



## Commissioning & Operation Manual



This document outlines the procedure to commission the mepBLITZ DC-is and also an illustrated step by step operation guide



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## Book Descriptions:

# commissioning operation and maintenance manual

The transfer of a completed facility to the Project Leader must include appropriate documentation on how the facility is designed and constructed, and how to operate, maintain, repair, clean, manage and modify it. It serves as a project archive for future reference base data for operations and maintenance, renovations and inspection purposes. It can provide a valuable record of experience for feedback to other projects. The Project Archives should include all commissioning documents that contain data deemed essential to a comprehensive record of the project and its component systems. The purpose is to provide It should include BMM for heritageIt must include sections describing If these are given the very serious consideration that they deserve from the outset, there is every possibility that the entire project will be effectively commissioned and client satisfaction is assured. Functional requirements and operational requirements must not be open to any misinterpretation or misunderstanding. If these are not established by the client they may be established by the Project Manager or the designer. These could include clients specific requirements for systems commissioning. These may include, but are not necessarily limited to Both of these items must be the result of careful examination of the functional and operational requirements contained in the RFP. In this case, they must be approved by the PSPC Design Quality Review Team during the development of the Conceptual Design Report. They must be based upon considerations such as building age, heritage value, architectural and structural considerations, condition, of the existing building, exterior environmental conditions, previous usage, etc. It is therefore critical that, without limiting the freedom of the designerbuilder to develop innovative design solutions, that all the appropriate design criteria, performance criteria, etc., be clearly established in the RFP.<http://adamlegal.com/userfiles/carrier-heat-manual.xml>

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All commissioning roles and commissioning activities must be clearly defined within the designbuild Request For Proposal RFP. Unless strictly controlled, these accumulatedUnless considered at the outset of the project this may well be forgotten, or squeezed out for want of the small amount of additional space in the Mechanical Equipment Room. WHMIS data sheetsAll parties to a construction project take much great care in all aspects of project management.They set out the quality control and quality assurance for the project. Plans and specifications are used by the Project Commissioning Team to verify that the built works conform to all commissioning deliverables. They must include sufficient details to enable the contractor to understand all requirements clearly and to submit an accurate price for commissioning and must include The lists prepared by PSPC must be considered as generic and illustrative only, and must be tailored to suit the project requirements. The samples provided by PSPC should be considered as generic only and may need to be tailored to suit requirements of the project. This allow for the building and its contents to adjust slowly to the changed conditions. It consists of five discrete sections This may occur more often on projects for special purpose facilities. We're here to help! For more details, please read our We are excited that you have joined the group. You will receive your first welcome message soon. It will describe the email program and what to expect in the upcoming weeks. Enjoy. Complex systems need to have followup on the initial commissioning at low, medium and high load warm, medium and cold ambient

to ensure proper and energy efficient operation. To include this as a responsibility in the contract is very costeffective. The commissioning engineer will require details and ratings of all major items of the plant and copies of any manufacturer's instructions on setting to work and operating their products. <http://chickenwild.com/upload/contents/images/carrier-gas-furnace-installation-manual.xml>

If this information is not to hand, the work will be delayed. For example, components are those specified, electrical equipment is suitable for the pressures and temperatures, pipework correctly installed and adequately supported, cleanliness of heat exchangers, water circuits and filters, compressor mountings correctly installed, safety and pressure controls correctly connected, nonreturn and pressure regulating valves correctly positioned, correct wiring and control sequence.

27.3.3 Preset Controls The next stage is to preset as many controls and protection devices as possible. Only after all possible static checks and adjustments have been made to the system should it be started for the first time. These precautions will prevent most of the common types of failure occurring during the initial running period. Typically settings include service shutoff valves open, water controls set, control switches preset as accurately as possible, temperature control and cutouts set. Air in these systems can be virtually impossible to remove if the gas is distributed as micro bubbles in the system due to operation without proper degassing. This will affect the performance of the system during tests and operation. The refrigerant charge and system operation should be checked and set for the complete range of load and ambient conditions. Followup tests may be required to cover a range of ambient conditions. The refrigerant charge should have been added according to the weight specified, and additional charge should not be required. When the system has been operating for a sufficiently long period, conditions in the cooled space can be checked against specification, and other typical points to watch for include evaporator superheat and refrigerant distribution, excessive pressure drops, compressor oil levels, correct condensing pressure.

