Annex A to
DSTL/AGR/01243/01
Dated 16 Sep 21

STATEMENT OF REQUIREMENT FOR A MAINTENANCE, REPAIR AND SUPPORT CONTRACT FOR THE INCINERATOR FACILITY

Introduction

1. Dstl operates a hazardous waste incinerator facility at its Porton Down site. The Environment Agency (EA) have issued a permit for Dstl to operate this facility which is used to dispose of a variety of waste streams that include:

[redacted];

- waste from OGDs (Other Government Departments); and
- waste from private companies.

Background

2. This section describes the incinerator facility located at Dstl, Porton Down, Salisbury, Wiltshire SP4 0JQ

   a. The facility has two primary chambers, a rotary kiln with a capacity of approximately [redacted] per hour, and a Hoval chamber. The Hoval is used for incinerating liquid waste and items that are too large for the kiln.

   b. The rotary kiln is served via a waste loading system. Waste is loaded into the kiln via 205 litre bins that are mechanically lifted and then tilted to open into a hopper. The hopper is then closed and a firewall between the hopper and kiln is lifted. The waste is then pushed into the kiln by a hydraulic ram.

   c. The rotary kiln was replaced in November 2020.

   d. There is a liquid disposal system which is used to feed hazardous liquid waste into the Hoval.

   e. The primary chambers are connected to an afterburner system.

   f. The secondary chamber ‘Afterburner’ is maintained >1100°c and is an Environment Agency (EA) permitted temperature requirement.

   g. After being thermally treated in the afterburner, the gas stream is drawn through a quench tower where the gas temperature is cooled to 200°c, and then passes through a bag house.

   h. The bag house comprises a structure that houses a number of Gore-Tex lined bags impregnated with a catalyst. This treats any remaining long chain molecules in the gas stream. Lime is introduced (prior to the gas stream reaching the bags) to manage the pH levels and polish/protect the bag before the gas stream is passed through a caustic scrubber.

i. The caustic scrubber allows the flue gas stream to pass up through a reaction tower filled with multifaceted dioxin absorbing cylinders. The gas stream also reacts via a H_2O cascade using Caustic to maintain pH7.

j. There is a continuous emissions monitoring system (CEMS), which ensures that the composition of gases and particulates released into the atmosphere comply with the provisions of the facility's operating permit issued by the Environment Agency.

k. The primary chambers and afterburner are initially fuelled by red diesel to bring them up to temperature (0 to 1100 degrees C) before being switched to RFO (Recovered Fuel Oil). The fuel is stored in a fuel farm adjacent to the main incinerator building.

l. The operation of the facility is controlled by a Siemens Step 7 PLC (Programmable Logic Controller) and accessed via human machine interface (HMI) and supervisory and data acquisition (SCADA) screen.

m. All high temperature switchgear used to operate the facility is pneumatically controlled by means of a compressed air system.

n. A new incinerator facility is being planned but this will not reach full operating capability until at least 2025. It is essential that the existing facility is kept operational until then.

o. The existing facility has been in continuous operation for over 20 years. A programme of works is being planned to ensure the capability continues to operate for at least 5 years.

p. As part of the development of the options for a new facility, Jacobs Engineering were engaged to undertake a survey of the condition of the existing incinerator. The condition report and recommendations will be made available to prospective bidders on request.

Requirement

3. This section defines the requirement and scope of the maintenance and support contract for the incinerator facility. The high-level requirement is to provide mechanical, electrical engineering and PLC support to deliver planned preventative maintenance (PPM) and reactive support in accordance with the service levels defined in this document.

<u>Planned Preventative Maintenance (PPM)</u>

4. Planned preventative maintenance is performed on the facility at predefined intervals and during shutdown schedule. These shutdowns typically occur every 12 weeks.

5. Planned preventative maintenance is carried out during normal business hours.

6. The scope of the planned preventative maintenance work is defined by the OEM and in the mandatory shutdown list, which is included in Appendix 1. The mandatory shutdown list details the works to be undertaken during each shutdown. The work to be performed changes depending upon the service schedules recommended by the OEM and any regulatory requirements,

7. The service provider will attend and supervise start-ups of the facility following planned shutdown works.

8. The service provider will manage the testing of the functionality of the Emergency (Estops) controls and testing regime.

9. The service provider will be responsible for the upkeep including painting and weatherproofing to prevent environmental deterioration of in-scope items.

