Schedule 5 Request for Further Information

Question 1 (b) An Operating technique / management system document which provides a comprehensive summary describing how and when contingency or back up systems would need to be implemented, what these systems comprise and how they are managed during start-up, operations (including standby – if on 'warm standby' please confirm) and shut down. *Have regard for the considerations of point 5 when providing this summary.*

Abatement Systems in place:

This is detailed in the Odour Management Plan (OMP) for the site, which is kept updated at least annually.

Abatement System	Odour Input (Normal Operation)	Contingency
Biofilter 1	PAP Tipping PAP Process Building PAP Mill Ruminant blood tankers *+ Trailer Shed (proposed)*	Bio filter ducting linked so that each one can be isolated or shared depending on the requirements (e.g. when changing media)
Bio filter 2	Offal Tipping Offal Process Building (including Low Temp Oil Line) Feather Tipping Feather Process Building* Avian Blood tankers	
Bio filter 3	Offal Mill *+ New tipping building (proposed)*	
New gas fuelled oxidiser (replacing 2 existing units)	Process fume and foul air from offal, feather and PAP process buildings. *Feather process room air as combustion air	Air cooled condenser and boiler for combustion of non-condensable gases on standby.

Abatement System	Odour Input (Normal Operation)	Contingency
		One condenser unit is kept on 'warm' standby and one is manually operated. One steam boiler will be on 'warm' standby.
New Multi fuel Oxidiser	*Process fume and foul air from offal, feather and PAP process buildings.* *Some room air as combustion air*	*New gas fuelled oxidiser + air cooled condenser and/or boilers if required.* *Oxidiser will be 'off' when not required.* *One Boiler and condenser will be on 'warm' standby with additional support if required and to allow for the oxidiser to run up to temperature.*
Air cooled condenser (2 units – increasing to 3 for future use)	Process fume and foul air from offal, feather and PAP process buildings	One condenser unit is on 'warm' standby and will operate automatically as it is linked to oxidiser operation. One unit needs to be operated manually. Future plans – 3 linked condenser units with automated controls (details in forthcoming variation)
Steam Raising Boiler (currently 1 – increasing to 2)	Non-condensable gases from the air-cooled condenser (when thermal oxidiser(s) not available)	One steam boiler running on automatic so it is available to run quickly up to temperature when required for back up duty if the oxidiser is not available.
Waste Heat Evaporator (WHE)	Feather Press Feather Drier	If the WHE is unavailable, fume is automatically directed to the thermal oxidiser.

Under 'Normal' Processing Conditions

The amount of raw material processed is kept within the validation parameters set by Animal Health, to ensure the time/temperature requirements for processing are met. The parameters are recorded in graphical format on the SCADA system and retained for inspection. Plant operators monitor feed rates and temperature on the SCADA screen during processing to ensure production is kept within the required parameters.

Increases in raw material for processing are dealt with by increasing hours of production rather than increasing the rate of processing.

Steam requirements for processing are also limiting factors – the cookers will stop discharging when the temperature drops. Steam is primarily supplied by the thermal oxidisers, with the stand-alone steam raising boiler as support. To ensure continued operation free of steam supply issues, a second steam raising boiler is to be commissioned (2021/2022).

The cookers require the presence of a minimum suction pressure to be able to operate. This negative pressure ensures that there is always enough capability for the oxidiser to "pull" the process fumes away from the cookers for abatement. The suction pressure is measured in the process fume collector vessel of the oxidiser.
Each oxidiser has a main process fan that takes fume from the collector vessel and sends it to the oxidiser. The suction pressure in the collector vessel is primarily maintained by these oxidiser fans running on speed control. If cooker throughput increases more fume will be produced, this will reduce the suction pressure, the fans are designed to speed up to compensate by increasing the suction pressure. Once the oxidiser fans reach their maximum speed or capability the operators cannot increase the cooker throughput any further. To do so would mean that the suction pressure could not be maintained in the collector vessel and the authorisation signal from the oxidisers would be lost. In this way it is simply not technically possible for the processors to be fed material at a rate more than the assumed oxidiser capability.

