

**NEWBRIDGE ENERGY RESPONSE TO NRW – Regulation 36 notice dated 23 12 21**  
**Due date 27 01 21**

Number	NRW request	Newbridge Energy original response	Newbridge Energy 2022 response	Appendix
1	a) During normal operating conditions exhaust gases from the combustion unit shall be abated via the installed fabric filter (bag house) to comply with the Emission Limit Value of 50mg/Nm <sup>3</sup> . (Your response should include, but not be limited to, an explanation of the linkages between the CHP unit and abatement. Confirm how abatement of gases is ensured and any circumstances where they are not. Provide evidence to support this response)	<p>The NB.1 boiler was shut down (controlled) on Sunday 26<sup>th</sup> September 2021 at 0600 hours.</p> <p>This shutdown was to allow for routine planned maintenance and further investigation as to the cause of the heat-exchanger issue that resulted in the bypassing of the bag-filter on the morning of the 15<sup>th</sup> September.</p> <p>Components attended to during the shutdown included the main boiler chamber, heat exchanger array, soot-blowers, particulate cyclone and bag filter.</p> <p>During the works it was found that two of the four soot blowers had suffered accelerated corrosion and had subsequently become ineffective in mitigating particulate build-up within the heat exchanger. Following consultation with Uniconfort it was confirmed that the boiler could be recommissioned with only two of the four soot blowers operational. The two replacement soot blowers are currently being manufactured and will be installed within the next 4 weeks.</p> <p>A further controlled shutdown will be required to facilitate this and NRW will be provided with advance notice accordingly. Uniconfort have confirmed that the operation of the boiler will not be compromised during this period of operation. However, operators are alert to this matter and close monitoring of boiler KPI's will persist.</p> <p>The NB.1 boiler was recommissioned on Monday 4<sup>th</sup> October 2021 at 1600 hours and in accordance with the appropriate SOP.</p> <p>During the period of maintenance, the daily, weekly and monthly PPM's were reviewed and updated accordingly in regards to both the boiler and bag filter.</p> <p>The maintenance team are checking the seals on the bag filter units daily, in order to ensure that there is no risk of moisture ingress which could result in a reduction in efficiency. Routine cleaning of the bag filters is in place to ensure their efficiency is maintained.</p> <p>The SCADA Operators are monitoring the differential pressure across the heat exchanger every hour. Both boiler and bag filter performance continues to be routinely monitored and refresher training has been provided to the Operators.</p>	<p>The Uniconfort boiler is a large combustion chamber linked to the abatement system by ducting. It is a single enclosed unit.</p> <p>The abatement of combustion gases is ensured by the directing of those gases to a fabric bag filter, through which all gases must pass before exiting the plant by means of the stack. Prior to entering the bag filter combustion gases are recirculated within the boiler combustion chamber in order to control NOX emissions.</p> <p>Management of the boiler is by means of the manufacturer supplied SCADA management system. The SCADA management system interface is within the site control room where a number of 'live' screens provide real-time information as to the boiler and abatement system operational status.</p> <p>The particulates are removed by means of a two-stage process. Initially a cyclone removes 'heavier' ash particulates, following which the gases pass through the bag filter unit (570 individual fabric bags) in order to remove further particulates.</p> <p>The circumstances where abatement of gasses may not occur and be fully controlled are as follows -</p> <ul style="list-style-type: none"> <li>• Bypass of bag filter</li> <li>• Emergency steam blow</li> <li>• Failure of cyclone</li> <li>• Failure of components of the bag filter</li> <li>• Loss of dosing (the exhaust gasses are dosed with powdered lime. This is injected into the system at pre-bag filter stage. This is injected to neutralise the acidic residue attacking the system)</li> </ul> <p>Please refer to appendix Nn, a process schematic. This schematic is screen shot from the NB1 SCADA operating system and the Process Operators use this in their day-to-day activities.</p> <p>In a potential emergency, before there was any cessation of abatement, there would most likely be reasonable time for the SCADA and site management to stop or limit any effects in a safe manner.</p>	li Jj Mm Nn
2	b) The fabric filter shall be maintained in good operating condition. (Your response should include, but not be limited to, the fabric filter maintenance regime- Planned Preventative Maintenance (PPM) schedule in accordance with manufacturers recommendations)	<p>An automated alarm is scheduled to be incorporated within the process SCADA system. This will alert the control room staff to an exceedance of the maximum permitted pressure differential. This is under discussion with Uniconfort.</p>	<p>In accordance with the manufacturer's recommendations and good operational practice a comprehensive suite of planned preventative maintenance measures has been implemented.</p>	Aa Bb Cc Dd Ee