The operation of pressure controls such as evaporator pressure regulator and condensing pressure controls together with defrost systems can be checked. It may not be possible to operate at the extreme conditions and whilst it may be possible to achieve highcondensing pressure by turning off fans, this will not be realistic, as this creates the same condensing pressure but not the same subcooling and the load will be different. A more realistic test of the refrigerant cycle is to temporarily enclose the condenser and force the air to recirculate without limiting the flow. It is best to have followup controls at different seasons in the first year. The whole system is now left to run for a shakedown period, which may be from a few hours to several days, depending on the size and complexity. During this time, all components are checked for vibration, leaks or other malfunction, and remedial action taken. For large lowtemperature systems and cold stores, temperatures should be reduced slowly, to allow for shrinkage in the structure. Some final adjustments to airflows, secondary fluid flows, etc. It is probable that a full load cannot be obtained during the final test, for reasons of low ambient or lack of completion of other equipment for the process. In the absence of analysis tools, the commissioning engineer must make an estimate of the system performance, on the basis of time run, or otherwise interpret the figures obtained. In such cases it may be advisable to agree to a tentative acceptance of the plant and carry out a full, minimum and part load tests at a later date.

27.3.6 Hand Over A complete set of plant documentation and commissioning records should be left on site for future reference.

<http://www.raumboerse-luzern.ch/mieten/bosch-rexroth-ecodrive-cs-manual>

Modifications are made to the plant; a wide variety of tests and examinations are performed on individual items of equipment and on the plant as a whole; the computer software is modified and parameters entered; modifications are made to the systems and procedures and the associated documentation; reviews are made of safety and environmental features and there are matters to be carried forward. This aspect has already been discussed. The registers for the pressure vessels,

pressure piping systems and protective devices should have been prepared prior to commissioning, but much information on the equipment and on its initial examination and testing will be entered at the commissioning stage. Records should be kept of the tests done on the whole range of equipment, including pressure vessels and the pressure piping system, pressure relief valves, rotating machinery, instruments, and the computer system. Any modifications made to the computer software or to the parameters entered should be recorded. It is common practice to hold an inventory of commissioning spares. With the end of commissioning this should be replaced by the regular spares inventory, which should be documented. There should be records of any safety and environmental reviews conducted. The safety reviews should include any matters requiring followup consequent to the main hazop study or any further hazop studies performed as a result of commissioning modification and the postcommissioning safety audit. There will also have been modifications made to the various types of documentation such as operating instructions, test procedures, etc., and these changes should now be incorporated and final documents produced.

<https://www.imperialaccountingfl.com/images/business-victoria-hr-manual.pdf>

View chapter Purchase book Read full chapter URL Design, Construction, and Renovations James Sinopoli, in Smart Building Systems for Architects, Owners and Builders, 2010 Owner Representatives These representatives, including the information technology director, facility manager and the security manager, are involved in the building process because they will eventually be managing and operating the systems. The initial configuration of building technology systems, training in system management and operation, system documentation, commissioning and longterm support, and maintenance and warranty of the systems are all part of the design process that owner representatives will be involved in. In addition, an owner may have legacy systems requiring migration of older equipment to a new building or may have established relationships with manufacturers or contractors that need to be considered. As the design progresses and becomes more specific, the designer has the responsibility to ensure that the design is constructible; in other words, that what is designed can actually be built or installed. The designer does this by communicating with potential contractors and researching and identifying products that will meet the design criteria. By identifying selected products the designer sets performance standards, takes into account product history or life cycle, gets owner approval, further develops the design and refines project cost estimates. This may be a time for manufacturers or contractors of building technology systems to provide technical advice to the designer and assistance in specifications, drawings, and cost estimates. System specifications will typically follow the MasterFormat by the Construction Specifications Institute CSI. In this format major building subsystems have their own Division or Section. The older MasterFormat has 16 divisions addressing how buildings were built over the previous 10 to 15 years.

