Use this page to add your company's normal front sheet for document control including title (*OTNOC Management plan for the X plant*), operator name, permit number, version number, author, approved by, date, review date etc.

Please also delete the text in the box below and edit the text in the header and footer of this document accordingly.

UK Regulators' Waste Incinerator and Co-incinerator OTNOC Management Plan Template

Version: 1.0

Date: 04/12/24

Contents

1. Purpose of this document

The 2019 Waste Incineration BAT Conclusions (WI BATCs) require operators to have a management plan for other than normal operating conditions (OTNOC).

The significance of OTNOC is that the BAT-associated emissions levels (BAT-AELs) specified in the WI BATCs do not apply during OTNOC. This means that the duration and frequency of OTNOC must be minimised as far as practicable, and the BATCs also require certain monitoring to take place during OTNOC.

It is the responsibility of the environmental regulator to define OTNOC as there is no definition in WI BATCs. This document summarises the UK Regulators' definition of OTNOC and provides a template which operators can use to produce an OTNOC management plan.

2. How to use this document

Operators can use this document to develop their own OTNOC management plans, either by using it as a template and retaining the existing format and sections, or by copying and pasting the relevant sections into their existing management system documents.

3. What is the UK Regulators' definition of OTNOC?

OTNOC is defined in the UK Waste Incineration BAT Conclusions Interpretation (WI BATCs ID) as periods when the plant is in start-up, shut-down or abnormal operation.

Start-up and shut-down

Start-up and shut-down are defined in further detail in separate guidance (see Environment Agency guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators), but can be summarised as the periods of the time at the start or end of the plant's operation respectively when it is unreasonable to expect the operator to comply with their emission limits due to high oxygen levels compared to normal operational conditions (leading to unrealistic correction factors), and/or unstable emissions.

Abnormal operation

Abnormal operation (AO) is defined in permits as any technically unavoidable stoppages, disturbances, or failures of the plant or the measurement devices.

In practice this means that any type of plant failure which could affect emissions can be counted as AO, but noting that:

- AO cannot be claimed for exceedances due to waste composition or operator error.
- AO cannot be claimed for exceedances of the normal carbon monoxide (CO) or total organic carbon (TOC) limits or the higher limit for particulate matter, nor for the failure of the CEMS for these pollutants (unless a surrogate monitoring method has been agreed and is available). This is because the operator must still be able to demonstrate full control of combustion during AO (indicated by TOC and CO ELV compliance), and acceptable levels of particulate emissions.

For more information on AO, see the Waste Incineration BATCs Interpretation Document (Tab 12 App3 – AO). The Environment Agency will develop updated internal guidance on AO in due course

which will also be shared with operators, but the information set out in the UK WI BATCs ID will be sufficient for operators to produce an OTNOC MP.

Other OTNOC situations

Activation of emergency release valves

Most incinerators are fitted with emergency release valves (ERV) which are used to protect the boiler and/or abatement equipment in the event of an emergency such as low water or power loss. We expect Operators to design and manage their plants so that the activation of ERVs is a very rare occurrence, and permits will allow for ELVs to be disapplied during their operation.

ELV breaches not covered by abnormal operation provisions

Other more common scenarios such as problems with waste composition which may give rise to ELV exceedances (commonly CO and/or TOC), but which cannot be classed as abnormal operation, should also be included in an OTNOC management plan, as it is clearly BAT to ensure these are minimised as well. Note that ELV exceedances under such situations will be counted as permit breaches and scored accordingly.

