Service delivery standard for providers of pre-commission cleaning of newly installed closed cooling and heating systems

1.0 Introduction

This standard sets out minimum service requirements for CSCA members (subsequently referred to as "Service Providers") offering pre-commission cleaning of newly installed closed heating and chilled water pipework systems.

This standard does not apply to remedial cleaning of operating systems.
A separate standard exists for CSCA member engaged in remedial cleaning of operating systems.

A separate service delivery standard also exists for CSCA members offering routine monitoring of water quality.

2.0 Management overview

The Service Provider should provide a management overview for each project covering the following issues:

2.1 Scope of works – the range of activities to be undertaken.

2.2 Communication and management – the management, contractual and communication routes between parties involved in the clean.

2.3 Allocation of responsibilities – the responsibilities of the various parties involved in the clean e.g. main contractor, installer, commissioning specialist etc.

2.4 Training and competence of all personnel involved – the required and anticipated training/experience levels of the individuals involved in the cleaning process (both in-house staff and sub-contracted staff).

2.5 Control measures - for the supervision, implementation and monitoring of the cleaning process.

2.6 Health and Safety risk assessments – Covering safe handling of chemicals, delivery, storage, and application methods.

2.7 Control of sub-contractors – the procedures in place for managing and controlling the work of sub-contractors, where applicable.

2.8 Internal auditing – the internal checks and reviews within the Service Provider's organisation for checking and confirming that works are being undertaken in compliance with specified requirements and industry good practice.

2.9 Record keeping – the logging of cleaning activities and results obtained.

3.0 Scope of work

The scope of work for pre-commission cleaning of newly installed systems should be compliant with the client's specification, industry guidance (e.g. BSRIA guide BG 29/2021) unless an alternative is agreed, and any additional manufacturers' requirements.

The main scope of work for a typical cleaning project should include:

3.1 Specifications – the project specification and/or industry guides which must be complied with under the contract terms.

3.2 Design/installation review – a review of the project information to enable the Service Provider to prepare a quote and once the contract has been agreed to identify in advance, any modifications required to facilitate the cleaning process (see section **4.0** below).

3.3 Cleaning stages - the cleaning stages and activities to be undertaken as part of the Service Provider's contract e.g. debris removal, bacteria/biofilm removal, pipework surface cleaning, system passivation, water quality monitoring, etc (see section **6.0** below).

3.4 Chemical data sheets - details of the chemical products to be used, their constituents, control parameters and test frequencies.

3.5 Cleaning method statement – system specific written procedures describing the operational approach to achieving compliant water conditions within new systems (see section **5.0** below).

3.6 Programme – an agreed programme and resource allocation chart for the works agreed with the main contractor.

3.7 Reporting - a clear set of pre-identified deliverables should be provided detailing the checks and procedures undertaken and their outcomes (see section **7.0** below).

4.0 Design/installation review

Client information

The client will need to provide drawings and specifications for the project to allow the Service Provider to accurately quote for the cleaning works. The same information should form the basis of a design review whereby the Service Provider highlights any aspects of the pipe system design that are not conducive to pre-commission cleaning or water quality maintenance thereafter. This may include (but is not limited to):

4.1 checking flushing facilities e.g. fill points and drain points, bypass arrangements etc.

4.2 ensuring protection of sensitive plant items, terminal devices and valves;

4.3 consideration of the materials of construction (e.g. thin walled carbon steel or aluminium);

4.4 plans for ongoing pressurisation and circulation of water after completion of the flushing both before and after balancing and practical completion.

Site Survey

The Service Provider should visit site at appropriate intervals during the installation and immediately prior to cleaning to ensure that all necessary flushing provisions are included and the installation complies with the principles laid out good practice guidance (e.g. BSRIA guide BG 29/2021).

The Service Provider should fully document their findings in relation to sections 4.1- 4.4 above and issue to the client. The Service Provider should document any concerns that they have which may impact on the outcome of the pre-commission clean. They should also list any outstanding information that is required before works can commence.

5.0 Cleaning method statement

The Service Provider should provide a detailed system/site specific method statement for the initial filling of the system and subsequent system cleaning. The method statement should address (but not be limited to):

5.1 procedures for the removal of particulate matter (by means of elevated flow rates) i.e. achieving the necessary flushing flow rate in every section of pipework;

5.2 plans for controlling and minimising the risk of microbial contamination during the clean and up to project handover;

5.3 procedures for the chemical cleaning and passivation of steel pipework surfaces;

5.4 maintenance procedures for the control of water quality after completion of the clean;

5.5 procedures for monitoring of water conditions (by means of regular sampling) after completion of the clean and until Practical Completion.

The method statement should outline the overall cleaning strategy and then detail each individual stage. The cleaning method should comply with up to date good practice guidance (e.g. BSRIA guide BG 29/2021).

The method statement should:

- reflect the size of the pipework being cleaned;
- be tailored to address the particular components in the system;
- be tailored to address the particular materials present in the system;
- indicate chemical selections that take into account cleaning objectives, system components and materials (note: approval of the chemicals selected should be sought from manufacturers of pipework and plant and copies of the approval retained and available for inspection);
- detail the samples that are to be taken on completion of the cleaning and through until until Practical Completion;
- detail the sampling procedure and method (e.g. by specifying compliance with BS8552);
- state whether system or temporary pumps are to be used and explain how flushing velocities will be maximised, measured and recorded.

6.0 The cleaning process

The Service Provider should not commence work until systems are complete and all necessary flushing provisions have been provided. The Service Provider is to inform the client, in writing, of any implications if this is not the case.

The Service Provider must comply with all health and safety aspects of the work on site, and any documents in relation to health and safety (such as chemical product safety data sheets) are to be made available for inspection.

Prior to works commencing it is essential that an effluent permit is available. This would normally be obtained by the water treatment contractor. A copy is to be retained with the documentation.

The method statement is to be adhered to and any deviations / alterations that become necessary are to be agreed in writing with the client. If necessary, a new method statement is to be written.

Full records are to be kept of each stage of the clean and monitoring period.

7.0 Records/deliverables

The final pack of information provided by the Service Provider to their client on completion of the clean should include (but not be limited to):

7.1 records of initial fill water conditions (i.e. during pressure test);

7.2 the pre-clean design review;

7.3 the cleaning method statement;

7.4 flow record sheets for recording flushing flow rates achieved during dynamic flushing (and these should relate to specific pipework sections);

7.5 product safety data sheets for chemicals used;

7.6 chemical test sheets recording the progress of the cleaning stages;

7.7 chemical dosage record sheets recording times and quantities of each chemical dosed;

7.8 strainer records recording time and content of strainer inspections;

7.9 backflush records recording visual condition of water flushed through terminal devices;

7.10 chemical and microbiological results for samples taken after the clean to show compliance with good practice guidance (e.g. BSRIA guide BG 29/2021);

7.11 trend information for water analysis results.

The Service Provider is to keep copies of all documents for a minimum of 3 years (or longer if required by their contract).

These documents should be available for external audit.

8.0 System Handover at Practical Completion

The Service Provider is to provide ongoing maintenance recommendations for inclusion in the Practical Completion documentation together with any necessary recommendations for on-site training or minimum competency.

The names and providers of all water treatment chemicals used for ongoing protection of the systems are to be supplied.