<http://immobilien-ankauf.com/images/busy-bee-band-saw-manual.pdf>

A review of all electronic files also needs to be completed, updated accordingly and saved to the appropriate hard drive or site network location for archiving and future use. NOTE Assistant commissioning engineers will help in the delivery of all activities documented above. View chapter Purchase book Read full chapter URL Green Project Commissioning Sam Kubba PH.D., LEED AP, in Handbook of Green Building Design and Construction Second Edition, 2017 11.4 Planning the Commissioning Process Since each building is in many ways unique, it is necessary for the commissioning process to be adapted to meet the specific needs of each individual building project. To get the full benefit of commissioning, the commissioning plan should provide guidance in the execution of the commissioning process and preferably commence early in the design process. It is also very important to establish a clear method for sharing information at the earliest stages of the process. Likewise, it should contain a process for identifying planning delivery team member roles and responsibilities and tasks for the various project phases and activities. These include

development and approval of Commissioning Plans, overview of review and acceptance procedures, documentation compliance, checking commissioning schedules, and testing and inspection plans. It forms part of the bid and contract documents and is binding on the Contractor; it also outlines many of the Contractor's responsibilities, procedures, and tasks throughout the Cx process and that are part of the project. The specifications will take precedence over the Commissioning Plan. Included in the Commissioning Plan should be a full description of the functional performance testing FPT that will be performed during the Acceptance Phase and culminating with staff training and warranty monitoring.

Normally, the commissioning process culminates with a final complete commissioning report that is prepared and submitted to the owners along with drawings and relevant equipment manuals. This report should contain all the documentation pertaining to the commissioning process, procedures and testing results, in addition to any deficiencies and records of accepted corrections of these deficiencies. System commissioning requires specialized knowledge which is why it is usually conducted by a mechanical consultant with appropriate experience and training. This person preferably hired by and responsible directly to the project's owner and is independent of the mechanical consultant firm and general contractor. Where very large or complex projects are involved, it may be necessary to designate a special commissioning coordinator to be responsible for conducting commissioning process. The architect or designer of record DOR is normally designated with the responsibility of overseeing completion of the commissioning process. In cases where TBCx is requested, this typically includes additional essential systems of a building such as the building's exterior wall, plumbing, acoustical and roofing systems. Having these additional systems commissioned can provide many advantages including helping to reduce moisture penetration, infiltration and noise problems, and contribute to the building's energy and resource efficiency in addition to facilitating occupant productivity. Building Commissioning Guide. 11.4.1

Documentation—Compliance and Acceptance As previously mentioned, commissioning serves as a general record of the owner's expectations for project performance during the project delivery process. It is a conscience team effort that documents the continuity of the project as it progresses from one project phase to the next. In the earliest phases of the project, i.e.

, Planning and Development, we see the establishment of planning and programming documents that begin to define an owner's requirements, goals, and standards for building performance. By appropriately documenting the entire project delivery process, a chronological perspective is put into place that outlines and clarifies the iterative process of determining the agreed to project requirements at each phase of the development process. Commissioning documentation therefore becomes the road map for the success criteria to be met by facilities when they are put in service and verifies that designed and installed systems meet the specified standards. After the building project is occupied, commissioning documentation becomes the benchmark to ensure that the building can be maintained, retuned, or renovated to meet future needs. The OPRs are documented from the beginning of the facility's initiation, recording compliance, acceptance, and operations throughout the facility's life cycle. These include A. The Contractor is required to deliver to the CxA one copy of the following as specified in the Cx Plan and other sections of the specifications and contract documents 1. Shop drawings and product data relating to systems or equipment to be commissioned. The CxA shall review and incorporate any comments via the designated design engineer 2. Startup checklists along with the manufacturers startup procedures for installed equipment. CxA will review, assist, and recommend approval if appropriate 3. Provide all System Test reports. CxA will review and compile prior to FPT 4. Completed Equipment Startup certification forms in addition to the manufacturer's field or factory performance and start up test documentation. CxA will review prior to FPT 5. Completed Test and Balance Reports. Designate the Construction Specifications Institute CSI Construction Specification Section 01810 in Division 1 for general commissioning requirements.