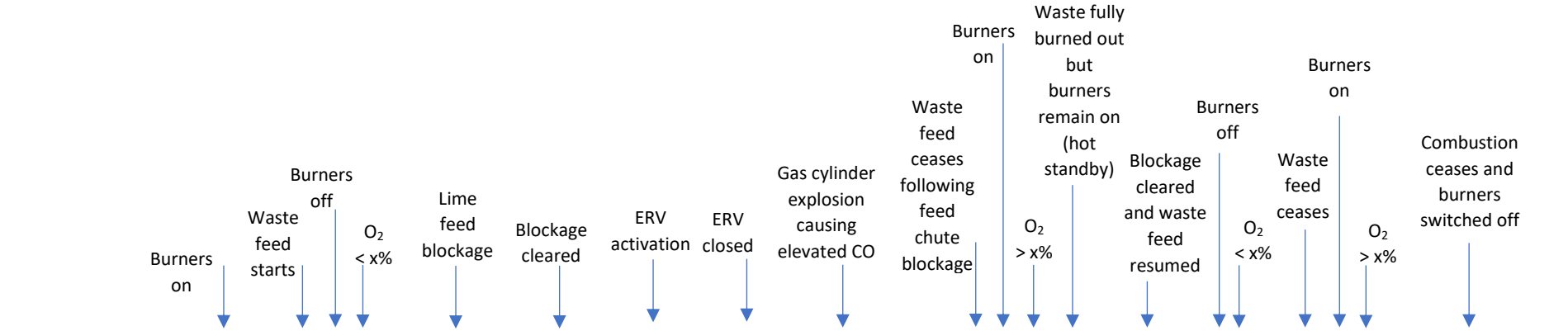
Emergency shut-downs

It is not possible to write a plant-specific definition for an unplanned (emergency) SD, since these will be inherently variable and difficult to anticipate. However, the Environment Agency's guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators includes a section to help compliance officers decide whether any apparent ELV exceedances which occur during these events should be scored as a permit breach, whereby the general definition of an emergency SD is an event involving loss of combustion air. Operators should of course also use AO provisions where these can be applied.

Environment Agency operational phases diagram

Figure 1 below shows the different operational states of a typical plant, including when permit ELVs apply, and some examples of OTNOC events which may occur during the operational time. Note that other UK regulators may take a slightly different approach to ELV application.

Figure 1 – plant operational phases



Operational phase	Plant off	Pre-start-up	Start-up	Normal operating conditions	Abnormal operation	Normal operating conditions	Emergency release valve	Normal operating conditions	Other OTNOC	Normal operating conditions	Shut-down	Start-up	Normal operating conditions	Shut-down	Plant off
Status	Off	Non-op	Operational (waste being burned)								Non-op	Operational (waste being burned)			Off
ELVs apply?	N/A	No	No	Yes	Abnormal operation ELVs	Yes	No	Yes	Yes	Yes	No	No	Yes	No	N/A

TIME (not to scale)

4. What do the Waste Incineration BAT Conclusions say an OTNOC management plan must contain, and how is this reflected in the template?

BAT 5 and BAT 18 set out the requirements for monitoring during OTNOC and the requirements for an OTNOC management plan (MP) respectively. They are duplicated in Appendix 1 and are summarised in the Table 1, along with how the template covers each of the requirements.

Table 1 – OTNOC requirements from the Waste Incineration BAT Conclusions

Summary of requirements	How this is covered in the OTNOC MP template
Identification of potential OTNOC scenarios, their causes and consequences, and to ensure that this list is regularly reviewed and updated	This is covered primarily by the list of abnormal operation (AO) scenarios list in Section 5 of the template. The list should also include scenarios which are not abnormal operation (for example because they could lead to a CO or TOC breach or a complete plant trip) as it is BAT to ensure that all events which could lead to elevated emissions are minimised. Permits will indicate the frequencies at which these sections should be reviewed. Start-up and shut-down definitions are covered in Section 5 of the template.
Ensure that equipment has been appropriately designed to minimise OTNOC	This should include a reference to any relevant info from the original permit application, but is otherwise covered in the abnormal operation scenarios in Section 6 of the template under measures for redundancy and planned improvements.
Use a preventative maintenance plan for critical equipment	Permits already require the plant to be operated in accordance with a management system that includes a preventative maintenance plan, and so this can instead simply be referenced to in Section 6 and does not need to be duplicated within the MP. Operators should still ensure this is periodically reviewed, including in response to relevant AO events.
Monitoring and recording of emissions during OTNOC and periodic assessment of those emissions, including implementing improvements where relevant	The UK WI BATCs ID sets out the requirements for monitoring during OTNOC i.e. dioxins and dioxin-like PCB monitoring during start-up and shut-down, and using data from the CEMS for the purposes of establishing emissions profiles to inform SU and SD definitions. Section 7 of this template provides information on when dioxins monitoring is scheduled, a summary of the results, and commentary on the results including any improvements identified. See also separate guidance and report template entitled "Environment Agency information note for operators of waste incinerators and co-incinerators on monitoring dioxins during start-up and shut-down" (01/11/24 or as subsequently updated).

