*This is the publically accessible procedure portion.*

## PURPOSE & SCOPE

|  |
| --- |
| Scope |
| *This procedure covers the evaluation, ongoing impacts assessment, notification and engagement in the event of a major, unplanned power loss at the facility resulting in the requirement that a significant number of standby diesel generators are required to run on the site.* ***This procedure is separate to any H&S related emergency operating procedures (EOP) and risk assessments.****The AQ procedure also contains useful* ***assessment tools should a planned maintenance event similarly require a significant number of standby diesel generators to operate****. Key information for the outage is provided at the beginning of the form to best enable coordination and assessment. It is possible that the protocol could be initiated by external bodies like the EA or local authority before the action plan itself has been enacted locally.*Edit above as necessary. |

## site information

|  |  |
| --- | --- |
|  |  |
| Permit Number |  |
| Address |  |
|  |  |
|  |  |
| Postcode |  |
| OS – grid coordinates |  |

## headline Scale of standby on site

|  |  |  |
| --- | --- | --- |
|  |  |  |
| MW Elec |  | MW elec |
| Permitted MW thermal |  | MWth |
| Site MVA |  | MVA |
| Installed number of standby engines |  | n |
| Resilience provision for the engines | 2n, n+1, 2n+1 per data hall or site wide. mixed |  |
| Site location | Urban, industrial or rural *{delete as required}*Single Site or Campus *{delete as required}* |  |
| Stack Arrangement (indicative or average height + characteristic) | *(<10m) Containerised, (<20m) data hall roof level, (>60m) elevated building block, mixed {delete as require}* | m |
| Primary Grid connection description | *Number of feeds and 132kV, 11kV, A&B* |  |
| Minimum distance to other large data centres or aggregated standby which could share the same Primary Grid connection. | *Site name & m* | m |
| Standby Cluster? – estimated number of any off-site standby engines within 500m radius that would likely operate in a national black-start scenario |  | n |
| Nearest sensitive/residential receptor |  | m |
| Local Authority AQ management Zone | *Yes / no / neighbouring* |  |

##

*This is the publically accessible procedure portion.*

## Hierarchy of engine numbers and associated Outage Durations of concern

*If this is a multi-site campus based data centre the following table can be sub-divided or repeated separately for each as appropriate*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Realistic Outage Scenarios based on a review of the way the site could reasonably be expected to react to a range of modes of power loss – delete/add as appropriate | MWelec (number of gens) | Run duration (hours) | Outage duration to notify as soon as possible the EA and/or local authority if event is likely to exceed1 |
| 1 (required) | Worst case, realistic whole site loss of power *e.g.* *Maximum number of engines and/or load operating for SHORT period where concern could start*. AEGL risk |  |  | <n> hours |
| 2 | Reasonable next subdivision of site plant or specific site buildings *i.e. accounting for various HV circuits A & B and/or worst case single data hall – NB this accounts for elective standby to support maintenance activities.* |  |  | *<n> hours, is this a Post-event reporting only?* |
| 3 | Worst case partial site number of generators *e.g. this might be a minimum number of engines and/or load operating for a reasonable LONG period where concern could start.* |  | >18 |  |
| 4 | Specific data hall(S) locations: *Minimum part load or number of generators for named part of site due to proximity of receptors* | name | >18 | *<n> hours, Post-event reporting only* |
| 5(required) | Indicative maximum number of engines below which there is minimal outage impact for the local Air Quality *i.e. ambient NOx 200ug/m3 is not exceeded at all* |  | *unlimited* | *<n> hours, Post-event reporting only* |
| 6 | Other site specific representative outage  |  |  |  |
| Note1 The usual permit condition is to notify the EA within 24 hours of “Number of generators operating initially and the number then operating two hours after the outage“ started. The duration in this column is the pre-agreed predicted duration and scale of an ongoing outage notified as soon as possible i.e. when ‘within 24 hours’ really means as soon as practical. The significant majority of outages will be small scale or short duration brown-outs, these need only be post-event reported to the local EA officer alone.  |