Use the unassigned Sections 01811 through 01819 to address requirements specific to individual systems. Notify the mechanical and electrical subcontractors of Division 15 and 16 commissioning requirements in Sections 15995 and 16995.

4. Functional performance test procedures and checklists Develop functional performance test procedures or performance criteria verification checklists for each of the elements identified in the commissioning plan.
5. Commissioning report Complete a final commissioning report and submitted to the Owner. The commissioning report should summarize all the tasks, findings, and documentation of the commissioning process and will address the actual performance of the building systems in reference to the design documents. The report should identify each component, equipment, system, or feature including the results of installation observation, startup and checkout, operation sampling, FPT, and performance criteria verification. This includes performance testing of equipment and systems, fire system verification, final punch list development, code official inspections, obtaining certificate of occupancy, etc. Additionally, it is during this phase that most of the formal training occurs which generally includes requirements after the construction phase is substantially complete and occupied. The end of this phase is marked by an "Approved Functional Completion" document. Most of this section of the WBDG is based on the Commissioning Process recommended in ASHRAE Guideline 02005. It is strongly recommended that project teams that employ the Building Commissioning Process follow the process outlined in ASHRAE Guideline 0 or the Total Building Commissioning Process TBCxP. Guideline 0 has been adopted by both ASHRAE and the National Institute of Building Sciences NIBS and does not focus upon specific systems or assemblies but adheres to a standard process that can be used to commission any building system critical to the function of a project.

The NIBS Total Building Commissioning Program is currently working with industry organizations to develop a set of 11 to be eventually 18 commissioning guidelines for various systems and assemblies related to TBCx. The acceptance phase is of particular importance to innovative and unique buildings, such as sustainable buildings. Sometimes the acceptance phase may also include training and developing of the system manuals. The scheduling and clearness of acceptance phase tasks are very important because they provide the information on what was delivered and also provides information for the owner to facilitate successful operation and maintenance of all building components and systems that were commissioned. View chapter Purchase book Read full chapter URL Commissioning of nuclear power plants NPPs E. Grauf, in Infrastructure and Methodologies for the Justification of Nuclear Power Programmes, 2012

### 22.8 Commissioning procedures

A commissioning programme has to identify and describe all the tests and related activities necessary to demonstrate that the plant has been properly designed and constructed and can be operated safely. The commissioning programme should be written in such a form as to enable the objectives and methods of testing to be readily understood by all concerned and to allow control and coordination by management. For multiunit plants a separate programme is produced for each unit. It is good practice to collect all relevant administrative and technical procedures related to the commissioning programme in a comprehensive document such as a Commissioning Manual.

#### 22.8.1 Commissioning Manual

In order to ensure an effective and safe execution of the commissioning process, activities and measures have to be carefully defined and established in written procedures. A clear definition of tasks, responsibilities and interfaces between the entities involved in the commissioning activities is also required.

The Commissioning Manual usually consists of an organizational part and a technical part. More details about test procedures are provided in Section 22.9. Whatever the organizational arrangements for commissioning of an NPP, the Operating Organization has to review and approve the Commissioning Manual; furthermore, it is common practice that the commissioning programme is also submitted to the Regulatory Body for review and approval.

#### 22.8.2 Commissioning programme

Commissioning is essential to the subsequent safe operation of the plant and therefore needs to be carefully planned and executed. The commissioning covers all the activities to be performed on

structures, systems and components to bring them to an operating mode. Commissioning is part of the process of verification that the provisions of the design basis are met and that the assumptions made in the safety analysis report are justified. To fulfil these demands, an appropriate and detailed commissioning programme has to be designed. The programme is divided into stages whose number and size will depend upon safety requirements and technical and administrative requirements see Section 22.3 . The programme shows the planned duration of the activities and their interrelationships, and includes activities that may be necessary in order to provide opportunities for the operating personnel to gain familiarity with the operation of the plant. During commissioning, normal operating procedures, including those for operational periodic tests, are used as far as possible to validate the applicability of these procedures. The EOPs, which are not used in routine commissioning operations, should also be validated in the commissioning programme, as far as possible. Testing, as the core of the commissioning programme, needs to be sufficiently comprehensive to establish that the plant can operate in all modes for which it has been designed to operate.