5. Plant start-up and shut-down definitions

Notes for completion

- This section sets out the bespoke start-up and shut-down definitions for the plant. These are important as start-up and shut-down are a form of OTNOC and ELVs do not apply during these periods. The definitions should therefore be drawn as tightly as possible (based on historic emissions profiles from start-up and shut-down periods) to minimise the time when ELVs do not apply, whilst ensuring that periods of unstable emissions and high oxygen concentrations are not included within normal operating conditions (see Figure 1 above).
- For more information, please refer to the current version of "Environment Agency guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators".
- All of the text in this section can be regarded as exemplar text. Please read the drafting notes for further advice and amend, add to, or delete the current text as appropriate.

Start-up and shut-down definitions

Date of last review:	DD/MM/YY
Next review due:	DD/MM/YY
Site start-up & shut-down procedures document reference no.	Document ABC123

Start-up

Start-up effectively comprises 2 phases. The first is pre-start-up, which are the steps which need to take place before waste feed can begin. The second is start-up itself, which is the point from which waste feed begins up until the point when the plant must start complying with its ELVs (i.e. until the end of start-up and commencement of normal operating conditions, also known as "CEMS reportable"). Table 2 below defines the criteria which must be met before waste feed can begin, and Table 3 lists the criteria which must be met for the plant to be considered to be under normal operating conditions.

Table 2 - Pre-start-up and beginning of start-up

	Criterion	Justification
Before the support burners can be lit, all* of the listed criteria must be met	The CEMS are operational	CEMS must be operational in order to establish the emissions profiles of continuously monitored pollutants during OTNOC.
	Other (Please complete or delete row as applicable)	(Please complete)
Before waste feed begins, all* of the listed criteria must be met	The support burners have been lit and the ID fan and air supply fans are in operation	Standard requirement for combustion of support fuel and warming of the furnace.
	The bag filters have been coated with a sufficient quantity of lime. Introduction of lime commences once the flue gas treatment plant temperature is > [100]°C (Please state temperature or change text to specify any alternative parameters and/or operational set-ups e.g. ceramic filters rather than bag filters)	Abatement plant should be put into service as soon as possible, which includes ensuring reagents have added where required.
	The bag filters have been coated with a sufficient quantity of activated carbon. Introduction of activated carbon commences once the flue gas treatment plant temperature is > [100]°C (Please state temperature or change text to specify any alternative parameters and/or operational set-ups e.g. ceramic filters rather than bag filters)	As for lime above, plus to ensure any absorbed dioxins within the ducting that could be released during start-up on support fuel are abated.
	Other (Please complete or delete row as applicable)	(Please complete)
Waste feed begins when all* of the listed criteria have been met For the purposes of this table, "Waste feed begins" means that [crane is uninhibited][the feed chute damper has been opened, which will have been preceded by the crane feeding waste into the feed chute hopper][other relevant description depending on plant	All of the above criteria have been met	Abatement equipment and CEMS must remain fully operational when waste feed begins
	The temperature is above [850] °C (enter minimum temperature as stated in permit)	Waste can only be fed when the temperature in the combustion chamber is above [850]°C. The specified temperature ensures that a minimum of [850]°C will continue to be maintained when waste is first introduced but has not yet started to combust – see temperature profile (add reference).

	Criterion	Justification
type and operation] (Complete or delete as applicable)		

Table 3 - End of start-up

	Criterion	**Justification**	**Reference to emissions profile or other data**
Start-up finishes and normal operating conditions commence when all* of the listed criteria are true Once normal operating conditions have commenced, permit ELVs apply, often referred to as "CEMS reportable"	Waste feed is in operation	Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators	N/A
	Temperature is above [850]°C (enter minimum temperature as stated in permit, or higher temperature if necessary i.e. if a dip in temperature could be experienced when the waste damper (or equivalent) is opened)	Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators	N/A
	***Support burners have been switched off (Retain or delete as applicable)	*** Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators (Retain or delete as applicable)	N/A (Retain or delete as applicable)
	The 1-minute average oxygen value at the [boiler outlet/stack] (delete as applicable) has been consistently below x % [dry] for [30] minutes (defaults are dry oxygen and 30 minutes, but operator can justify alternatives if necessary)	• Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators • Chosen oxygen level has been set on the basis of (Provide further detail on why chosen level is appropriate)	
	**Steam flow is above [x] t/h (Complete or delete as applicable)		
	**[X] minutes have elapsed since waste feed commenced (Complete or delete as applicable)		
	**Steam flow as resulting from waste combustion > [110] % of steam flow resulting from burners (Complete or delete as applicable)		

