BIOTECH LOW TEMPERATURE HOT WATER PIPEWORK REPLACEMENT PROJECT SPECIFICATION

Introduction

The Medicines and Healthcare products Regulatory Agency is an Executive Agency of the Department of Health established on 1 April 2003. We have around 1,270 staff, with a total budget of approximately £150 million. We protect and improve the health of millions of people every day through the effective regulation of medicines and medical devices, underpinned by science and research.

Scope

National Institute for Biological Standards and Control (NIBSC)

The institute is a world leader in assuring the quality of biological medicines through product testing, developing standards and reference materials, and carrying out applied research. The Biotech building has several laboratories and office suites, two containment level 3 laboratories that supports research to achieve the objectives set out in NIBSC's Science Strategy and Agency's Corporate Strategy 2018 – 2023. The building is supported by a central plantroom which houses all the air handling units, LTHW pipework, DHW supply to laboratories, steam supply and its ancillaries. This project is set out to replace the aged LTHW pumps and pipework and take the opportunity to upgrade LTHW system up to be compliant. This project is part of the infrastructure – site updating portfolio approved, by SMT as part of the 22/23 capital program to address priority issues at the South Mimms site.

Specification

This project is ideally suitable for a contractor who has the knowledge of utilising TREND BMS system to monitor and control various flow rates with regards to air handling units within a facility and particularly working within a live operational facility. Within the Plant Room, there are seven air handling units each with LTHW heating coils, five of which also have LTHW frost coils. The system was recently recommissioned, and this identified problems with the existing valves and pipework, they could not be adjusted without leaking. It is, therefore, the proposal of this project to replace them. The other concern is that the main pipework is installed in carbon steel which has been drained down several times that could influence the degrading of the pipework. Thin wall carbon steel tubing is more susceptible to corrosion failure. Corrosion can progress to an advanced stage much more quickly than would normally be expected leading to unexpected failures in the pipework in as little as six months.

In a copper pipework system, the dissolved oxygen in the system water will rapidly be used up as it reacts with the large area of surface, the loss of metal thickness on thin-walled carbon steel can be significant. Due to problems within the system, we know that the system has been partially drained and left whilst emergency works have been carried out. As such, we need to eliminate the risk of failure of the system which could cause considerable damage to the laboratory area below. All carbon steel pipework is to be replaced with copper pipework and Xpress fittings. With respect to the heating pump this has also been an issue and does not provide the correct water flow. The pump set is to be replaced with a new pump set with run and standby pumps to be supported individually by the new Vacon Inverters which are our site standards. We do not allow integral inverters, but the pumps will be driven by Vacon 100 flow type inverters.

We also know that the UK stem cell building has a problem getting to temperature after the system has been isolated and, in the winter, this can be a problem as the main air handling units are operating on full fresh air. The hot water flow and return to this building has been poorly installed and made complicated through several leaks on the system. The new pump set is to select with a flow rate to meet the air handling unit and the radiator requirements, plus 15% flow and 10% pressure. The contractor will have the responsibility of ensuring the existing plate heat exchanger can supply the required volume of hot water at the right level of flow rate. All insulation is to be replaced with 40mm foil faced mineral fibre sections complete with aluminium cladding at levels below three meters. All valves are to have removable insulation bags fixed with Velcro and ties. Pipework is to be flushed and treated upon completion of the installation. Following flushing and venting, the system is to be re-commissioned.

The contractor shall also replace the flow and return hot water pipework from the Biotech plantroom supplying the UK stem cell building. There is always a massive leak when the system is turned off that regularly damages the ceiling tiles below the pipework. The mechanical contractor should allow for the BMS contractor to disconnect and reconnect all sensors, recommission upon completion. Operating and maintenance manuals must be updated and form part of the hand over documentation complete with all commissioning test sheets. Access to the Plant Room shall be via a scaffold to be erected at the back of the plantroom. This will allow the contractor to load all materials via the route without disturbing the staff access.

Upon completion, the Plant Room shall be thoroughly cleaned and signed off by the NIBSC engineer. All waste material to be removed from site and waste transfer notes issued. The mechanical contractor shall ensure that all building penetration will be filled and certified with the right fire-retardant materials and all building fire compartmentation identified. The contractor shall quote and supply at

least two spare control valves, manual valves, actuators and strainers. Access to the building will be via the road and pathways, or through a designated corridor and up the integral stairs to the laboratory and corridor, up to the next level provides access to the plant room which is only accessible to approved personnel using the access card to be provided.

Trend Controls

The BMS contractor shall update the graphics with the changes to the pumps, inverters and plate heat exchangers where required. New Vacon inverters to be driven and connected to Trend BMS. The contractor must be confident with working within an operational research facility with minimum disruption to operations during the execution stage of the project. The recommended contractor for the site BMS is:

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Richmond House, Manchester
M33 6BB

The list of the mandatory requirements is shown below, kindly note that this list is not exhaustive and additional requirements that will improve the performance of the system can be added but nothing can be SUBTRACTED from these requirements.

Mandatory

- There are no strategic zone isolation valves on the system flow and return pipework. Every time there is a leak the entire system is affected, as individual legs cannot be isolated. The contractor shall ensure the introduction of strategic zone isolation valves within the system.
- The contractor must replace all pipework components, - isolation valves, regulating valves, control valves, strainers, non-return valves, drain cocks and binder points on all the air handling units.
- The plate heat exchanger, circulating pumps and pipework needs to be sized to suit the correct flow rates for the Biotech and UKSC buildings.
- The contractor shall ensure the Inverters supplied with the pumps are NOT integral but individual Vacon 100 flow type inverters.
- All insulation is to be replaced with 40mm foil faced mineral fibre sections complete with aluminium cladding at levels below two meters. All valves are to have removable insulation bags fixed with Velcro and ties.

- The mechanical contractor shall ensure that all building penetration will be filled and certified with the right fire-retardant materials and all building fire compartmentation identified.
- The contractor shall remove and replace the ceiling tiles and grid system along the glass walkway leading to the UKSC building after the replacement of the pipework and valves.
- The preferred building management system is TREND BMS. This is because all the current infrastructure within the Institute is fitted with TREND system and replacing them with another BMS will be an expensive expenditure.
- All redundant services are to be removed and the area left clean after the completion of the project. All plant and its subsidiary components must be easily accessible for routine servicing and maintenance. The new Installation should allow for a clear access route to and for maintaining the new plant.
- The contractor shall fill the attached risk assessment spreadsheet attached to the tender to identify possible risks in the project execution from the contractor's perspective.
- The winning contractor shall be sent the PPM spreadsheet to be filled before project completion and returned to the project engineer in charge.

Additional Requirements

In addition to the requirements stated above, kindly take note of the details about the following activities that are integral to the project.

- The proposed route of delivery into Biotech plantroom identified after the site visit must be clearly detailed within your proposal in the tender return.
- Kindly note that all new holes drilled through the slab between the plantroom and room must have a fireproof sealant sealing the hole where pipe or cable pass through.

O & M Manual

Electronic O and M manuals will be provided at the end of the works, showing as installed drawings, routine service parts and the frequency of maintenance. Electrical certificates along with information etc. on manufacturer's literature must also be included. Control panel drawings will include SET drawings for the Trend controllers.

Method of Installation

- The contractor must document the method statement that will be utilised for the execution of the project bearing in mind that the Biotech will not be vacated during the project works and out of hours work will not be encouraged.

- There will be a site visit organised for all the prospecting contractors for these works during the tendering period. The proposed site visit is scheduled for the Monday 20th of February 2023 between 10:00 – 11:00 am in the morning.