10. The service provider will be responsible for installation and maintenance of certified instrumentation.

11. The service provider will be responsible for calibration and certification of plant production instrumentation.

12. The service provider will be responsible for ensuring that plant process instrumentation is tested and maintained in accordance with the manufacturers' specifications.

13. The service provider will arrange for periodic inspection of all refractory linings and for any repairs to be conducted.

Reactive Support

14. The service provider must be available to undertake reactive support at the facility to ensure that down time is kept to a minimum.

15. The service provider is required to take the lead in diagnosing and rectifying faults, including calling upon the support from other third parties. Any third party companies engaged by the service provider shall be UK-based. Employees must be prepared to undergo clearance or background checks before admittance to the facility and must be UK nationals.

16. Reactive support for the incinerator facility is required 24/7 365 days per year including public holidays.

17. Incidents that require support will be prioritised according to table 1 below.

Incident priority	**Definition**	**Service level requirement**
P1	An incident resulting in a complete shutdown of the incinerator and it is not possible to restart the facility. There is an urgent business imperative to resume operations as quickly as possible. The engineer attending site must be familiar with the plant and process. (prior experience of the site operation)	Initial telephone response to acknowledge incident within 1 hour (24/7) Engineer on site within 2 hours of the original call being placed if the incident cannot be resolved over the telephone.
P2	The incinerator is shut down and there is not an urgent business imperative to resume operations within 4 hours, or it is operating at a reduced capacity or is at risk of a complete shutdown due to a failure in a redundant component. The engineer attending site must be familiar with the plant and process. (prior experience of the site operation)	Initial telephone response to acknowledge incident within 1 hour. Engineer onsite within 4 hours of the original call being placed if the incident cannot be resolved over the telephone.
P3	A component that has failed or is about to fail that cannot wait until the next planned engineer visit.	Acknowledgement within 1 hour. Engineer onsite next day (maximum of 14 hours).
Non-urgent	All other support calls	Acknowledgement within 1 business hour.

		Incident to be addressed during weekly scheduled visit.

Table 1. Reactive support service level requirements

18. The availability for the incinerator facility must exceed 95% between shutdowns. The following deductions to the maintenance charges will apply if availability falls below the thresholds shown in table 2 below. Service levels will be discussed at the quarterly service review meeting.

Incinerator availability	**Maintenance charge deduction**
Greater than 95%	No deduction
90%-95%	20 % deduction
Less than 90%	50% deduction

Table 2 – Service level thresholds and deductions to be applied

19. Dstl reserve the right to increase or decrease the priority of an incident after a support call has been placed. A formal email will be sent to the service provider to confirm the priority after the initial phone call. Regular site attendance for maintenance and support activities and planned preventative maintenance.

20. The facility has a requirement for the service provider to supply a suitably qualified and experienced engineer to attend site on a weekly basis, on average 1 day per week during normal business hours to undertake day-to day maintenance and non-urgent repair tasks outside of the PPM cycle.

21. For PPM activities the service provider must provide a maintenance schedule which is entered onto the Shire Pirana system and defines the tasks, frequency and expected duration of planned maintenance activities.

22. On average there are four planned shut downs per calendar year with a duration of between 5 and 10 days depending on the amount of work required. Attendance is required for the duration of the planned shutdowns.

23. Appendix 2 lists the planned preventative maintenance dates. These dates are subject to change depending upon operational requirements.

24. The timing of PPM activities must be agreed with Dstl beforehand in order to avoid scheduling conflicts.

Documentation

25. The maintenance provider must update the facility's maintenance records in order to comply with the extant legislation and licenses.

26. Maintenance records are held on a computerised maintenance management system called Pirana from Shire systems.

27. The service provider must update maintenance records on Pirana.

28. The service provider will be granted access to Pirana via a tablet computer issued by the maintenance manager. The tablet shall be returned to the maintenance manager at the end of each day.

29. Copies of all documentation generated or supplied relating to the incinerator facility will be required in the following electronic formats: .xls,.xlsx (excel), .doc (Microsoft Word) and .pdf (Adobe Acrobat).