	Criterion	Justification	Reference to emissions profile or other data
	**Bottom ash discharger in operation (Complete or delete as applicable)		
	**[Other] (Complete or delete as applicable)		

* "All of the listed criteria true" means that all the criteria are united by an "AND" function. If definitions need to additionally include one or more "OR" factors, these should be entered as a single row in the table and clearly indicated as such e.g.
Bottom ash discharger in operation
OR
Steam flow > 50 t/h

**Denotes secondary factor which should only be included if necessary and accompanied by appropriate justification.

***Depending on the design of the plant, some plants may be able to comfortably comply with ELVs at a point before the burners have been switched off i.e. burner status has no bearing on when start-up ends. If this is the case for your plant, this criterion should be deleted.

Shut-down

Shut-down is the period of time from the point at which when normal operating conditions cease (and ELVs no longer apply, also known as "CEMS not reportable") to the point at which all of the waste has burned out and the plant is considered to be "off". Table 4 below defines the criteria which must be met before the plant can be considered to be in shut-down, and Table 5 lists the criteria which must be met for the plant to be considered to be off.

Note that most incinerators and co-incinerators will also use support burners during shut-down to maintain the minimum required temperature while the waste is burning out, but shut-down definitions do not need to include having support burners in service as a specific criterion.

Table 4 - Beginning of shut-down

	Criterion	**Justification**	**Reference to emissions profile or other data**
Normal operating conditions cease and shut-down begins when all* of the listed criteria are true For the purposes of this table, "Waste feed has ceased" means that [the crane has been inhibited] [other relevant description depending on plant type and operation] (Complete or delete as applicable) Once normal operating conditions have ceased, permit ELVs no longer apply, often referred to as "CEMS not reportable"	Waste feed has ceased	• Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators	N/A
	***Following the cessation of waste feed, the first 1-minute average oxygen value at the [boiler outlet/stack] [delete as applicable] has been recorded above [x] % [dry] (default is dry oxygen, but operator can wet oxygen if necessary) **OR** (above is default approach, but operators can specify a longer duration if necessary – see guidance) ***Following the cessation of waste feed, the 1-minute average oxygen value at the [boiler outlet/stack]	• Standard requirement as per EA guidance on deriving start-up and shut-down definitions for waste incinerators and co-incinerators • Chosen oxygen level has been set on the basis of (Provide further detail on why chosen level is appropriate)	

	Criterion	Justification	Reference to emissions profile or other data
	(delete as applicable) has been consistently above x % [dry] for [10] minutes (default is dry oxygen, but operator can wet oxygen if necessary)		
	**Steam flow is below [x] t/h (Complete or delete as applicable)		
	**[X] minutes have elapsed since waste feed ceased (Complete or delete as applicable)		
	**[Other] (Complete or delete as applicable)		

* "All of the listed criteria true" means that all the criteria are united by an "AND" function. If definitions need to additionally include one or more "OR" factors, these should be entered as a single row in the table and clearly indicated as such e.g.
Bottom ash discharger in operation
OR
Steam flow > 50 t/h

**Denotes secondary factor which should only be included if necessary and accompanied by appropriate justification.

*** For plants that are able to comfortably continue complying with ELVs right up until the point that combustion of the waste has ceased (see guidance), there is the potential for this criterion to be replaced with the wording "Waste combustion has ceased [indicated by no more visible combustion taking place on the grate/hearth/in the kiln/within the bed]" However, it may still be preferable to retain the approach of defining an oxygen value in this scenario (provided the operator can demonstrate that waste combustion will always have ceased once that value is reached) as this will make it easier to automate the shut-down logic.

