Commissioning Qualifications

Energy Performance Engineering, LLC
901 N Brutscher Street, Suite D104
Newberg, Oregon 97132
503.537.0270
jimmyjen@epellc.net
www.epellc.net

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Energy Performance Engineering

Qualifications Statement

Company Profile

Because building systems technology has grown in intelligence and complexity over the years, commissioning digital building systems has become a standard practice in the building industry. Energy Performance Engineering, LLC (EPE) provides building commissioning; mechanical systems diagnostics; and control systems design services to meet the needs of owners and developers. We help clients ensure they receive and maintain intended system performance and energy efficiency in their buildings.

The value of our commissioning services comes not only from finding and documenting deficiencies, but also from preventing problems that may limit the ability of the building owners to make the most effective use of their facilities.

EPE utilizes the Fault Detection and Diagnostics tool on trend data from Building Automation Systems (BAS) and data loggers to verify the actual system performance. EPE has factory training and practical experience with the industry's primary control systems including Alerton, Automated Logic, Delta Controls, Johnson Controls, Siebe Environmental Controls, and Siemens Building Technologies.

Both of our company principals are certified as LEED Accredited Professionals (LEED AP). James Jen and Elee Jen co-founded Energy Performance Engineering, LLC in 2005. James has over 25 years of experience in the system design, facilities engineering, control engineering, and commissioning. He has managed various controls and commissioning projects for public owners and local jurisdictions. Elee Jen has been providing marketing, finance and personnel functions since the beginning of the company. She works well with people, and relations are enriched by her background in science, research laboratory, marketing development, and communication systems.

Expertise & Distinguished Qualifications

New Construction Commissioning/Existing Commissioning

EPE provides independent building commissioning services. We are experienced and effective at both new construction and existing buildings. We have commissioned numerous building types ranging from commercial office buildings to large, complex, advanced technology campuses. EPE has commissioned in excess of 1.6 million square feet in new and existing buildings. Our expertise in mechanical systems diagnostics, HVAC controls, and training makes us effective at commissioning.

Building owners realize the great value of incorporating building commissioning process into their new construction and existing facilities. Our comprehensive approach to building commissioning services (both new construction and existing buildings) ensures the facility owners received fully functional building systems.

We provide the full range of professional services through our excellent teaming relationships with other experienced and skilled consultants in the areas of electrical, safety systems, and building envelopes. This ensures that every small or large project receives proper attention and is staffed with the appropriate qualified engineers and professionals.

Monitoring-Based Commissioning

EPE combines trend data and remote access technology together to provide monitoring-based ongoing commissioning services. Mr. Jen was a facilities engineer for advanced-technology facilities. He has integrated real-time trend data from Building Automation Systems (BAS) with cloud-based Statistical Process Control software over the network. This method is a cost-effective approach to ensure building owners will receive peak performance of commissioned systems over the life of the building. EPE utilizes a Fault Detection and Diagnostics software tool for trend data management and analysis to verify building performance.

Project Management/Coordination

EPE knows how to manage complex commissioning projects. Two key components needed to fit well together. These two areas are the people involved and the process being implemented. EPE chooses to treat each contracting team member with respect. We incorporate thorough commissioning specifications into construction documents, by developing commissioning plans that clearly define the designer's and installer's responsibilities. .

Quality and performance are typically the result of project management integrated with high intention, sincere effort, intelligent direction, and skilled execution. EPE generates quality control checklists, performance functional testing procedures, issues logs, and system readiness checklists in effective formats. We utilize a proven cloud-based commissioning platform for keeping team members aware of issues and resolutions. We develop flexible data base tools for managing and tracking compressed schedules, and challenging multi-disciplined teams by integrating weekly test readiness plans, start-up plans, and testing schedules.

