

Environment Agency permitting decisions

Variation

We have decided to issue the variation for Devonport Royal Dockyard Boiler Houses operated by Devonport Royal Dockyard Limited.

The variation number is EPR/RP3135LP/V002.

We consider in reaching that decision we have taken into account all relevant considerations and legal requirements and that the permit will ensure that the appropriate level of environmental protection is provided.

Purpose of this document

This decision document:

- explains how the application has been determined
- provides a record of the decision-making process
- shows how all relevant factors have been taken into account
- justifies the specific conditions in the permit other than those in our generic permit template.

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Structure of this document

- Key issues
- Annex 1 the decision checklist

Key issues of the decision

This application is to replace the three gas fuelled boilers in boiler house Fleet Maintenance Base (FMB) with two new 15.5MW thermal input capacity gas fuelled boilers. This will give the facility an aggregated net thermal input of 75MW. The location of the emission points has not changed so a new site plan was not requested.

The site will be using steam from a nearby Energy from Waste (EfW) plant for the majority of the year. These boilers will be used to supplement the steam from the EfW facility in winter, and in a back up capacity when the EfW is in a period of planned or unplanned shutdown. Using the steam from the EfW plant is an environmental improvement for the facility, as the boilers on site will need to be used less, reducing fossil fuel usage.

Emissions to air

The applicant has undertaken a H1 Tool risk assessment based on nitrogen dioxide (NO₂) emissions data provided by the boiler manufacturer. The H1 risk assessment looked at two possible scenarios of boiler use, one where both

boilers are used all the time and a second where only one boiler is operational at a time, running at 50% load. Table 1 shows the results from the operator's H1 assessment, the process contribution (PC) compared against Environmental Quality Standard (EQS).

Table 1

Scenario	NO ₂ Long-term EQS (µg/m ³)	NO ₂ Short-term EQS (µg/m ³)	Long term PC (µg/m ³)	% PC of long term EQS	Short term PC (µg/m ³)	% PC of short term EQS
1	40	200	2.51	6.26	118	59.7
2	40	200	0.626	1.57	29.6	14.8

Process contributions can be considered insignificant if:

- The long term process contribution is <1% of the long term environmental standard; and
- The short term process contribution is <10% of the short term environmental standard.

None of the scenarios screen out as being insignificant, so need to be considered alongside the background levels to assess whether the EQS has the potential to be exceeded. We believe the operator has used an inappropriate background figure for NO₂ in their H1 impact assessment. A projection for 2013 was used rather than the monitored data from the last year it was available, 2011. However, the use of a more appropriate value from the accumulated data for 2011 (10.48 µg/m³), does not affect the conclusions that can be made from their H1 Assessment. Table 2 below shows the PC added to the background (from the 2011 data set) which gives the Predicted Environmental Concentration (PEC).

Table 2

Scenario	Back-ground $\mu\text{g}/\text{m}^3$	Long term PEC $(\mu\text{g}/\text{m}^3)$	PEC percentage of EQS	Short term PC $(\mu\text{g}/\text{m}^3)$	20% (EQS short term – 2*background concentration long term)	Headroom (EQS –(PC short term plus 2xbackground)
1	10.48	12.99	32.48	118	35.81	61.04
2	10.48	11.11	27.77	29.6	35.81	Not assessed

Long term emissions are considered unlikely to give rise to an exceedance of an environmental standard where:

PC long term + background concentration < 70% of the environmental standard.

Short term emissions do not require more detailed assessment where:

PC (short term) < 20% (environmental standard short term – 2*background concentration long term)

The long term emissions from scenario 1 (when both boilers are used at once in the circumstance when the off-site source of steam from the EfW facility is unavailable), are unlikely to have a significant impact in line with the screening criteria above. The short term emissions from scenario one where both boilers were running constantly suggested that a more detailed assessment may be required.

The second scenario screening assessment represents the likely typical operating mode for winter, meaning that for much of the time the boilers are operating to supplement the steam sourced from the EfW facility. Both the long term and short term emissions from the second scenario screened out as not requiring further assessment and in line with the screening criteria above, are unlikely to have a significant effect.

The operator has stated that further modelling is not necessary for the short term emissions from scenario one, as the site will utilise steam from a nearby EfW facility for the majority of the year. The boilers will only be used as described in scenario one when the energy from waste facility is not operating (annual or emergency shutdown periods only). They also state that the new boilers will replace the emissions from the existing boilers used currently, and that these emissions are already included in the current background. This means that the H1 risk assessment has over-estimated the predicted impact of the new boilers for both scenarios.