30. All documentation must be provided in an editable file format.

31. All changes, updates, replacements are to be in agreement with Dstl and must be documented using the Dstl incinerator change control process. An example change control form is shown in Appendix 3

32. All documentation and data is the property of Dstl.

Qualifications and experience

33. Table 3 below lists the qualifications and experience required for engineers supporting the facility.

Qualification	Requirement
Electrical / electronic engineering to HND level (degree preferred).	Mandatory
Confined space working	Mandatory
Working at height	Mandatory
PSSR (Pressure Safety Systems) 2000	Mandatory
DSEAR	Mandatory
COMPEX	Mandatory
British Standard BS 7671 "Requirements for Electrical Installations. IET Wiring Regulations" 17th Edition	Mandatory
Mechanical engineering to C&G or NVQ level 3	Mandatory
Manual metal arc (MMC) welding to C&G or NVQ level 3	Desirable
Metal Inert gas welding to C&G or NVQ level 3	Desirable
Trained and competent in the use of Computerised Maintenance and	Mandatory

Management Records systems such as Shire Systems Pirana.	
Provision and Use of Work Equipment Regulations (PUWER)	Mandatory

Table 3: Qualifications required for providing engineering support.

34. Engineers must be UK nationals and be prepared to undergo security vetting.

Critical Spares

35. Critical spares for the incinerator held at the facility. These items have a long lead time and are held in stock to ensure that they are on-hand to minimise down time and subsequent loss of capability.

36. The service provider is to manage the spares inventory on behalf of Dstl. The current list of critical spares is shown in Appendix 4.

37. The service provider must replace any critical spares used with like for like components.

38. The critical spares list will be reviewed periodically by Dstl and the service provider and any changes to the critical spares inventory will be agreed between Dstl and the service provider.

39. Dstl will own all critical spares.

40. The service provider can purchase critical spares on behalf of Dstl with the agreement of the incinerator team leader as described in "Replenishment of Critical Spares" below.

41. Dstl reserve the right to purchase spares directly.

42. The critical spares inventory is to be maintained on the Shire Pirana system.

Non-critical spares

43. The service provider can purchase non-critical spares on behalf of Dstl with agreement of the incinerator team leader.

44. Dstl reserve the right to purchase spares directly.

Replenishment of Critical Spares

45. The incinerator facility keeps a stock of critical spares on site to ensure down time is kept to a minimum. When a critical spare is used, it must be replaced with a like for like item as soon as possible. Dstl reserves the right to source critical spares. If the service provider is asked to procure high-value items, then evidence will be required to demonstrate that a competition has been undertaken to demonstrate value for money supported by documentary evidence.

46. There are certain critical spares that Dstl would prefer the service provider to purchase on Dstl's behalf in order to ensure that the correct specification of spare is procured. When a critical spare needs to be replaced, the following process must be followed:

    a. A written quotation for the replacement of the critical spare must be provided to the incinerator maintenance manager.

    b. The team leader or his deputy must approve all critical spares purchases.

c. Subject to the approvals above, the service provider can order the spare and arrange for its delivery to the critical spares store.

d. On delivery of the spare, the service provider will invoice Dstl for the critical spare plus delivery charges and administration charge.

Replacement of facility components

47. All critical and non-critical spares must be from Dstl's preferred manufacturers (for example, Endress & Hauser), as directed by the Dstl maintenance manager. All replacements must be like for like.

Advice and consultancy

48. The service provider must ensure that SoPs (Standard Operating Procedures) are amended to reflect changes made following incidents or maintenance work.

49. The service provider must be able to advise on installation best practices and best available technology (BAT).

50. The Service provider must undertake horizon scanning with respect to the incineration industry and legislation.

51. The service provider must provide mentoring, training and skills transfer to members of the incinerator facility staff.

52. The service provider must assist with the development or amendment of SoPs to assist facility staff with diagnosing and rectifying faults.

53. The service provider must provide advice and assistance to ensure that any actions from audits are discharged.

In-scope items

54. Table 4 below lists the items that are within the scope of the maintenance contract. Items not listed are deemed to be out of scope.

