDS's mentioned in B4, 12,15,19; F5	1910.1200 Hazard Communication	
Mold awareness (Health effects, precautions and controls to protect O&M workers and occupants)	Safe work and Safe facility: Tasks suggesting the need for this include: B1,2,3,4,5,6,11; C11		- NIOSH Guidance: Preventing Occupational Respiratory Disease from Exposures caused by Dampness in Office Buildings, Schools, and Other Nonindustrial Buildings. http://www.cdc.gov/niosh/docket/review/docket238/pdfs/05-IEQ-ALERT-3-30-11.pdf - EPA Guidance: Mold Remediation in Schools and Commercial Buildings http://www.epa.gov/mold/pdfs/moldremediation.pdf
Legionella awareness (Health effects, precautions and measures to protect building technicians and occupants)	Safe work and Safe Facility: Tasks suggesting the need for this include B5, 6		-The American Society of Heating, Refrigerating and Air-Conditioning Engineers' ASH RAE Guideline 12-2000, Minimizing the Risk of Legionellosis Associated with Building Water Systems -ASH RAE Standard 188: Prevention of Legionellosis Associated with Building Water Systems (to be released in summer of 2012)

Spill Clean up (Serving as "first responder" for chemical spills - Knowledge of counter spill & clean-up operations, including for diesel fuel)	Safe work and Safe facility: Tasks suggesting the need for this include: B4, 12, 15, 19; F5	1910.120 (e) Hazardous Waste Operations and Emergency Response	
Refrigerant (CFC) awareness (Refrigerant hazards and procedures)	Safe work and Safe facility	EPA CFR 82.161 certification for technicians.	
Heat and Cold stress awareness	Safe work: Various tasks. (P16 states that tasks include work in high temperatures (85-130F) and low temperatures(0-45F))		See NIOSH heat stress guidance at http://www.cdc.gov/niosh/topics/heatstress/ and OSHA cold stress guidance at http://www.osha.gov/SLTC/emergencypreparedness/guides/cold.htm
Lead awareness (Lead in old solder, other uses of lead in buildings; non-lead solder alternatives)	Safe work and safe facility: Various repair tasks (P17 lists brazing and soldering equipment)	1910.1025 Lead	1926.62 Lead (Potential upcoming requirements related to EPA Renovation, Repair, and Painting Program for Public and Commercial Buildings: see http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2010-0173-0001;oldLink=false
PCB awareness (Presence in old ballasts, transformers, and window caulks)	Safe work and Safe facility: Tasks suggesting the need for this include: El,4,5; G5	See EPA PCB spill and disposal regulations at http://www,epa.gov/epawaste/hazard/tsd/pcbs/pubs/laws.htm	EPA Proper Maintenance, Removal, and Disposal of PCB-Containing Fluorescent Light Ballasts http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/ballasts.htm EPA PCBs in Caulk in Older Buildings http://www.epa.gov/pcbsincaulk/ EPA Contractors: Handling PCBs in Caulk During Renovation http://www.epa.gov/pcbsincaulk/caulkcontractors.htm
Asbestos awareness (Health effects and presence in older building components such as boiler and pipe insulation, gaskets, floor tiles, and sound and heat proofing materials. Understanding how disturbance can occur and safe work procedures.)	Safe work and Safe facility: Tasks suggesting the need for this include: B12 and others	1910.1001 Training requirements at 1910.1001(i)(7)	1926.1101 Asbestos EPA Managing Asbestos in Place: How to Develop and Maintain a Building Asbestos Operations and Maintenance (O&M) Program http://www.epa.gov/asbestos/pubs/management_in_place.html

Musculoskeletal Disorder awareness	Safe work: Various tasks. (P16 mentions lifting 100 pounds maximum, and working with hands and arms over head level.)		OSHA 2250: Principles of Ergonomics applied to Work-Related Musculoskeletal and Nerve Disorders
LIFE SAFETY AND SECURITY COMPETENCIES			
Fire Protection and Life Safety (Hazards, systems, maintenance, testing. Hot work (e.g. use of torches), flammable storage, and fire watch.)	Safe work and safe facility: D1-8 (P19 mentions torch use)	All of Subpart L: Fire Protection (e.g. Fire detection systems, employee alarm systems, automatic sprinkler systems) 1910.106(b) Flammable and Combustible liquids	NFPA 72: National Fire Alarm & Signaling code NFPA 20: Standard for the Installation of Stationary Pumps for Fire Protection NFPA 25: Standard for Inspection, Testing & Maintenance of Water-Based Fire Protection Systems. NFPA 13; Standard for Installation of Sprinkler Systems. NFPA 80: Standard for Fire Doors and Other Opening Protectives NFPA 102: Standard for Smoke Door Assemblies and other Opening Protectives NFPA 22: Standard for Water Tanks for Private Fire Protection NFPA 101: Life Safety Code Test procedures/protocol as determined by local Authority Having Jurisdiction. Local Building and Fire Prevention Codes

2) OTHER COMPETENCIES BASED ON TOPICS/TASKS NOT DIRECTLY MENTIONED IN THE JTA			
Specialized Core Competencies: Laboratories (Facilities that include labs will require additional specialty competencies related to mercury, radionuclides, maintenance of safety showers, lab hoods, etc.)	Anticipated lab operations and maintenance duties	1910.450 Occupational Exposure to Hazardous Chemicals in Laboratories	*ANSI Z358.1-2004,* Emergency Eyewash and Shower Equipment *ANSI Z9.5-2003,* Laboratory Ventilation NFPA 45: Standard on Fire Protection for Laboratories Using Chemicals OSHA Laboratory Safety Guidance http://www.osha.gov/Publications/laboratory/OSHA3404laboratory-safety-guidance.pdf
Specialized Core Competencies: Green and Vegetated roofs (Safe access for maintenance and use of fall prevention)	Anticipated operations and maintenance duties: either with green roof itself or to HVAC and other roof systems needing O&M *(NOTE: Vegetated roof maintenance may be contracted out)*	1910.23 Walking and Working Surfaces 1926 Subpart M Fall Protection	
Specialized Core Competencies: Solar installations (Safe access for maintenance. Electrical safety and use of fall prevention.)	Anticipated operations and maintenance duties: either with solar or to other building systems in vicinity needing O&M *(NOTE: Solar installation maintenance may be contracted out)*	1910.23 Walking and Working Surfaces 1926 Subpart M Fall Protection 1910 Subpart S	
Specialized Core Competencies: Wind power installations (Safe access for maintenance. Electrical safety and use of fall prevention)	Anticipated operations and maintenance duties. *(NOTE: wind power maintenance very likely to be contracted out)*	1910.23 Walking and Working Surfaces 1926 Subpart M Fall Protection 1910 Subpart S	
Specialized Core Competencies: Forklift:	Forklift driver training every 3 years	1910.178	

NOTE: For the purpose of this review an Operating Engineer was considered closely related to the term "Stationary Engineer". See BLS Occupation Handbook at http://www.bls.gov/ooh/Production/Stationary-engineers-and-boiler-operators.htm. The term Operating Engineer is also commonly used to describe construction equipment operators which is a separate occupation.