Facility Assessments and Functional Performance Testing

After detailed site evaluations of the building systems, we provide owner-focused information to solve specific operating issues. Each assessment is customized to the owner's operational needs, and may include the following:

- Asset management strategic planning
- Facility management support and improvements
- Thermal comfort/Indoor air quality (IAQ) diagnostics
- System trending and seasonal performance evaluations
- Troubleshooting/performance problem resolution

EPE provides a high level of rigorous functional performance tests (FPT) on each system type, instead of testing systems at the low level of rigor. We believe the value of commissioning comes in the level of detailed attention that is applied to the systems being commissioned. We use well-documented test results on a sampling of similar systems in order to determine whether there is likelihood that those deficiencies would also occur on the untested systems, and how to address them.

Some of the most vital FPT are typically associated with inter-system testing. These are the most neglected aspects of non-commissioned projects. EPE understands the more interfaces there are between controlled systems, the greater the system complexity. However, this greater complexity can also yield more efficient overall building operation. EPE tests the communication between and performance of the following system interfaces:

- Air-handling system/fire alarm system
- Heating hot water system/heating water terminal units
- Steam distribution system/steam heating air handling systems
- Chilled water system/air-handling systems

Design Criteria/Review

EPE offers design criteria development and design review to meet the owner's project requirements and to satisfy applicable codes/standards/guidelines. We base the design criteria on preliminary design assumptions based on the various building codes, load calculations, climate assumptions, indoor air quality requirements, special facility use requirements, and system integration assumptions.

We are particularly skilled in the review of HVAC systems and building controls. We identify issues where the owner's project requirements may be compromised or unfulfilled. Our reviews emphasize energy efficiency, system controls, and building maintainability - and reduce change orders as a result. We offer design review services as a peer review during design phase, or as a part of troubleshooting for an existing system.

We believe design review is one of the most cost effective components of commissioning process. The sooner expert review or input is provided, the less cost is incurred due to design concepts being altered.

Controls Specifications & Verification

For most building mechanical systems, controls are the focus of system performance. One minor defect can waste energy or cause systems to fail. Control verification is the heart of our commissioning services, and we focus considerable attention in this area. EPE understands the growing complexity and intelligence of building control network. We help owners meet the challenges of integration from existing pneumatic systems to the latest direct digital control systems.

EPE also provides design and programming of controls systems. We have practical experience with the industry's primary digital control systems, including Alerton, Automated Logic, Delta Controls, Johnson Controls, Siebe Environmental Controls, and Siemens Building Technologies. We are familiar with graphical program language and line programming. EPE reviews control hardware, control diagrams, control sequences, point lists, control system architecture, and control programming before they are installed in the field. Our experience with reviewing the program code ensures the control logic is properly executed from the interpretation of written sequences of operation. EPE also evaluates two weeks of five-minute trend data on all points (physical), as part of performance review and testing.

In addition to the controls verification, EPE includes testing, adjusting, and balancing (TAB) review as part of its commissioning services relating to the flow balance. EPE spot-checks at least 10% of the balancing contractor's scope of work to resolve any flow issues.

Energy & Lifecycle Cost Analysis

EPE has a sound understanding of energy consumption of building systems. We use spreadsheets and hourly simulation tools as needed to evaluate energy-related systems. Most of all, EPE makes every effort to analyze the lifecycle costs associated with energy efficiency measures, and helps owners determine both the short- and long-term ramifications of the commissioning project.

We utilize an asset management strategic analysis to balance upfront first costs with future economic benefits. EPE incorporates a lifecycle cost analysis that will assist owner to decide the best value of their investment among the alternatives.

Measurement and Verification

EPE has wealth of experience in Measurement & Verification (M&V), which is the process used to determine actual operating savings generated by the Energy Conservation Measures (ECM). M&V holds great promise for more building assessment and tracking metrics over time. More owners require these steps to ensure their properties are truly energy efficient and performing optimally. Projected savings are maximized through energy modeling or life-cycle analysis, and verified through utility sub-meters and billing statements.

Owner's Training

As building systems becoming more complex, the importance and the value of well-trained building operator's increases substantially. EPE provides coaching and training for building operators in facility management. Topic areas include Direct Digital Controls, Fault Detection and Diagnostics, Energy Monitoring, and Control System Optimization.

