**Conversion of Fuses to Moulded Case Circuit Breaker (MCCB) For Sitewide Chilled Water System**

**Scope & Introduction**

This project aims to replace the existing 800-amp switch fuse housed in the Blewstar Low Voltage switchboard with a Moulded case circuit breaker of the same manufacturer in keeping with the site standard for the service level agreements. The existing fuse protects the 3 off 185mm 4 core SWA cables that supply the chilled water sub-main chiller and pump distribution panel within the Biological services Department facility.

**Specification**

The Moulded Case Circuit Breaker preferred will be of a Schneider type compact NS 800n amp moulded case circuit breaker with a micro logic type 5 or 2 protection relay, but we are aware of other manufacturers, so this is not limited. The functionalities of a similar brand must be superior or of the same type mentioned above.

**Method of Build**

The design, manufacture and build installation of the circuit breaker must be approved by the site electrical team lead at every stage of the project. This is due to the complexity of working around an operational site with mandatory requirement to keep the facility running due to Home Office requirements. This will be a challenge, although the site requirements for this chilled water distribution system will be low or not required at all during the winter months the chillers are called into action when the external air temp rises above 12 degrees centigrade, this project would be limited to these winter months.

The low voltage switchboard cannot be turned off for any duration of the build so this project is to consider options of building onto the existing switchboard that will be shown during the site visit. The existing switch fuse is housed in one cubicle and the cable terminations are housed in another cubicle above.

It is accepted that we may need to have a new cubicle built to house the new moulded case circuit breaker and fitted to the side of the low voltage switchboard where the power factor correction panel is currently located, the power factor correction panel can be renewed or just re-located close to its switch fuse. Both switch fuse will be able to accommodate the feed to the new Moulded Case Circuit Breaker panel. The existing chilled water switch fuse can then be utilised to feed into the new Moulded Case Circuit Breaker cubicle with the cable and joined to the existing 3 x 185 mm CSA 4 core SWA cables.

All of the above will be to BS7671 standards and industry best practice and be supported with a Trimble protect software survey to show the protection relay settings accommodate best practice electrical fault discrimination with all protective devices within the distribution circuit.

**Test and commissioning**

It is within the scope of this project to test by injection method to prove the operation and protection afforded by the new Moulded Case Circuit Breaker.

The final settings of the electronic protection relay are to be governed by a Trimble protect software discrimination survey, this software suite is licensed to NIBSC and can be made available to the principal contractors commissioning engineer if and when required for this purpose of this testing. It is the contractor’s responsibility to test and commission the new Moulded Case Circuit Breaker as required.

**Compliance**

The circuit breaker unit must comply with but not limited to the following standards, regulations and guidance.

* BS 7671 – 18th Edition IET Wiring Regulations
* HSG230 – Keeping Electrical switchgear Safe

**Method of Installation**

The contractor must document the method statement that will be utilised for the isolation and the confirmation that whole fuse unit is fully isolated for the work to begin. The installation of the new circuit breaker unit will involve adequate amount of mechanical works on site including the repositioning and cabling of the Power Factor correction panel. There will be a site visit organised for all the prospecting contractors for these works during the tendering period. The lead time for the design and manufacturing of the new circuit breaker unit must be included within the tender return.

There is a mandatory requirement to keep the facility within a set temperature. The chillers automatically run when the outer air temperature rises above 120C. A temporary chiller provision should be allowed within the tender return. All requirements and clarifications for the connection, flow and return feeds for the chiller will be discussed while on site.

The proposed site visit is scheduled for the **1st February 2021.** This is provisionally dependent on the Covid 19 rules governing the country at that point in time.

Below are current pictures of the existing fuse location and units to give you an idea of location and type of the fuse units.

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