We would normally require an operator to undertake a more detailed modelling assessment when H1 indicates that the short term PC is more than 20% of the EQS minus twice the background value. However, we have not requested this in this circumstance, as we consider that the new boilers are

unlikely to cause an exceedence of the short term (hourly) EQS for NO₂. This is because the short term PC from the worst case scenario (scenario one) when both boilers are running continuously together, is still significantly below the EQS (see headroom in table 2). The PC is 118 µg/m³ and the short term EQS is 200 µg/m³. Our guidance document H1 annex F details that:

Detailed assessment of short-term effects is often complex as the maximum process contribution and maximum background concentration may be separated both temporally and spatially, so that the addition of the two “worst case” concentrations together may not represent a likely event. A pragmatic approach is suggested, where the short term background concentration is taken to be twice the long term background concentration.

Given that the normal mode of operation for this replacement boiler plant will be as a limited supplementary support to the installation steam requirements, we agree with the operators conclusion that there is unlikely to be any significant impact on the environment as a result of the operation of the plant.

Although emissions from the replacement plant when operating under scenario one can not be described as insignificant, this mode of operation will only take place infrequently. For the majority of the time the replacement plant will operate as scenario two (limited supplementary utilisation of a single boiler plant unit), and in this circumstance we conclude that emissions from the replacement plant can be considered unlikely to have a significant effect.

Nitrogen oxide emissions are a key issue for this sector, as is the emission of sulphur dioxide and particulate matter. As the facility will use natural gas, we have not assessed the impact of emissions of sulphur dioxide as we consider natural gas to represent a sulphur free fuel, in accordance with our guidance document ‘Environmental Permitting Regulations (EPR) 1.01 How to Comply with your Environmental Permit: Additional Guidance for Combustion Activities’. The impact from particulates has not been assessed as gas fired plant is unlikely to generate particulates in sufficient quantities to warrant abatement, this is more particularly an issue for solid fuel fired plant as outlined in our EPR 1.01 guidance document.

Emission Limit Value (ELV)

The application states that 175mg/m³ of oxides of Nitrogen (NO and NO₂ expressed as NO₂) will be released as an hourly average. This is the same as the emission limit value for the current boilers. The new boilers will use low NO_x burners to minimise NO_x emissions. Their H1 tool risk assessment uses a short term release rate of 100 mg/m³ NO₂ as a worst case scenario. We consider that new efficient boilers are capable of better environmental performance than their current boilers and have therefore set an emission limit value of 140mg/m³. This figure was derived from the DEFRA (Department for Environment, Food and Rural Affairs) guidance note ‘Process Guidance Note 1/03 (12) Statutory Guidance for Boilers and Furnaces 20-50MW thermal input’. As the combined thermal input of the two new boilers is 31 MW, the guidance for boilers of 20-50MW capacity is more appropriate in this case.

Risk to water

There are seven raw materials which will be used to maintain the new boilers. The site is a dockyard so is in close proximity to the water. The raw materials have hazardous properties that could harm aquatic life if released, particularly the neutralising amine. Liquid raw materials will be supplied in 20 litre plastic containers. These will be stored within the boiler house on sealed concrete floors within plastic bunding. This bunding is impervious to the raw materials stored and has a capacity of over 25% of the total volume of the containers stored. A maximum of 650 litres of the liquid raw materials will be stored at any one time. If a spill occurs, spill kits will be used to contain the spillage prior to disposal. We are satisfied that these measures adequately mitigate the risk of pollutant emission to water.

Boiler blow down is discharged to sewer currently, and will continue to do so following this variation. We consider that the properties of the neutralising amine raw material that makes it a risk to aquatic life will be modified by its use in the condensate. We do not consider that this variation will increase the environmental risk of the discharge of the blow down to sewer.

Annex 1: decision checklist

This document should be read in conjunction with the Duly Making checklist, the application and supporting information and permit/ notice.