Mr. Jen taught a Direct Digital Controls course in a Building Operator Certification program under the Trades & Industry Department at Portland Community College (PCC) in Portland, Oregon. Students attending his evening classes came from various building operators of medical centers, manufacturing facilities, and private property management. He was also a member of the PCC Subject Area Curriculum Committee.

Representative Examples of Past Performance

FEDERAL PROJECTS:

- VA Mental Health Substance Abuse Rehabilitation Treatment Building
- Edith Green-Wendell Wyatt Federal Building Modernization (LEED Platinum)
- Peckham Federal Court House Remodel

STATE PROJECTS:

- Oregon Department of Transportation (ODOT) Flanders Building
- PDX Headquarters/Parking Garage 2 – Port of Portland (LEED-NC)
- PDX Terminal Balancing and Concourse E Extension – Port of Portland

K – 12 SCHOOL PROJECTS:

- Pilot Rock High School / Junior High / Elementary Schools
- Hillside Elementary School
- Milton-Freewater School District (ETO Path to Net Zero)

HIGHER EDUCATIONAL SCHOOLS PROJECTS:

- PCC Newberg Center – Portland Community College (LEED Platinum, ETO Path to Net Zero)
- George Fox University – Edward Stevens Center
- PCC Sylvania AM Building Remodel

COMMERCIAL PROJECTS:

- Barcelona Multi-Family Mid-Rise Apartment
- Glisan Commons Multi-Family Mid-Rise Apartment (LEED Certified)
- Rose Community Development Woody Guthrie Place (LEED Platinum)

PUBLIC PROJECTS:

- Eugene Police Department Headquarters
- Emergency Coordination Center – City of Portland (LEED Gold)
- Bull Run Supply Treatment Improvement Facilities – City of Portland (PWB)

Federal Projects

VA Mental Health Substance Abuse Rehabilitation Treatment Building

Location: Roseburg, OR

Scope of Work: EPE assisted the VA Healthcare System in whole building commissioning services. This new construction project was designed for a substance abuse rehabilitation treatment program building. 22 beds with treatment offices are operating 24/7 for a 19,600 SF building. EPE performed commissioning services for the building systems including Facility Exterior Closure, Fire Suppression Systems, Plumbing Systems, HVAC Systems, Electrical Systems, Communications Systems, Electronic Safety & Security Systems, and Site Utility Systems.

Edith Green-Wendell Wyatt Federal Building Modernization (LEED Platinum)

Location: Portland, OR

Scope of Work: This 18 story, 370,000 square-feet federal building was built in 1974. GSA invested $139 million through the American Recovery and Reinvestment Act of 2009 to conduct a complete building modernization, which culminated in a LEED Platinum rating. EPE's tasks included design and submittal reviews, verification of equipment and system performance, development of systems manual, and review of occupied operation with GSA staff within 10 months after substantial completion. EPE was subcontracted to Glumac on the enhanced commissioning of the critical Central Server Room.

Robert F. Peckham Federal Building & U.S. Courthouse Remodel

Location: San Jose, CA

Scope of Work: Mr. James C. Jen was the principal onsite commissioning authority for this project. The scope of work for commissioning included reviewing 100% DD documents, writing CD commissioning specifications, developing the commissioning plan, conducting site visits, reviewing subcontractors' submittals, developing and witnessing functional performance testing, and compiling and writing the final commissioning report.

