

## Commissioning

### What is Commissioning?

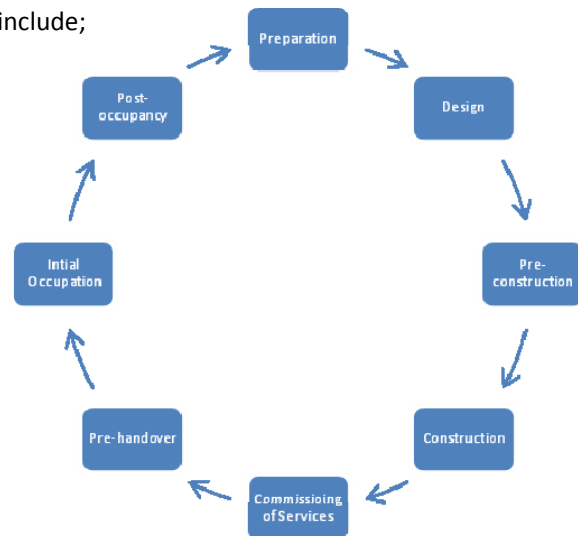
The commissioning process can be considered as a quality assurance process that enables the construction project teams to deliver a building in full working order to the specified requirements. This is an important distinction between the delivery of the physical building and a building in full working order that really works for individuals, businesses and the environment.

The concept of full working order requires a number of objectives to be complete and there are many variables that affect how a building and its engineering services perform. The process in general includes the incorporation of design features that will enable verification activities such as functionality, pressure testing, flow regulation, but also procedures that cover specified settings to work, system regulation and performance testing. In addition, training of user and operators, and important system documentation must be part of the commissioning process to effectively support building operation and use in the future.

### Commissioning Stages

There are eight stages of the commissioning process, which include; preparation, design, pre-construction, construction, commissioning of services, pre-handover, initial occupation, post-occupancy care.

It is known that a building's actual energy use in the first year is up to 25% higher than estimated during the design stage and this is attributed to poor commissioning and handover. Successfully conducting all the stages above and starting the commissioning process as early as possible ensures cost effective project completion whilst enabling the building occupants to maximise equipment use long after the construction process is complete.



A summary of activities carried out at each stage is listed below:

#### Stage 1 – Preparation:

- Form the commissioning team
- Review lessons and experiences from similar buildings and projects
- Clearly identify the performance outcomes expected by client and the end user
- Help produce the design brief that correctly represents the required performance

#### Stage 2 – Design:

- Review the performance outcomes with the client
- Ensure commissioning process activities have been clearly identified
- Ensure the performance outcomes reflect and changes to the system /project design

#### Stage 3 – Pre-Construction:

- Make sure the contractors clearly understand the performance requirements
- Verify the capabilities of the trade contractors to meet the requirements of the commissioning process

#### **Stage 4 – Construction:**

- Produce a detailed commissioning programme.
- Conduct pre-commissioning works, involving verification of installation works and static tests. Verify and document performance outcomes have been achieved.
- Ensure continuously progress is made the production of the O&M's manuals.

#### **Stage 5 – Commissioning of Engineering Services:**

- **Perform the setting to work of systems. Verify and documents that the required performance outcomes have been achieved.**
- **Undertake performance testing of the building, equipment and engineering services. Verify and documents that the required performance have been achieved.**
- **Involve facilities management personnel in the commissioning works.**
- **Collate the commissioning checklists and test sheets.**

#### **Stage 6 – Pre-handover**

- Verify the quality of the documentary evidence from commissioning process works.
- Ensure that all required statutory documentation has been produced.
- Conduct training of users and operators.
- Produce and circulate building user guides.
- Check the client's requirements and react to any differences.

#### **Stage 7 – Initial Occupation:**

- Introduce user to their equipment/building and show how it operates.
- Help the facilities management team with initial building operation.
- Update commissioning records in accordance with and approved changes.
- Update the O&M manuals in accordance with any approved changes.

#### **Stage 8 – Post-occupancy care:**

- Carry out seasonal commissioning
- Fine tune building and its engineer services
- Collect and review evidence about the building performance
- Update commissioning records and O&M manuals in accordance to ant seasonal commissioning and fine tuning works
- Produce lessons learned comparing building performance with design intent, client stakeholder expectation and benchmarks

### **Post-Installation Service by VES**

At VES we understand the importance of commissioning and the requirements for each stage of the commissioning cycle. As equipment manufacturer providing energy efficient HVAC solutions we feel it is important to offer services that help answer the commissioning needs.

VES offers Post-Installation Commissioning for all VES equipment, to verify the performance of the equipment, together with environmental, functional, operational and energy performance outcomes required by the specification. Included within this service is the following:

#### **Setting to work the equipment:**

Setting to work is the process of setting a static system/equipment into operation. We validate the system and equipment is ready for regulation, automatic control and performance testing.

**Regulation of the equipment:**

Regulation is the process of adjusting the operation of systems with reference to a standard or purpose. The objective for VES is to achieve performance in accordance with specified values and within specified tolerances.

**Performance testing:**

Performance testing is the testing of a system or grouping of systems to determine if certain performance criteria are met.

VES test all control system sequences of operation and different operation modes, such as varying heating and cooling loads, different external temperatures and occupied and unoccupied states. Then we test in emergency scenarios, such as power failure, component failures and fire alarm to prove that the building can function safely and recover to specified design states.

Performance test should verify the ability for the equipment to deliver and maintain the specified performance outcomes at the points of use, this may relate to temperature, humidity, sound level, air movement, time, indoor air quality and room pressurisation.

**Safe working procedures:**

The adoption of safe working practises that promotes good worker health is a pre-requisite for all site-based commissioning works. So it is standard practise for VES to provide risk assessments and method statements for all site work undertaken by VES, complemented by personnel in possession of a Construction Skills Certification Scheme (CSCS) card proving they have the skills necessary to effectively conduct this service.

**Client demonstration and training:**

VES recommends that clients, facilities management teams observe setting to work, system regulation and performance testing activities. This insight will enable these people to take safe and efficient control of their building immediately on handover.

**Commissioning and handover documentation:**

The provision of commissioning process verification and test records is an essential part of the handover information provided for a building. Not only do they provide evidence that the required performance outcomes have been achieved but further more knowledge of the way in which the system has been setup for operation play a vital role in any improvement, modification or fine tuning works that may take place after handover.

VES supply a commissioning report document for this purpose along with a set of equipment Operation and Maintenance.

**Summary**

Our post installation service is a complement to the overall commissioning process. It ensures that equipment purchased from VES operates for maximum efficiency from the start, whilst verifying that HVAC equipment performance has been achieved. This service is carried out on site at the discretion of the M&E installer providing full system review, performance optimisation, client training and demonstration with accompanying documentation to support equipment use now and in the future.

If a BlueSense energy saving package is purchase from VES with accompanying post-installation commissioning we will provide a 5 year warranty, extending our commitment to quality products and services.

*For more information on Post-Installation Commissioning from VES or our BlueSense energy saving package contact our sales office.*

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