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Briefing Note for the Production and Use of a Commissioning Brief

VENTILATION TECHNICAL PLATFORM (VTP)- LIBRARY OF TECHNICAL GUIDANCE

Introduction

Under the current HTM 03-01 standards designers are required to produce certain critical information regarding the design intent and performance criteria at the end of the design stage to ensure that the subsequent commissioning and validation processes can be completed to achieve the agreed design standards and performance.

Scope

The purpose of this document is to provide an overview on the production, use and minimum requirements for a commissioning brief and highlight the timing and responsibilities and purpose of the document to improve the commissioning and independent validation process for new and refurbished ventilation systems / projects.

This document seeks to outline the responsibilities of each of the main stake holders so that issues surrounding commissioning and validation process can be dealt with quickly and efficiently to minimise the risks relating to project completion and safe operational use.

Acknowledgments

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General

This information is described within the HTM standard as the Commissioning Brief. The document should include a number of key elements and provide a record of where design criteria may differ from minimum performance standards of the HTM and record the basis of this derogation or reference where the information relating to the performance criteria is recorded and agreed.

Information to be provided

Under clause 11.9 of the HTM 03-01 Part A, It is essential that the designer should pass on the system-design intent fully to the commissioning engineer by providing:

- relevant parts of the specification;
- schematic drawings indicating data listed in Table 11 (HTM 03-01 Chapter 11 pg112);
- equipment schedules;
- controller and regulator schedule;
- fan performance curves;
- wiring diagrams for electrical equipment, including interlock details.

This is the basic design information that should be included within the 'Commissioning Brief'.

Commissioning brief

Under clause 11.13 The commissioning team will require a detailed brief from the system designer. This document is likely to develop over the course of the scheme, however should as a minimum at design stage include:

- a "user" brief comprising a description of the installation and its intended mode of operation;
- the precise design requirements with regard to the scheme of air movement, room static pressures, supply and extract airflow rates and acceptable tolerances;
- full details of the design conditions both inside and out, for winter and summer, together with the control strategy;
- equipment manufacturers' type test data, commissioning, operation and maintenance recommendations;
- drawings showing the layout of the system, positions of airflow measurement test points, dampers, regulating devices and filters within the duct runs, together with sizes of ducts and terminal fittings. It will save time if these drawings are annotated with the design volumes and static pressures required at each branch and outlet point;
- wiring diagrams for all electrical equipment associated with the air handling systems, including motor control circuit details and any interlocking and safety devices.

The commissioning brief at the design stage needs to include the design performance criteria used and detail any areas where design criteria may differ from minimum performance standards of the HTM and record the basis of this derogation or reference where the information relating to the performance criteria is recorded and agreed. This could include where air change rates have been set to exceed minimum levels to accommodate free cooling opportunities, or where elements of witness testing have been excluded or altered. This detailed design criteria will be the basis of both the commissioning and independent validation process.

In addition to the design Commissioning Brief the project management team will typically also need to undertake and collate a range of test records and witnessing records for elements of the ventilation installation which will be required to complete the commissioning process and are also essential for the independent validation of the systems prior to the services becoming operational. These installation records can include the following elements.

Standard of installation

Under clause 11.20 of the HTM it outlines that during the installation of the system the following will be witnessed:

- that the plant and installations have been provided and installed in accordance with the design specification and drawings;
- that only approved sealants have been used in the installation;
- that all components function correctly;
- that the satisfactory sealing of access doors and viewing ports has been carried out;
- that the AHU airtightness test as per BS EN 1886 has been carried out;
- that air-pressure tests and air-leakage tests on ventilation ducting have been carried out in accordance with the methods set out in the BESA DW143 – 'Ductwork leakage testing' but the leakage rate to be not greater than 3% (it is usual to carry out these tests a section at a time as the ductwork is installed and before its insulation is applied. The results will be recorded in the commissioning manual);
- that gaps around doors and hatches are as specified in the design;
- that the permeability tests are carried out as per paragraph 12.17;
- that the correct operation of pressure stabilisers, control dampers, isolating and non-return dampers have been checked;
- that test holes have been provided in their specified locations and are sealed with suitable grommets;
- that control dampers are secured and their quadrants fitted correctly;
- that any interlocks are operative and in accordance with specification;
- that the electric circuits are completed, tested and energised;
- that electric motors have been checked for correct direction of rotation both at full speed and set back;
- that cooling and heating media are available at correct temperatures and pressures and in specified quantities;
- that the air-conditioning plant components and controls function correctly;
- that the air-conditioning plant interlocks and safety controls function correctly;
- that a suitable risk assessment has been completed for any 'open water' elements for legionella and other waterborne pathogen risks,
- that the plant is physically complete, insulation is applied and all ducts and pipework are identified as specified;
- that all service penetrations of the fabric of the area are sealed at the point of penetration (see also paragraph 10.30);
- that the building housing the ventilation plant is generally in a fit condition for commissioning and performance tests to commence, that is, windows, doors, partitions, ceilings, etc are completed, surfaces sealed and their final finish applied;
- that the areas containing the ventilation plant and those being served by it are clean;
- that access to all parts of the system is safe and satisfactory.