State Projects

Oregon Department of Transportation (ODOT) Flanders Building HVAC Upgrade

Location: Portland, OR

Scope of Work: EPE assisted ODOT to replace rooftop units, from the signing the contract to the completion of the assessment, which included the submittal of MEP design and cost estimate. ODOT was under the impression that they only needed an MEP contractor to replace the rooftop units. EPE proposed increasing the project scope to assist ODOT to solve the problems they were having. Once the EPE proposal was approved, the commissioning team coordinated the kickoff meeting to thoroughly define the scope of work and communicate to all members their role in the commissioning process. We decided that having a proper investigation of the entire HVAC system would provide the foundation for more effectively fixing the long-term issues and allow harvesting energy savings from new high-efficiency rooftop units. Through investigating and testing, EPE compiled a master list of findings into the commissioning specification as part of the replacement scope of work. We worked closely with the MEP contractor as our sub-consultant to resize the rooftop units. Retro-Commissioning is regularly involved with existing building assessment and for this project EPE showed how our team can lead the MEP installers to complement the owner's needs.

PDX Headquarters/Parking Garage 2 – Port of Portland (LEED-Platinum)

Location: Portland, OR

Scope of Work: This new construction commissioning project involved a 3 level, 185,000 SF office facility. This LEED-NC building received LEED platinum rating. The direct digital control system has an estimated 780 physical points. EPE's tasks included development of documentation of owner's project requirements, development of a commissioning plan, site observation, verification of equipment and system performance, coordination of facilities staff training, coordinating resolution of issues, and final documentation of systems manual and commissioning report. EPE was subcontracted to Environmental & Engineering Services, Inc.

PDX – Portland International Airport Terminal Balancing and Concourse E Extension – Port of Portland

Location: Portland, OR

Scope of Work: The project is to move Southwest Airlines to the new concourse. EPE provides commissioning support for the construction phase and the Occupancy/Warranty with Hennebery Eddy Architects (HEA). Tasks include: submittal reviews for commissioned equipment, review pre-functional checklists and startup forms and procedures from contractor, perform site visits, prepare site visit reports, verify/review completed start-up documentation / pre-functional checklists, and witness functional performance testing, project management, communications, and O&M Training Review and O&M Review. EPE is sub-consultant to NWESI.

K – 12 School Projects

Pilot Rock High School / Junior High / Elementary Schools

Location: Pilot Rock, OR

Scope of Work: This commissioning project involved 106,000 SF of three existing buildings on two campuses. The direct digital control system monitors and controls 695 physical points in each building. This mechanical-electrical design-build contract was to replace the existing HVAC and hot water boiler systems with new Diakin Variable Refrigerant Volume (VRV) HVAC systems. The new system added much-needed cooling, heating, and improved indoor air quality by managing outside air with demand response control and ventilation, integrating the Diakin Controls with a full Building Automation System (BAS). In three years of operation, the new system maintained an overall Energy Use Index (EUI) reduction of over 60% from the baseline year. This is a phenomenal success considering that the schools added cooling. Tasks included development of owner's project requirements, design and submittal reviews, development of the commissioning plan, functional performance testing, verification of equipment and system performance, trend data review, coordination of facilities staff training, coordinating resolution of issues, and final documentation of commissioning report. EPE was the principal commissioning agent.

Hillside Elementary School

Location: Eagle Point, OR

Scope of Work: This new construction commissioning project involved a 60,000 SF school. Tasks included design and submittal reviews, development of a commissioning plan, functional performance testing, verification of equipment and system performance, coordination of facilities staff training, coordinating resolution of issues, and final documentation of commissioning report. EPE was the principal commissioning agent.

Milton-Freewater Unified School District Projects (ETO Path to Net Zero)

Location: Milton-Freewater, OR

Scope of Work: EPE was the Prime Commissioning Consultant for Milton-Freewater Unified School District projects to provide commissioning services for the new approximately 75,000 SF K-3 elementary school and the HVAC replacement at McLoughlin High School. The new K-3 elementary school will be an Energy Trust of Oregon Path to Net Zero building.

Higher Educational School Projects

PCC Newberg Center – Portland Community College (LEED Platinum, ETO Path to Net Zero)

Location: Newberg, OR

Scope of Work: This new construction commissioning involved an 18,000 SF education building. PCC Newberg Center received LEED Platinum rating from USGBC, and was certified as a Path to Net-Zero facility through the Energy Trust of Oregon. EPE's tasks included development of owner's project requirements, design and submittal reviews, development of a commissioning plan, trending review, functional performance testing, verification of equipment and system performance, coordination of facilities staff training, coordinating resolution of issues, and final documentation of systems manual and commissioning report. EPE was the principal commissioning agent.