Aspect considered	Justification / Detail	Criteria met
		Yes
Operator		
Control of the facility	We are satisfied that the applicant (now the operator) is the person who will have control over the operation of the facility after the grant of the permit. The decision was taken in accordance with Environmental Permitting Regulations (EPR) Regulatory Guidance Note (RGN) 1 Understanding the meaning of operator.	✓
European Directives		
Applicable directives	All applicable European directives have been considered in the determination of the application.	✓
The site		
Biodiversity, Heritage, Landscape and Nature Conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>The boiler house is within 2km of a Special Protection Area (SPA), Special Area of Conservation (SAC), two local wildlife sites and an ancient woodland.</p> <p>A full assessment of the application and its potential to affect the sites has been carried out as part of the permitting process. We consider that the application will not affect the features of the sites. See key issues section for more details.</p> <p>We have not formally consulted on the application. The decision was taken in accordance with our guidance.</p>	✓
Environmental Risk Assessment and operating techniques		
Environmental risk	<p>We have reviewed the operator's assessment of the environmental risk from the facility.</p> <p>The operator's risk assessment is satisfactory apart from the background figure chosen, as discussed in the emission to air section above.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	The assessment shows that, applying the conservative criteria in our guidance on Environmental Risk Assessment, all emissions may be categorised as unlikely to have a significant effect.	
Operating techniques	<p>We have reviewed the techniques used by the operator and compared these with the relevant guidance notes. The key measures that the operator are proposing to use are:</p> <ul style="list-style-type: none"> • Use energy efficient new boilers, maintained to run efficiently. This is a requirement of section 1.1 of our guidance document EPR1.01; • Using natural gas from the national grid as fuel; • Using low NO_x burners and oxygen control to optimise combustion. This is a requirement of section 3.2 of our guidance document EPR1.01; • Optimising boiler water quality using a water softener, oxygen scavenger, pH adjustment and a reducing agent. <p>The proposed techniques/ emission levels for priorities for control are in line with the benchmark levels contained in the guidance notes 'EPR 1.01 How to Comply with your Environmental Permit: Additional Guidance for Combustion Activities' and 'Process Guidance Note 1/03 (12) Statutory Guidance for Boilers and Furnaces 20-50MW thermal input'. We consider them to represent appropriate techniques for the facility. The permit conditions ensure compliance with relevant Best Available Techniques Reference Documents (BREFs) and Best Available Techniques (BAT) Conclusions.</p> <p>We consider that the emission limits included in the installation permit reflect the BAT for the sector.</p>	✓
The permit conditions		
Incorporating the application	<p>We have specified that the applicant must operate the permit in accordance with descriptions in the application, including all additional information received as part of the determination process.</p> <p>These descriptions are specified in the Operating Techniques table in the permit.</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	<p>The supporting information of the application has been incorporated as it details the pollution control measures that will be used, the raw materials that will be used and how the operator will control the risk associated with the storage of these raw materials.</p>	
Emission limits	<p>We have decided that emission limits should be set for the parameters listed in the permit.</p> <p>The following substances have been identified as being emitted in significant quantities and ELVs and equivalent parameters or technical measures based on BAT have been set for those substances. An ELV has been set for oxides of nitrogen expressed as NO₂. See ELV section in key issues for more detail.</p> <p>It is considered that the ELVs/ equivalent parameters or technical measures described above will ensure that significant pollution of the environment is prevented and a high level of protection for the environment secured.</p>	✓
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>The monitoring requirements have been set to mirror what is in the current permit, and what is in the guidance document 'Process Guidance Note 1/03 (12) Statutory Guidance for Boilers and Furnaces 20- 50MW thermal input'.</p> <p>We made these decisions in accordance with our guidance note 'M2 Monitoring of stack emissions to air' which states that the monitoring standard BS EN 14792 is the appropriate standard for monitoring nitrogen dioxide and nitrogen monoxide.</p> <p>It is a requirement of the current permit that all monitoring that takes place will be undertaken in line with the Environment Agency's Monitoring Certification Scheme (MCERTS) requirements. The operator has stated that monitoring will be undertaken in accordance with our</p>	✓

Aspect considered	Justification / Detail	Criteria met
		Yes
	guidance note 'M1 Sampling requirements for stack emissions monitoring'.	
Reporting	We have specified reporting in the permit. The reporting frequencies mirror what is currently undertaken on the existing boilers.	✓
Operator Competence		
Environment management system	There is no known reason to consider that the operator will not have the management systems to enable it to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	✓
Financial provision	There is no known reason to consider that the operator will not be financially able to comply with the permit conditions. The decision was taken in accordance with RGN 5 on Operator Competence.	✓