All of the above elements need to be witnessed or assurance provided that they have been undertaken and completed. It is advised that as part of the Commissioning Brief and early engagement of both the commissioning contractors and independent validators / Authorised Persons or Authorising Engineers, that a detailed strategy and agreement is reached on who and how this assurance will be provided and recorded, to ensure that the commissioning and validation process proceeds as smoothly as possible.

LEV System Commissioning

In addition to the above requirements for all critical and general healthcare ventilation systems it should be remembered that under the HSE standards for Local Exhaust Ventilation (LEV) systems there are specific requirements for the commissioning of these types of systems as outlined below:

Commissioning objectives:

- ensures that there is adequate control from day one
- proves that the system is providing adequate control
- provides a benchmark for later regular examinations and tests

The commissioning report

The commissioning report should always include the:

- date of the test
- duty holder's name and address
- commissioner's name, job title and employer

Ensure the report has been signed appropriately. You are responsible for ensuring your commissioner has demonstrated impartiality and competency.

Before using LEV

Before you start using your LEV system, ensure it has been checked and is suitable for the process when in use and compatible with the substances handled. The system should be installed correctly according to design, specification and any manufacturer's instructions, and meet specified technical performance.

For more information read chapter 5 of Controlling airborne contaminants at work: A guide to local exhaust ventilation (LEV) - HSG258.

Core elements of LEV commissioning

Ensure that your LEV commissioner has:

- identified the LEV system and location – for example, LEV tester assigned a unique number
- assessed control and demonstrated whether the LEV system adequately controls exposure to the hazardous substances by:
- identifying the hazardous substances it is intended to control
- defining the process and how emissions occur
- defining the operating conditions
- detailing test methods and results
- defined benchmarks by providing performance targets such as flowrates and pressures, as reference for statutory examinations, maintenance and performance management
- ensured the LEV system is correctly balanced and achieving the performance required at every hood in a system

LEV condition

The commissioning report should detail the general condition of your LEV and the operating conditions at time of commissioning, including any external factors that might influence performance. It should also describe:

- the general configuration, components, fan specification, filter media, waste collection, make-up air supply and discharge arrangements, location, photographs of relevant parts and assign identification number
- any minor adjustments or repairs carried out to make the LEV system effective
- the methods used to judge performance, such as visual, smoke test, airflow measurements, pressure measurements, dust lamp, air sampling and filter testing

Commissioning results

You should be able to understand the information provided in the results. It should also give you enough information to update your user manual and logbooks after any defects have been resolved. The commissioner should include a simple summary describing the effectiveness of the system. It should also include:

- quantitative assessment results such as volume flow rates, face velocities, duct velocities, static pressures, fan speed, motor speed and electrical power consumption and filter performance (where applicable)
- qualitative assessment results, including suitable observations
- the results of any airflow indicators and relevant air sampling
- a simple schematic with test points
- calibration certification

The commissioner should also provide information on the frequency of testing, if different from the statutory 14 months.

Training and information

Employees and operatives must be given suitable and sufficient information, instruction and training in the use of LEV.

What the law says

Employers must assess and control the risks from exposure under the Control of Substances Hazardous to Health Regulations (COSHH) (as amended). They must provide appropriate information and training to workers, and LEV systems should be tested at least every 14 months.

LEV systems also present additional risks. Employers must control the risks to safety from fire, explosions and substances corrosive to metals under The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR). Employers must also consider compliance with The Control of Noise at Work Regulations 2005, to ensure that workers' hearing is protected from excessive noise.

Other regulations may also apply.

All Ventilation Systems - Certification of equipment

Under clause 11.21 The following test certificates should be assembled by the commissioning team and be available for inspection at any time during the contract period. They will form part of the handover information and should be placed in the commissioning manual:

- type test performance certificates for fans;
- pressure test certificates for:
    - heater-batteries;
    - cooling coils;
    - humidifier (if appropriate);
- type-test certificates for attenuators;
- type-test certificates for primary and secondary filters;
- individual test certificates for EPA or HEPA air filters.

Commissioning Records

When presenting the commissioning information, prior to independent validation the commissioning engineers should present the information against the compliance criteria of the commissioning brief and provide analysis or an assessment of compliance, not just the ‘raw data’. If this is not practical then the data should be presented in a format to enable direct comparison to the stated design criteria.

Finally it is also critical that time allowances made within the programme are protected and not compressed or commenced before an installation is appropriately completed, as this will typically result in poor or failed processes and avoidable repetition and costs.