George Fox University Edward Stevens Center

Location: Newberg, OR

Scope of Work: This project involved commissioning a new installation of a building automation system (BAS) for underfloor air distribution at a 3-story, 45,000 SF school facility. A central rooftop air handling unit with 100% outside air economizer capability supports 40 fan coil units. Life-safety and fire-alarm are tied in with building automation system. EPE was the principal commissioning agent.

PCC Sylvania AM Building Remodel

Location: Portland, OR

Scope of Work: EPE was the sub consultant to the Northwest Engineering Services, Inc. (NWESI) for this project to develop system manuals for the HVAC systems for Portland Community College, Sylvania Campus.

Commercial Projects

Barcelona Multi-Family Mid-Rise Apartment

Location: Beaverton, OR

Scope of Work: This commissioning project was for new construction of a 4-story multi-family apartment building with 41 one-bedroom units, 3 two-bedroom units, 3 studio units, a community room, two offices, two laundry rooms and other community residential support spaces. This was a LEED project for Mid-Rise Apartments. EPE was the principal commissioning agent.

Glisan Commons Multi-Family Mid-Rise Apartment

Location: Portland, OR

Scope of Work: EPE provided commissioning services as required for LEED for Mid-Rise Apartments on the building's central mechanical systems.

Rose Community Development Woody Guthrie Place (LEED Platinum)

Location: Portland, OR

Scope of Work: EPE was the principal commissioning agent for this a new construction 4-story, 64,300 SF residential building and parking garage. We commissioned the central HVAC & associated controls that included fan coil units, heat pumps, refrigerant heating/cooling coils, energy recovery ventilators, exhaust fans, unit heater, and electric wall heaters. This building achieved LEED Platinum rating.

Public Projects

Eugene Police Department Headquarters

Location: Eugene, OR

Scope of Work: In this first year of occupancy after a major renovation, occupants at the City of Eugene Police Headquarters complained about lack of thermal comfort. The renovation included a new VAV Reheat Air Handling System, but due to an inadequate budget for a proper commissioning effort, operational and comfort issues were not found or resolved until after the project closed. EPE was brought in to collaborate and resolve the police department's challenges with the proper control sequences and operational practices. Correction included implementation of strategies for supply air temperature reset, duct static pressure reset, CO2 controls in high density spaces, and dual maximum zone controls that helped to resolve the comfort issues and make the building operate as intended.

Additionally, the building's VAV boxes use electric reheat coils. As a result of this retro-commissioning effort and implementation of the recommended strategies, the department has substantially reduced their energy costs.

Tasks for this project included planning, investigation, implementation and turnover phases. EPE was the principal commissioning agent.

Emergency Coordination Center – City of Portland (LEED Gold)

Location: Portland, OR

Scope of Work: This new construction involved addition of two levels of 26,500 SF mission critical facility to an existing 911 building. This LEED-NC registered building received a Gold rating in 2014. EPE provided full commissioning services of 30%, 60% and 100% design review, development of owner's project requirements, development of commissioning plan, construction contractor submittals review, testing-adjusting-balancing report review, functional performance testing, verification of equipment and system performance, coordination of facilities staff training, coordinating resolution of issues, and final documentation of systems manual and commissioning report. EPE was the principal commissioning agent.

Bull Run Supply Treatment Improvement Facilities – City of Portland (PWB)

Location: Portland, OR

Scope of Work: This commissioning project involved two renovated city water processing facilities. Tasks include development and review of owner's project requirements, design and submittal reviews, development of a commissioning plan, functional performance testing, verification of equipment and system startup, coordination of facilities staff training, coordinating resolution of issues, and final documentation of systems manual and commissioning report. EPE was the principal commissioning agent, teamed with Michael Willis Architects