However, tests should never be conducted, and operating modes or plant configurations should not be established, if they have not been analysed, if they fall outside the range of assumptions made in analysing postulated accidents in the safety analysis report, or if they might damage the plant or jeopardize safety. The Operating Organization has to ensure that such an action does not jeopardize safety and that it is take only with the prior approval of the Regulatory Body. Special provision has to be made to ensure that the safety of another nuclear unit or other facilities close by and already in operation is not jeopardized in the commissioning tests. Such provisions include conducting a hazard assessment and obtaining the prior approval of the Regulatory Body and specific written approval from the manager responsible for the operating unit. Close liaison between the Regulatory Body and the Operating Organization throughout the development and implementation of the whole commissioning programme is recommended so as not to delay the commissioning process. By continuing you agree to the use of cookies. This effort should be considered in the planning and design phases, and is typically carried out in the construction phase. Building Information Modeling BIM and, in particular, COBie, introduced at the front end of the project helps facilitate the entire process. Those selected to perform the work should have the following capabilities Its important to the overall facility management program that facilities personnel be properly instructed and motivated. These can be defined through a Maintenance Plan MP. PM includes adjusting, lubricating, cleaning, painting, and replacing minor components. Once developed, the MP will typically identify PM task descriptions and schedules, troubleshooting, corrective maintenance repair task descriptions, and spare parts identification, stockage quantity, and any unique storage requirements.

This information will be incorporated in the manual, both as tabular data and text. Construction Operations Building information exchange COBie —If specified based on the draft guide specification, COBie facilitates the capture of realtime asbuilt asset information by using the collection of contractor submittals. COBie may also be applied through Building Information Modeling BIM technology, although BIM is not necessary to implement COBie. Stretching out the process avoids the tsunami of information at handover. It is important to analyze and evaluate a facility from the system level, then develop procedures to attain the most efficient systems integration, based on asbuilt information and the Maintenance Program philosophy. Outlines the structure, content, how to use the manual, and includes a brief outline of the various systems covered. In addition, this chapter contains a list of emergency contacts and a list of supplementary material available on the facility such as These include water supply systems, sanitary waste, electrical, natural gas, communications, security, and storm water, etc. The importance of conducting an annual inspection is discussed together with record keeping forms for conducting the inspections. Manufacturers literature generally provides procedures to operate, maintain,

troubleshoot, and repair specific items at the equipment level. Specific material or complete documents can also be electronically scanned for its online use, such as linking from the systemlevel manual. A table can provide overall system design criteria, i.e. flow, pressure, temperature, capacity, power requirements, etc. Typical malfunctions, tests, or inspections, and corrective actions or recommendations to correct malfunctions are included. Preventive and corrective maintenance are discussed. Scheduled intervals e.g., daily, weekly, monthly, etc. are determined and assigned to PM tasks to maximize systems run time, thereby reducing corrective maintenance tasks.

They typically include the following One caution relative to linking to internet sources is that of security. The Owners information technology IT department should be consulted in these instances. This in itself may require the performance of a task and skills analysis to ensure that any given facility is staffed appropriately. COBie is a method of capturing information typically required during construction and provided to Owners, typically the same information that is required at project handover. When systemlevel manuals are specified, contractors who may not have the capability internally will typically outsource subcontract the effort. The manual developer should report directly to and be responsible to the Owner, not the contractor. For example the U.S. Department of Defense requires the development of a Facility Electronic Operation and Maintenance Support Information eOMSI manual for a facility that houses engine test cells. The goal of Whole Building Design is to create a successful highperformance building by applying an integrated design and team approach to the project during the planning and programming phases. Disclaimer. Linguee Look up words and phrases in comprehensive, reliable bilingual dictionaries and search through billions of online translations. Blog Press Information Linguee Apps You helped to increase the quality of our service. You can find out about our cookies and how to disable cookies in our Privacy Policy. If you continue to use this website without disabling cookies, we will assume you are happy to receive them. Close. It is a requirement that is generally defined in the preliminaries section of the tender documentation where its contents will be described, although there may be additional requirements regarding mechanical and electrical services in the mechanical and electrical specification.

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