## Extracts and review of Air Quality model for NO2

|  |  |
| --- | --- |
| Criteria | Predicted Environmental Concentration NO2 |
| A | Conservative peak NO2 under worst scenario {ambient AQ or AEGL} |  | ug/m3 |
| B | Indicative or likely typical during prolonged outage |  | ug/m3 |
| C | Guidance distance that could be affected (radius) for the above figures |  | m |
|  | Headline realistic figures (for A max above) |
| D | Site load on full outage  |  | MWelec |
| E | Fuel rate per hour (for A max above) |  | t/hr |
| F | Average NOx emission rate per generator |  | kg/hr |
| G | Total NOx emission rate on full site outage (for A max above) |  | kg/hr |
|  | Key Risk Factors identified |
|  | Times of day |  |  |
|  | Seasonal |  |
|  | Area prone to poor QA alerts | Yes / no |
| Comments:- |

*This is the publically accessible procedure portion.*

## RESPONSIBILITIES

|  |  |  |
| --- | --- | --- |
| Name | Company | Description |
|  |  |  |
|  |  |  |

## RELATED DOCUMENTATION

|  |  |  |
| --- | --- | --- |
| Document | Title  | Notes |
|  | Notification template as part of permit ref | Readings to be taken and sent to the Environment Agency |
|  | AQ model report supplied for permit determination | version |
|  | Pre-prepared Public engagement materials & leaflet | File location:- |
|  | Other |  |
|  |  |  |

## PROCEDURES

### The following steps are to be followed in the event of a power failure either on-site locally or UK Power networks.

|  |
| --- |
| Actions |
| Process flow chart or diagram:*Edit and amend the indicative steps as appropriate*1. Has an external body advised you of complaints or concerns – use their informaton as appropriate? i.e. feedback that a cluster is operating in a black start scenario
2. Start the incident diary – note start time of outage
3. Determine likely duration of outage initially (check with UK Power Networks/DNO, normal repair times for works internally and externally, how critical is the fault)
4. What fraction of the site standby (table 1-4 Hierarchy of engine numbers and Outage Durations of concern) is operating on load?
5. Assess Wind direction and weather forecast (see 1-12 AQ Wind-rose)
6. Assess how geographically extensive the outage is – **other standby operating in the area. Are you in a cluster – by notifying the EA early they may be aware soonest of others in a similar outage situation and provide feed back.**
7. Assess any exacerbating factors particually prior weather and poor AQ warnings
8. Determine where and when there could be an issue for AQ and at hence which locations
	1. Are you concerned for a prolonged outage which is likely to exceed ambient NO2 200ug/m3 for each hour (>18 hours)
	2. Are you concerned AEGL level 1 (NO2 940 ug/m3) might be realised at a specific sensitive receptor
	3. Chronic or Acute risk?
9. Refer to sensitive receptor list based on the specific circumstances (table 1-11 Receptor list – not in priorty order – visit according to risk review)
10. Modify your assessment of **outage hours** to consider realistic **exposure hours** for the receptors using 1-5 AQ modelled NOx Indicative figures)
	1. Are receptors exposed indoors for part or all of the outage
	2. Outdoors and/or very sensitive
	3. Will receptors be mobile and change during the event (diurnal cycle of work, travel, home etc)
11. Report your outage if the required hours (Outage Impacts Risk Assessment to EA based on hours in (table 1-4 ) are met **initially to the the EA National Customer Help Line** first and then ideally the permitting officer too.
	1. Provide the EA helpline and email address (Incident\_Communication\_Service@environment-agency.gov.uk) with assocoiated details permit number, location, your risks – importantly – script to email is at 1-14 Reporting Format for EA, local authority etc (script)
		1. In summary *"This is a self-reported potentially polluting event to air quality caused by an EA permitted installation. We are a large Data centre needing to run a significant number of standby diesel engines that may lead to ambient air quality breaches. We have initiated the agreed air quality action plan”*
		2. *Ask for a reference and provided updates to this*
		3. *Confirm that the outage has ceased*
	2. Depending on your AQMP notification, the EA may declare the outage an Incident requiring attendance at the site by EA staff too.
12. Also report to Local Authority your Outage Impacts Risk Assessment in similar fashion
	1. Depending on your AQMP notification, the local authority may declare the outage an Incident requiring an attendance at the site
13. Plan when to visit the receptors to assess if fume and engine gases are detectable (see table 1-10 Receptor plan and Surveillance route)
14. Agree the frequency you plan to re-visit receptors to assess the Air Quality
15. Are there any local real-time AQ monitoring readings (see1-9 nearest ambient air quality monitoring station)
16. If assessed as applicable In conjunction with the Environment Agency and Local Authority decided if the event is so extreme that the emergency services should also be informed.
17. In conjunction with the Environment Agency and Local Authority provide advice directly to receptors to reduce their exposure
	1. Distribute flyer of company details and contact numbers
	2. Move and/or stay indoors
	3. Close windows
	4. Lower physical exertions
18. Update on changing circumstances (receptor risk – school closed anyway, traffic significantly reduced than normal)
19. If in doubt conduct a surveillance circuit
20. Don’t forget to report the outage to the local officer if it is only a ‘post-event’ level of outage.
 |

