# BIG ETP Maintenance Support Specification

## General

This document details the requirements for the maintenance support required for the Effluent Treatment Plant (ETP) located in the basement of the Biologicals Investigation Group (BIG) Building at the Public Health England (PHE) site at Porton Down. The purpose of this document is to enable prospective Suppliers to provide a tender for the maintenance support works for consideration by PHE.

The ETP receives liquid waste from the ACDP Containment Level 3 and 4 laboratories within the BIG Building and heat treats the liquid waste to decontaminate/ sterilise it prior to onward discharging to drain. The ETP system comprises three identical 1,000 litre Decontamination Vessels V1, V2 and V3 which in sequence receive the waste from all the laboratories. The vessels are located within an access-controlled negatively-pressurised containment area in the BIG Building basement (known as the “Pit”).

Once the current receiving vessel is deemed “full” (at approximately 650 litres) the subsequent incoming liquid waste is redirected to the next vessel in the queue whilst the first vessel undergoes a decontamination cycle of heating to >123ºC for 30 minutes. The heating is achieved by direct steam injection into the vessel through a dip pipe.

Following successful completion of a decontamination cycle for the first vessel the treated waste can be discharged to drain, this achieved by steam pressure. To ensure that the discharge temperature of liquid at the PHE site boundary is <40ºC, cold water is added to the hot effluent at the Effluent Ejector Unit just prior to the discharge to drain. After discharge is completed the vessel is returned to the queue to become available to receive waste again when required.

In normal operation the three vessels rotate duty in a cyclical manner (thereby balancing the use of each vessel). The facility exists however to take a vessel out of service for short periods for maintenance, calibration, etc. during which time system can operate satisfactorily with just the remaining two vessels in service.

Overall, the plant is capable of processing at least two decontamination cycles per day (approx.1,300 litres of effluent treated). The effluent being treated is aqueous based and contains chlorine-based disinfectants. No solvents are present and consequently there is no requirement for the system to be ATEX rated. The Pit area is designed to be fumigated using formaldehyde-based fumigants.

The ETP System has been subjected to a Hazardous Operations (HAZOP) Study with the objective to identify the hazards and operability issues along with any actions or recommendations for further investigation associated with the proposed process. The report thus documented potential undesirable events, existing safeguards that may prevent or mitigate such undesirable events and required actions and recommendations.

As a consequence of this HAZOP, and it’s resulting actions/ recommendations, the ETP was subject to the requirements of BS EN 61508 - Functional safety of electrical/ electronic/ programmable electronic safety-related systems and BS EN 61511 - Functional safety, Safety instrumented systems for the process industry sector.

## Equipment Schedule

**The following is a list of equipment or plant whose support is to be covered.**

The plant and systems to be supported in broad terms comprises:

* Big Effluent Treatment Plant
* Associated Local Utilities Delivery Systems
* Electrical and Instrumentation Systems
* ETP mechanical systems
* ETP Control System;
  + Allen Bradley Control Logix PLC System, 1 off
  + SCADA System PCs with Intouch, 3 off

## Condition of equipment.

All plant and components are in good working order. Intermittent faults and all other repeating problems will be, where possible, made known to the tenderer during the process.

Please note that all equipment is outside its warranty period.

## Scope of Cover

**ETP Support:**

Support in this context means the provision of specialist support directly for a three year period on,

1) The plant control and automation system.

2) The day to day operation of the plant on site.

3) Calibration of instruments

4) Provide Technical and logistical support/management in thermal mapping of the vessels to prove functionality of the ETP System

5) Mechanical shutdowns work including Seal and Diaphragm changes and support of Insurance inspections under the Pressure Systems Safety Regulations 2000 (PSSR)

6) Technical and logistical support/management on and off site of specialist maintenance or project works outside of day to day maintenance or operations.

7) BS EN 61508/ 61511 Functional Safety Asset lifecycle technical support

8) A site presence over the full working year, continuous for working days but excluding 25 days holidays.

9) Local stand by support during those 25 days holidays.

**Control System:**

The support should cover,

1) The support of Standard Operating System software and process specific application software (PLC/SCADA code).

2) The overall control system used to operate the ETP.

3) Housekeeping in terms of site facilities, PLC cabinets, system backups, version control, operation of a fault log and recommendations on continuous improvement.

**Breakdown Visits:**

Should the plant or one or more of the components listed on the ETP fail to operate, the contractor will, in the first instance, try to remedy the problem on site, via telephone support and then if necessary through site visits by specialists locate the cause of the problem and rectify same.

**Response Time:**

In the event of a system breakdown where the requirement for specialist assistance is identified the contractor will have a service engineer either on site, travelling to site or working to resolve the reported problem at a remote location within the following time frame. Response times are to be for 24 Hours, Saturday and Sunday included (Excl. Bank Holidays) - 4hrs

**Support:**

The cost of support is to be included in the tender

Telephone support should be available during normal working days Mon-Fri (9.00 – 17.00). After hours calls should be checked during normal working hours and responded to accordingly.

Out of Hours Support:

An option for out of hours support (24hours, Saturday and Sunday) should be included in the pricing structure.

**Spares Holding**.

Should one or more of the components on the ETP fail to operate the replacement part of equivalent component will be held in stock by the PHE.

**Spares Charge.**

Should one or more of the components on the ETP fail to operate the cost of purchasing a replacement component, or repairing the existing component, or providing a reconditioned unit, will be paid by the PHE

**Preventative Maintenance (PM) Visits**:

The contractor will have an operative on site as outlined above who will conduct PM on a routine and ongoing basis, for the purposes of development and management of a preventative maintenance programme the contractor is to provide a specialist presence on site 12 times per year.

PM visit to include but not be limited to the following:

* Visual inspection of plant and components.
* Assessment and review of plant and equipment performance.
* Replace PLC Battery.
* Calibrations.
* Functional Safety Proof testing of Safety Integrity Loops (SIL)
* SCADA/PLC uploads and backups
* Archive data and ensure sufficient capacity on the hard drive for the next 12 months
* Report preparation (to client) and PM programme management.
* Identification and management of any third party specialist input requirement.

**Access to System:**

The contractor shall be granted full and free access to the plant for the duration of the contract.