Table 5 - End of shut-down

	Criterion	**Justification**
Shut-down ends when all of the listed criteria are true	Waste combustion has ceased [indicated by no more visible combustion taking place on the grate/hearth/in the kiln/within the bed] and the auxiliary burners have been switched off	Waste must be burned out as far as possible, and a minimum temperature of [850°C] maintained in the combustion chamber while unburned waste remains.
	[Other] (Please complete or delete row as applicable)	(Please complete)

DCS and DAHS logic diagrams

[In addition to written SU & SD definitions entered into the relevant section of the OTNOC Management Plan template, operators should also provide logic diagrams for the distributed control system (DCS) and (if separately needed) data acquisition and handling systems (DAHS) which reflects those definitions. If the process is not (yet) fully automated within the DCS, logic diagrams should still be provided which show how the current start-up and shut-down definitions work.]

6. Abnormal operation and other OTNOC scenarios which could lead to elevated emissions

Notes for completion

- Please refer to the current version of the UK WI BATCs Interpretation Document for the definition of abnormal operation (AO), and any subsequent guidance produced by the Environment Agency.
- Other OTNOC scenarios which give rise to exceedances of TOC or CO emissions cannot be claimed as AO, but it is still important that they are minimised. They should therefore also be included within this list, but with an "N" entered in the AO column. This also applied to emergency release valve activations when ELVs do not apply, and scenarios which could give rise to an emergency (unplanned) shut-down.
- For new plants this should be complied on the basis of reasonably foreseeable events including consultation with the equipment suppliers and consideration of experience of operation of other similar plants where possible. The same principles apply to existing plants, along with experience of events which have occurred since the plant started operating.
- This is not intended to be an exhaustive list and should be treated as a live document which is regularly updated to include:
    - Any new events which occur that were not previously listed
    - Occurrence of an event which requires improvements to be implemented to prevent recurrence
- In the case of the two scenarios above, the list should be updated (and improvements implemented) as soon as possible. The list should also be reviewed at the frequency specified in the permit.
- The red text in the template table below is exemplar text which should be adapted to specific circumstances of your plant.

Table 6 - List of abnormal operation and related OTNOC scenarios (note that operators can present this in Excel format if preferred)

Date of last review:	DD/MM/YY
Next review due:	DD/MM/YY

ID #	Process area	Scenario	Consequences	AO?	Measures in place to minimise occurrence and consequences incl. design, redundancy and reference to preventative maintenance plan	Planned improvements (+ planned date/date completed)
1	*Abatement plant*	*Failure of lime feed screw motor*	*Loss of lime injection leading to elevated HCl and/or SO2 emissions*	*Y*	***Occurrence:*** *Regular maintenance of motor* ***Consequences:*** *Alarms and waste feed interlocks [add detail of how alarms and interlocks function]; reduce waste feed during AO* ***Redundancy:*** *Duty and standby arrangements; critical spares kept on site* ***PMP ref:*** *XX XX XX*	*N/A*
2	*Abatement plant*	*Blockage in PAC feed line*	*Loss of activated carbon feed leafing to elevated levels of pollutants*	*Y*	***Occurrence:*** *Quality control of PAC supplies; load cell on activated carbon silo* ***Consequences:*** *Alarms and waste feed interlocks [add detail of how these function]; reduce waste feed during AO* ***Redundancy:*** *Critical spares kept on site* ***PMP ref:*** *XX XX XX*	
Drafting note: Add additional lines for further relevant scenarios which could result in failure of lime or activated carbon injection such as blower motor failure, air compressor failures, power failure etc.						
3	*Abatement plant*	*Bag filter burst*	*Elevated particulate emissions*	*Y*	***Occurrence:*** *Regular replacement of filter bags according to manufacture specifications* ***Consequences:*** *Differential pressure monitoring allowing rapid detection of burst bag; alarms and waste feed interlocks [add detail of how these function]; ability to isolate individual bag filters to allow on-line replacement [add further detail as required e.g number of banks/compartments*	*N/A*