Afterburner
Burner
Combustion / cooling air fan
Controls
Fuel delivery system and controls
Instrumentation
Refractory lining
Thermocouples
Valve controls
Baghouse
Bag house structure

Baghouse duct and isolation valve
Bypass duct and valves
Bag House heater element and electrical supply.
Electrical heater fan
Gore-Tex bag and cages
Instrumentation and control systems
Plenum insulation
Pneumatic blowdown system
Rotary valve
Thermocouples
Trace heating
Caustic storage
Bund
Visual and digital level gauges
Tank (T08)
Heating element
Transfer system
Control systems
Human Machine Interface (HMI)
Ductwork
Lagging and external covers
Effluent water
Catch tank (T03)
Controls
Filters
Instrumentation and control panel
Pipework
Pumps
Storage tanks (T06 and T06A)
Tank and pipework lagging
Valves
Drainage system
Electrical supply

Process electrical supply
Fuel Farm
Bund pumping system
Bund pumping system lagging
Bund pumping trace heating and electrical supply
Controls
Fuel delivery points
Manual level gauges excluding T02A analogue gauge.
Pipes
Pumps
Alarm systems
Hoval
Refractory lining
Door control system
Electrical supply
Fuel delivery system and controls
Hoval isolation valve
Thermocouples
Valve controls
Control panel
Incinerator facility
Machine guarding (PUWER)
Kiln
Control systems (e.g. position sensors)
Control panel
Kiln rotational control panel
De-ash system
Electrical supply
Fuel delivery system and controls
Kiln fire door
Kiln hopper
Kiln head
Kiln isolation valve

Loading ram
Primary air fan
Primary drive
Rotary kiln
Support structure including rollers, bearings and levelling.
Thermocouples
Refractory lining
Fire seals
Valve controls Kiln water quench system
Access interlock system
Lime injection system
Control systems
Control panel
Fan
Pipework
Rotary delivery system / valve
Liquid disposal system
Control Systems
Gauntlets and seals
Injection lance
Instrumentation
Interlocks
Mains cold water system
Pneumatic control systems
Pumps
Structure
Valves
Main barn B425
Spillage catch tanks control and alarm systems
Control panel
Instrumentation
Miscellaneous

Inverters
CCTV system
SMS alerting system
All filters and valves
Fuel flow monitoring and recording control panels
All communications from field instrumentation to the PLC
Quench systems
Emergency relief valve
Quench tower structure
Brackets
Ram and controls
High pressure water systems
Lute tank
Quench elbow
Thermocouples
Valve controls
Scrubber
Adiox
Caustic injection
Demister
Emergency quench system
Filters
Level gauge
Flow meters
pH control system
Motors
Pipework
Pumps
Scrubber elbow and ducting
Scrubber pumps
Structure
Thermocouples
Valves

Stack
Stack structure
Emergency quench system
Stack ID fan
Stack liner
Trip alarm panel
SIL certification
Trip Alarm Control Panel
Pipework, ladders, walkways and gantries
Lagging
Pipework inspection and maintenance
Pipework designation colour and tagging Ladders, walkways and gantries throughout the facility

Table 4: In-scope items.

On call and call-out for reactive support

55. The incinerator facility runs as a 24/7 operation. Consequently, there is a requirement to ensure that it is possible to call upon the service provider for support if an incident occurs.

56. If an incident occurs which requires reactive support, the incinerator team will call the service provider and provide the following information:

    a. The nature of the problem or incident;

    b. The priority of the incident (i.e. P1, P2, P3 or Non-Urgent) as defined in table 1 above.

57. The incident will be recorded by the Deputy Shift Leader in the shift log. The response time measurement will begin from the time of the initial telephone call to the service provider.

58. When the incident is resolved the service provider will complete a site visit report which will detail:

    a. The nature of the incident

    b. Steps taken to resolve the incident

    c. A list of critical spares used to resolve the incident

    d. A breakdown of the costs (time and materials)

    e. Suggested amendments to existing SoPs or creation of new SoPs

59. On receipt of the site visit report, the maintenance manager will complete a Task Authorisation Form (TAF), which will be signed off by the incinerator team leader and service provider.

60. An example of a blank TAF is given in Annex E.

61. The change control form must be raised and the maintenance records updated.

62. A purchase requisition will be raised to enable payment of the costs incurred during the incident on receipt of an invoice from the service provider.

Planned maintenance, repair and support

63. The incinerator facility has a requirement for the service provider to provide suitable qualified and experienced engineering support to undertake planned maintenance, repair and support activities.

64. Visits to site for planned maintenance, repair and support activities must be pre-agreed with the maintenance manager, his deputy or the incinerator team leader or be in the planned preventative maintenance plan.

65. A change control form and TAF must be completed for the planned maintenance activities.