The cookers require the presence of an authorisation signal from the oxidiser(s) to be able to run. This authorisation signal has to be "positively generated" from the oxidiser control panel and will not be present if the oxidisers go into alarm or if there is a general failure such as control panel or electrical failure. If the authorisation signal is not present, then the steam feed to the cookers will be shut down. Thus, there is no heating medium fed to the cookers in the event of primary abatement failure.

Similarly, if the set point temperature in an oxidiser is not maintained then the oxidiser goes into the alarm state and an audible alarm sounds. The alarm also relays to the control panels in the control rooms. Under these circumstances, the cookers would be shut down. The alarm state also shuts down the dampers to stop the flow of process fume.

In the event of oxidiser failure, the steam raising boiler and air-cooled condenser(s) operate as a back-up system, but the capacity for abatement is much reduced. The overloading of this capacity is avoided due to the fact that the steam requirements for processing cannot be physically achieved and the cookers will not operate unless they are at the set temperatures. This back up system will be upgraded by increasing the condenser and steam capacity (details in forthcoming variation).

Operation of Air Cooled Condensers:

During normal operation process fume and foul air sources are drawn into the effluent collector vessel and treated by thermal oxidiser(s). The small condenser (A) remains on auto standby, available to run on failure of one (or both) oxidiser(s).

The condensers are part of the back up abatement system designed to take air from the effluent collector when the thermal oxidisers are not available. In addition to this the small condenser will be run at start up, when the offal cooker(s) are being warmed up, to contain residual odours from the system as it gets warmer. It can also come on line when there are variations on the amount of process fume (effluent) being released from the cooking process. – this is a normal effect from processing raw material that varies in moisture content. This has the effect of 'smoothing' the treatment of odour through the system instead of allowing the effluent collection fan to stop and start causing variations in processing temperatures. When the pressure (mbar) increases above a pre-set level in the effluent collector, a message is sent to Condenser A and a damper opens to allow fume to be passed to it from the offal ducting. When the pressure changes back the operation is reversed.

With the large condenser (B) the operation is manual when the operator observes the mbar signal in relation to fume from the MBM (PAP) cooker. This material is drier than the poultry offal, therefore the most common scenario would be manual operation on start up (if required) or when the back up abatement is required (failure scenario).

The effluent circulates within the condensers as a sealed system, no effluent air is released to atmosphere from this process. Pressure relief on the whole system is provided by steam release valves.

When one or both of the oxidisers are running (support scenario) the non-condensable gases are combusted in the oxidiser chamber, in the case of both oxidisers failing (back up scenario) they are combusted in the steam raising boiler.

With the installation of the Multi Fuel Oxidiser (MFO) the system of collecting process fume by means of a collector vessel and keeping the system under suction pressure will remain the same. New collector vessels are being installed. The minimum temperature will also be set the same and the emergency shut down will reflect the same conditions – so that processing will stop if abatement is not available. The multifuel oxidiser will also supply steam. When steam is not required for production it will be used to generate electricity for the site by means of a simple steam turbine, although this will be developed later in the project. The increased volume of air required for combustion air can be taken from foul air sources and processing room air, to decrease the amount going to the bio filters and ensure all foul air sources are adequately abated.

As is the case now, the amount of processing that could be supported by secondary abatement is dictated by available steam supply and will be reduced accordingly. The arrangement of collector vessels to bring the air in from the different processing areas allows for diversion to the standby configuration.
With the new gas oxidiser, the method of operation is exactly the same as the existing units.

Process Controls Under Different Scenarios

Starting Up:

The opening of the damper when the oxidiser chamber is at the correct temperature is automatic therefore the cooking process will not send fume to the oxidiser before the combustion chamber temperature is sufficiently high enough. There is communication between production operators and RTO operators in the boiler house to ensure that production only starts when everything is ready. These procedures are documented.