ID #	Process area	Scenario	Consequences	AO?	Measures in place to minimise occurrence and consequences incl. design, redundancy and reference to preventative maintenance plan	Planned improvements (+ planned date/date completed)
					which can be isolated before plant must be shut down] ***Redundancy:*** *Replacement bag filter elements kept on site* ***PMP ref:*** *XX XX XX*	
4	*Abatement plant*	*Urea feed pump failure*	*Elevated NOx emissions*	*Y*	***Occurrence:*** *Regular maintenance of pump according to manufacture specifications* ***Consequences:*** *Alarms and waste feed interlocks [add detail of how these function]; see also redundancy below* ***Redundancy:*** *Duty and standby pump* ***PMP ref:*** *XX XX XX*	*N/A*
5a	*CEMS*	*FTIR analyser failure [Drafting note: No standby CEMS fitted]*	*Loss of CEMS analyser data*	*(Y)*	***Occurrence:*** *Regular maintenance by monitoring contractors* ***Consequences:*** *Alarms and waste feed interlocks [add detail of how these function]; see also redundancy below* ***Redundancy:*** *No standby CEMS in place – consider addition in future* ***PMP ref:*** *XX XX XX*	*Standby CEMS to be installed by MM/YY*
5b	*CEMS*	*FTIR analyser failure [Drafting note: Standby CEMS fitted]*	*Loss of CEMS analyser data*	*(Y)*	***Occurrence:*** *Regular maintenance by monitoring contractors* ***Consequences:*** *Alarms and waste feed interlocks [add detail of how these function]; see also redundancy below* ***Redundancy:*** *Standby CEMS analyser is installed.* ***PMP ref:*** *XX XX XX*	*Standby CEMS to be installed by MM/YY*
Drafting note: Add additional lines for other analysers and data acquisition and handling system etc.						
6	*Waste composition*	*Hidden gas cylinder in the*	*Explosion of the gas cylinder leading to*	*N*	***Occurrence:*** *Waste inspection; crane operator training*	*Comms campaign with transfer stations about*

ID #	Process area	Scenario	Consequences	AO?	Measures in place to minimise occurrence and consequences incl. design, redundancy and reference to preventative maintenance plan	Planned improvements (+ planned date/date completed)
		waste which is fed to the furnace	*elevated CO and/or TOC levels*		***Consequences:*** *Air supply systems able to respond quickly* ***Redundancy:*** *N/A* ***PMP ref:*** *N/A*	*the importance of removing gas cylinders (to be completed by MM/YY)*
7	*Waste composition*	*Excessive quantity of PVC in the waste which is fed to the furnace*	*Elevated HCl and/or SO2 levels*	*N*	***Occurrence:*** *Waste inspection; crane operator training; waste acceptance and pre-acceptance checks* ***Consequences:*** *Lime feed systems able to respond quickly* ***Redundancy:*** *N/A* ***PMP ref:*** *N/A*	*Retraining of crane operators (Completed DD/MM/YY)*
8	*Emergency release valve (ERV)*	*ERV activation due to electrical safety trip*	*Elevated emissions of all pollutants*	*N*	**Occurrence:** *Proper selection, setting and maintenance of circuit protection devices* **Consequences:** *Procedures and staff training to ensure trips are swiftly investigated and power restored as quickly as possible where safe to do so* **Redundancy:** *N/A* **PMP ref:** *XX XX XX*	*Trip current to be reviewed and increased if possible within required safety margins to reduce accidental tripping (To be completed by DD/MM/YY)*
9	*ID fan*	*ID fan failure*	*Unplanned shut-down giving rise to elevated pollutant levels*	*N*	***Occurrence:*** *Regular maintenance of fan, motor and drive according to manufacture specifications, appropriate trip current selection* ***Consequences:*** *Procedures for quick restoration of power following accidental trip* ***Redundancy:*** *N/A* ***PMP ref:*** *XX XX XX*	*N/A*

7. Planned monitoring during OTNOC and results

Notes for completion

- For full guidance on completing monitoring of dioxin and furans during start-up and shut-down and a template for submitting the results, please see Environment Agency Guidance entitled "Environment Agency information note for operators of waste incinerators and co-incinerators on monitoring dioxins during start-up and shut-down" (01/11/24 or as subsequently updated).
- The red text in the template table below is exemplar text which should be adapted to specific circumstances of your plant.