## nearest ambient air quality monitoring stationS

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| *1* | *We have/don’t have your own on-site ambient AQ monitoring system* |  |  |
|  |  |  |  |

Access to current readings at: <https://uk-air.defra.gov.uk/latest/currentlevels?view=site>

*This is the publically accessible procedure part.*

## Receptor plan and Surveillance route

|  |
| --- |
| AQ receptor plan and marked surveillance circuit |
| Site layout with key receptors marked |

*This is the publically accessible procedure part.*

## Receptor list

| Location ref | Type of receptor | Postcode |
| --- | --- | --- |
| 1 | **school** |  |
|  |  |  |
|  |  |  |
|  |  |  |
| The list is not to identify or assess individuals or organisations – it is only a generic profile for the locale. Are there any receptors who need to be expressly visited directly (see 1-16 Specific private contacts (GDPR Considerations) | Y/N |

## Wind-rose

|  |
| --- |
| Preferred Weather source |
| https://www.bbc.co.uk/weather/2643743 |
| Wind rose for the site (from AQ model) |
|  |

*This is the publically accessible procedure part.*

## PUBLIC ACCESS contacts

| Index | Operator Contact |
| --- | --- |
| 1 | **Corporate contact and call centre** |  | External number |
|  |  |  | email |
| 2 | **Other** |  |  |
|  |  |  |  |
|  | External Contacts |
|  | **Local Council** |  |   |
|  | **Environment Agency incident hotline** | 0800 80 70 60 | phone |
|  |  | Incident\_Communication\_Service@environment-agency.gov.uk | email |
|  | **Local Emergency services** |  | Non-999 contact number |
|  |  |  |  |
| List of public receptors who need to be contacted directly is held separately under GDPR |

## Reporting Format for EA, local authority etc (script)

|  |
| --- |
| Script for ‘Data Centre Service Desk’ to Environment Agency ‘Customer Hotline’ Incident Communication Service <Incident\_Communication\_Service@environment-agency.gov.uk> |
|  |

## DOCUMENT INFORMATION

|  |  |
| --- | --- |
| **EOP/SOP Ref** | **Procedure Name** |
|  |  |
| **System / Equipment:** | **Location / Area** | **Rev** | **Status** | **Next review date** |
|  |  |  |  |  |

## CHANGE HISTORY

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **DATE** | **DESCRIPTION OF CHANGES** | **SECTIONS / PAGES UPDATED** | **AUTHOR** | **REVIEWED BY**  | **DATE** |
|  |  |  |  |  |  |

*This is the GPRS, private procedure part.*

## Specific private contacts (GDPR Considerations)

| Index | Operator Contact |
| --- | --- |
| 1 | **Site contact – Duty Manager** |  | Direct dial number  |
|  |  |  |  |
|  | **Consultancy and technical support** |  |  |
|  |  |  |  |
|  | External Contacts |
|  | **Local Council** |  | *Name* |
|  |  |  | *Phone*  |
|  | **Environnemental regulator** **(Environment Agency)** |  | *Name* |
|  |  |  | *Phone*  |
|  |  |  | *Email* |
|  | Private Sensitive receptors to be directly contact as determined and agreed in advance |
| List of public receptors who need to be contacted directly is below or held separately under GDPR if necessary |

Use this separate annex to retain private contacts that should **not** be provided for public access in the event of a prolonged outage.