The plant operator will check with the RTO operator that production is OK to start – the start up sheet is used to record that it is OK to start feeding the cookers (damper open).

Stopping / Slowing production at the signal of the oxidiser :

On loss of suction pressure, the signal to the cookers is automatic and this will stop the raw material feed and the steam. Then the operator has to check with the boiler room to see if this is a short or a longer term delay. As soon as pressure is restored the operator can run the plant again. There is no alarm as this is not a failure. Although the pressure has dropped, the fan is still running and the combustion temperature is maintained – it just stops any more fume being produced (by stopping the raw material feed and steam) and collected (no suction pressure). The operator cannot override it, but the air cooled condensers can be brought on line to assist with processing the fume (this is detailed in the OMP).

There is still verbal communication between the plant operator and the RTO operator to check on the status of the oxidiser and steam feed. The plant operator can view the conditions on the oxidiser and boiler from their SCADA unit.

Sudden Stoppage/ Fault Mode:

In the case of oxidiser failure (electrical or fault status such as low water or a power failure) there is a visual alarm notification on the plant operator screen. The raw material feed and steam will also be shut down automatically.
There is also an audible alarm in the boiler house so that engineers know their attendance is required. The effluent damper will automatically close (below 850^0C).

Alarms relating to the oxidiser function:

- Suction pressure loss, no alarm as it is not a fault
- Temp failure (below 850^0C) – audible alarm in RTO building. Dampers automatically close.
- Electrical failure – audible alarm in RTO building. There is also a visual alarm message on the operator screen in the offal plant. Dampers automatically close.
- Boiler and RTO - audible alarms for high or low water in RTO building. Automatic shutdown initiated.

Shutting Down:
Following the order on the shutdown check sheet – each stage is completed, paying particular attention to the following:

- Inform the RTO/Boiler operative of the lines to be shut down. This ensures that steam requirements are managed and excessive steam venting can be prevented.

- Note which parts of the abatement equipment are running, this is to show whether duty or standby abatement was in operation.
- Note the reason for shut down. This procedure is to be used at all times, whether for a pause to wait for raw material, a breakdown or a full shutdown at the end of the week.
- Record the times of the last downstream activity being shut down (i.e. empty the press or shut down the WHE) and the time the oxidiser is shut down.
- Where standby abatement is in use, the boiler replaces the oxidiser and this shut down must be recorded.
- Alert Production Manager if any problems occur to prevent a complete shutdown procedure.

If there is an abatement failure or an issue with the shutdown sequences, checks are done for off-site impact, following the instructions in the procedure for Notification of an Environmental Incident / Near Miss EID04.

The procedures are being updated for Operator use and once the MFO is running the start up and shut down scenarios will be reduced (due to the requirement for continuous operation).

Automatic Monitoring:

Oxidisers

Continuous monitoring includes –

- Combustion Chamber Temperature (°C). The temperature is monitored at a number of locations along the length of the oxidiser to give an indication of the temperature profile. Fuel feed to maintain combustion and odour destruction is PLC controlled to maintain the minimum temperature at the outlet of the oxidiser chamber immediately prior to entry to the waste heat boiler.
- Fan Speed (Hz)
- Vacuum (suction) Pressure (mbar).

The key parameter for odour abatement is combustion temperature and this is downloaded daily for review.

- Emissions (MFO only)

Related SOPs and Site Procedures

- P-SOP-105 Shut Down and Pre-start Check Sheet
- P-SOP-112 Oxidiser Start Up
- P-SOP-130 Oxidiser Shutdown
- EID 04 Notification of Environmental Emergency, Incident or Near Miss
- EID02 Failure of Key Plant

NOTE

All existing procedures are to be reviewed and updated on completion of commissioning of the new units to ensure any differences in control panels, set up, shut down sequences or similar are incorporated. The basic principles of operation are the same. The biomass oxidiser (MFO) will also have instructions for operation of the kiln, including loading the fuel, and managing the emissions monitoring equipment.