Table 8 –Planned monitoring during OTNOC and results obtained

Planned activity	**Details and planned date**	**Monitoring successful?**	**Summary of results (including reason for failure to complete monitoring if applicable)**	**Commentary including any planned improvements or renewed attempts to monitor**
Dioxin mass emissions monitoring during shut-down on Line X	*Monitoring during planned shut-down prior to annual outage to begin as soon as waste feed is ceased; planned for DD/MM/YY*	*No*	*Late arrival of the monitoring contractors meant that it was not possible to carry out the monitoring before the end of shut-down; shut-down could not be delayed because of need to need to meet strict outage timetable*	*Will reattempt monitoring prior to next major outage on DD/MM/YY*
Dioxins mass emissions monitoring during start-up on Line X	*Monitoring planned during start-up following next annual outage to begin 30 minutes after auxiliary burners have been lit*	*Yes*	The dioxin mass emission during the test was x ng PCDDs/PCDFs I-TEQ per hour. This quantity represents approximately x % of the previous year's dioxin mass emissions from this line.	*For full details of monitoring and results carried out, see report entitled "Dioxin monitoring during start-up & shut-down report" [reference], [date]*

Planned activity	Details and planned date	Monitoring successful?	Summary of results (including reason for failure to complete monitoring if applicable)	Commentary including any planned improvements or renewed attempts to monitor
Dioxin mass emissions monitoring during shut-down (Line to be determined)	[Nominally 3 years since the last date of successful testing]			
Dioxins mass emissions monitoring during start-up (Line to be determined)	[Nominally 3 years since the last date of successful testing]			

Appendix 1 – BAT 5 and BAT 18 from 2019 Waste Incineration BAT Conclusions

BAT 5

BAT is to appropriately monitor channelled emissions to air from the incineration plant during OTNOC.

Description

The monitoring can be carried out by direct emission measurements (e.g. for the pollutants that are monitored continuously) or by monitoring of surrogate parameters if this proves to be of equivalent or better scientific quality than direct emission measurements. Emissions during start-up and shutdown while no waste is being incinerated, including emissions of PCDD/F, are estimated based on measurement campaigns, e.g. every three years, carried out during planned start-up/shutdown operations.

BAT 18

In order to reduce the frequency of the occurrence of OTNOC and to reduce emissions to air and, where relevant, to water from the incineration plant during OTNOC, BAT is to set up and implement a risk-based OTNOC management plan as part of the environmental management system (see BAT 1) that includes all of the following elements:

- identification of potential OTNOC (e.g. failure of equipment critical to the protection of the environment ('critical equipment')), of their root causes and of their potential consequences, and regular review and update of the list of identified OTNOC following the periodic assessment below;
- appropriate design of critical equipment (e.g. compartmentalisation of the bag filter, techniques to heat up the flue-gas and obviate the need to bypass the bag filter during start-up and shutdown, etc.);
- set-up and implementation of a preventive maintenance plan for critical equipment (see BAT 1(xii));
- monitoring and recording of emissions during OTNOC and associated circumstances (see BAT 5);
- periodic assessment of the emissions occurring during OTNOC (e.g. frequency of events, duration, amount of pollutants emitted) and implementation of corrective actions if necessary.

Appendix 2 – glossary of acronyms used in this guidance

Acronym	Meaning
AO	Abnormal operation (an allowance which allows certain ELVs to be exceeded for up to 4 hours duration at any one time)
BAT-AELs	Best available techniques (BAT) associated emission levels
CEMS	Continuous emissions monitoring systems
CO	Carbon Monoxide
DAHS	Data acquisition and handling systems
DCS	Distributed control system
ELVs	Emission limit values
ERV	Emergency release valve
HCL	Hydrogen Chloride
ID fan	Induced draft fan
MCR	Maximum continuous rating
NOC	Normal operating conditions
O_2	Oxygen
OTNOC	Other than normal operating conditions
OTNOC MP	Other than normal operating conditions management plan
SD	Shut-down
PAC	Powdered activated carbon
PCDDs/PCDFs	Dioxins and furans
SU	Start-up
T 2s temperature	The minimum temperature which must be maintained whilever waste is being burned (as specified by the permit – normally 850 °C)
TOC	Total organic carbon
UK WI BATCs ID	UK Waste Incineration BAT Conclusions Interpretation Document
WI BATCs	Waste Incineration BAT Conclusions