		<p>In addition, Element (Source Emissions Testing) have been booked for 25 10 21 (earliest date available) to complete the MCERTS stack testing on the NB1 boiler following the maintenance works.</p> <p>No appendices were referenced in the original response, just the description above</p>	<p>During normal operation of the combustion plant routine checks are undertaken to assess the condition of the bag filter, these comprise of:</p> <ul style="list-style-type: none"> <li>• Twice daily checks as part of the Boiler Room PPM.</li> <li>• Fortnightly and monthly checks as per the NB1 Bag Filter PPM.</li> <li>• SCADA activated and controlled automated bag cleaning every 30 minutes via a pulse of compressed air. For a duration of 1 minute every 30 minutes.</li> <li>• Performance of the boiler including the bag filter is continuously monitored via the SCADA system by the control room operator</li> <li>• Whilst our own engineers are trained and look after the boiler, we have a support contract with the equipment manufacture Uniconfort. Please see appendix Pp</li> </ul> <p>The PPM is constantly evolving based on operating and maintenance experience. The PPM schedule is subject to constant review by the Engineering team.</p> <p>The full extent of the checks is contained in the appendices Gg &amp; Hh.</p> <p>During shutdown the following tasks were completed:</p> <ul style="list-style-type: none"> <li>• Heat exchanger system cooled, opened and cleaned – exposing the filters for visual inspection.</li> <li>• Replacement of dirty or worn filter assemblies with new or cleaned filters.</li> <li>• Inspection of cyclone and repairs / replacement as necessary.</li> <li>• Thorough inspection and routine cleaning by maintenance staff.</li> <li>• MCERTS stack testing – results have been shared with NRW.</li> <li>• Soot blower inspection and replacement as required.</li> <li>• Cyclone parts changed out as required.</li> <li>• Pressure sensors checked for functionality.</li> <li>• Lime dosing system inspected and maintained.</li> <li>• Ducting integrity inspection. Repairs to the ducting as part of the cyclone works (in between the heat exchanger and the cyclone).</li> <li>• Replacement of blinded bag filters.</li> </ul>	<p>Ff Gg Hh Pp</p>
3	<p>c) The performance of the fabric filter shall be monitored during plant operation using suitable process monitoring techniques (including but not limited to filter differential pressure) and reviewed at least hourly by a suitably competent process operator. Where process monitoring data indicates a deterioration in filter performance that may lead to, or is likely to be causing an emission limit value exceedance, then an investigation shall be carried out immediately by suitably competent personnel and remedial measures taken to prevent and where that is not possible, minimise an emission limit breach. (Your response should include, but not be limited to, more detail regarding how abatement is monitored, who carries out the monitoring, staff training, what parameters staff monitor, operating procedures, what actions staff take in the event of an alarm/ malfunction, incident investigation procedure)</p>		<p>Under normal operation the boiler is monitored and controlled by means of the automated SCADA system and monitored by suitably trained staff involved with process control and maintenance. This includes both control room staff and maintenance engineers.</p>	<p>Hh Ii Jj Kk Ll Oo</p>

			<p>Fully automated SCADA controlled automated bag filter cleaning takes place every 30 minutes via a pulse of compressed air. For a duration of 1 minute every 30 minutes (appendix Jj).</p> <p>SCADA monitoring is continuous. In addition, the Shift Supervisor monitors and document key parameters every hour, please see appendix Hh. For example, specific temperatures, power outputs, chamber pressure of the cyclone, oxygen levels, water and oil temperatures. Such readings are logged every hour by the Shift Supervisor. The team are in the process of developing a more detailed control room log for the staff to record their readings.</p> <p>Staff familiarisation with the abatement system and its purpose is delivered by a method of on-the-job training. Further training is provided by Uniconfort the equipment provider.</p> <p>Shift Supervisors complete a shift log document (appendix Hh)</p> <p>The plant is operated in accordance with the Uniconfort O&amp;M manual as submitted in the previous response to NRW.</p> <p>Evidence of staff training is provided in the appendices Kk and Ll.</p> <p>The Shift Supervisors follow the O&amp;M manual requirements in the event of an alarm and / or malfunction. Maintenance staff are on site 24/7 in order to support and provide an immediate response. Advice and support are provided by Uniconfort and they have a remote interface to the plant with 24 / 7 support.</p> <p>In order to mitigate any adverse effects, the Shift Supervisors intervene and notify a manager who would make a decision to implement a controlled shut down. To assist in this process SOP 013, on the shutdown procedure, would be implemented to ensure that the plant was left in a safe condition.</p> <p>In response to recent events Newbridge Energy Ltd., has developed a specific Incident Investigation Procedure, this is included in our submission at appendix Mm.</p>	
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Appendix list

Aa	PPM NB1 Boiler Room Day shift
Bb	PPM NB1 Boiler Room Night shift
Cc	PPM NB1 Boiler – Bag Filter weekly Day Shift
Dd	PPM NB1 Boiler – Bag Filter weekly Night Shift
Ee	PPM NB1 Boiler – Bag Filter monthly Day Shift
Ff	PPM NB1 Boiler – Bag Filter monthly Night Shift
Gg	Bag Filter Manufacturer Operating and Maintenance Instructions

Hh	Copy of Process Control Room Shift Tasks and log
Ii	Photo of the SCADA screen – bag filter status during the cleaning cycle
Jj	Photo of the SCADA screen – bag filter cleaning status
Kk	Training Eg 1 schedule
Ll	Training Eg2 certification
Mm	Root causation review
Nn	SCADA EXHAUST DIAGRAM indicating flow right to left.
Oo	SOP013 CHP Emergency Stop
Pp	Support contract from Uniconfort