*This is the publically accessible procedure portion.*

## Fill In guide

## PURPOSE & SCOPE

*Edit the text in this section to expand on or explain how the procedure is being used locally*

*It is envisaged that the production of the AQMP would be best done as part of any new permit application during detailed AQ modelling.*

**HEADLINE SCALE OF STANDBY ON SITE**

*This key information summarises the site. It starts the form to enable clustering and scale of multiple data centres at an early stage. Resilience is important to indicate clarify that all plant wouldn’t be required to meet site loads.*

*Campus sites – ones where multiple buildings are incorporated on to the same EA permit. Indicate how each of the site campuses is named and ensure the site plan includes them.*

*Campus sites will best be sub-divided into separate 1.4 and 1.5 tables (or clearly headed sections) for each. Initially it is suggested that the table indicates how each campus within the group will be affected. Ideally AQ actions and surveillance under table 1.8 to 1.11 inclusive can be common to all but if appropriate have separate routes etc as necessary.*

**Hierarchy of engine numbers and associated Outage Durations of concern**

*Realistic Outage Scenarios based on a review of the way the site could reasonably be expected to react to a range of modes of power loss – edit the table as appropriate.*

*If this is a multi-site campus based data centre the following table can be sub-divided or repeated separately for each as appropriate.*

*The site may be able to bus couple between HV connections, or internally switch engines manually onto alternative circuits or stay-on load due to customer during ‘heightened awareness’ risk status which will affect the ability to manage the risk/load/run durations. The following are guidance scenarios edit accordingly. Line A should be the headline minimum load/duration event that triggers the AQMP and notifications: Outage Durations of concern – enter the approximate run time after which receptors downwind, or building downwash, theoretically could start to significantly exceed the AQS of NO2 200ug/m3 somewhere during the outage These hours are also the levels before which notifications are provided to EA or local authority – if you know the outage will exceed these hours notifications should be made soonest.*

*Important outcome is at least 2 rows one to indicate the scale of outage where no immediate reporting to the EA is required relying only on post event reporting as per permit Schedule 5 – Notification; and one for the worst case, realistic whole site loss of power. In essence row #1 is the pre-agreed ‘need to know’ duration of outage and #5 is the’ outage of no concern.*

## RELATED DOCUMENTATION

*It is not envisaged that the local community needs to receive any direct contact in deriving the AQMP. Public engagement materials need only be produced ready for a prolonged outage resulting in risk of poor AQ. It is just providing explanation, advice, contacts etc ready. Only in exceptional circumstances should it be necessary to identified sensitive receptors and advise they are listed in 1-16 and to be contacted directly*

## PROCEDURES

*Edit and amend the indicative steps as appropriate*

## Receptor plan and Surveillance

*It would not be unreasonable to try-out the route during a routine planned whole-site black building test to gain a sense of the background AQ etc.*

*In the urban setting exhaust fumes will be very close and around the locale regardless of wind direction due to wind shear effects around tall buildings. Ensure the route considers very local receptors and those downwind at the time too.*

## Receptor list

*Indicate if these are in order of a route, or on a priority basis. Remember the receptors can change – this list should be reviewed regularly. IT IS NOT ENVISAGED THAT RECEPTORS NEED TO BE IDENTIFIED OTHER THAN BY GENERIC LOCALE. RECEPTORS DO NOT NEED TO BE PRE-WARNED OR DETAILS ACTIVILY SORT IN ADVANCE OF DEVELOPING THIS AQMP. ONLY IN EXCEPTIONAL CIRCUMSTANCES DO PRIVATE SENSITIVE RECEPTORS NEED TO BE LOGGED AND CONTACTED {SUCH MAY ALREADY BE THOSE WHO ARE ADVISED OF TESTING DUE TO NOISE OR FUMES ETC}*

## nearest ambient air quality monitoring stationS

*Indicate is the station falls within the likely zone of ambient emissions. Also indicate if the site has installed its own continuous monitoring station(s). Can mobile monitoring stations be provided at short notice.*

## Specific private contacts (GDPR Considerations)

*Use this separate annex to retain private contacts that should not be provided for public access in the event of a prolonged outage.*