



Environment
Agency

Notice of variation with introductory note

The Environmental Permitting (England & Wales) Regulations 2010

E.ON UK PLC

Connah's Quay Power Station
Kelsterton Road
Connah's Quay
Deeside
Flintshire
CH5 4BP

Variation application number
EPR/MP3337SH/V005

Permit number
EPR/MP3337SH

Connah's Quay power station

Permit number EPR/MP3337SH

Introductory note

This introductory note does not form a part of the notice

The following notice gives notice of the variation of an environmental permit.

This normal variation authorises the operator (E.ON UK Plc) to change their cooling water dosing system from Sodium Hypochlorite to Chlorine Dioxide at Connah's Quay Power Station. There are no changes to any of the activities listed within table S1.1 of the permit.

Water used for cooling the condenser is abstracted from the River Dee, held within an onsite storage pond, circulated through low level hybrid cooling towers (where heat is rejected to atmosphere via conduction, convection and evaporation), and then discharged back into the Dee Estuary under specific conditions (following a period within an onsite purge pond).

The change follows a permitted trial completed by the Operator using Chlorine Dioxide dosing within unit 4 cooling system (May to October 2009).

The main impact from the change concerns changes to water emissions discharged back into the River Dee. The by-products of sodium hypochlorite use are known to be both toxic and persistent. The change to a chlorine dioxide system will see these by-products eliminated from the discharge.

Chlorine dioxide is of moderate to high acute toxicity, but does not have an EQS because it not found to be persistent (although highly reactive). The main decomposition by-products are chlorite (of high toxicity), chlorate (generally low toxicity), and chloride (non-toxic for estuarine environments). The presence of the chlorite ion will however be transitory due to its decay within the environment.

In addition to the assessments and modelling carried out (for the impacts upon the Dee) this variation notice contains specific monitoring requirements in order to validate any assumptions and methodologies made within the application.

Changing to Chlorine Dioxide is considered to offer the power station a more effective method of preventing and removing bio films from the cooling system, together with the following environmental benefits:

- The elimination of halogenated organic compounds in the discharge - normally associated with hypochlorite dosing, and
- a significant increase to energy efficiency.

There will be no changes to the impacts from emissions to air, noise or odour.

The schedules specify the changes made to the original permit.

The status log of a permit sets out the permitting history, including any changes to the permit reference number.

Status Log of the permit		
Description	Date	Response Date
Application MP3337SH	Duly made 17/03/06	
Schedule 4 response (Additional Information)		26/10/06
Supplementary Information	20/11/06	20/11/06
Supplementary Information (email)	12/01/07	12/01/07
Permit MP3337SH determined	09/02/07	
Variation Application EA/EPR/MP3337SH/V002	Received 20/5/08 Duly Made 05/06/08	
Schedule 5 request for further information	14/09/08	01/09/08
Standard Variation EA/EPR/MP3337SH/V002 issued	29/09/08	
Simple Standard variation application EPR/MP3337SH/V003	Received 20/11/08 Duly Made 05/12/08	
Supplementary information request	10/10/08	23/10/08
Supplementary information request	23/02/09	27/02/09
Variation EPR/MP3337SH/V003 issued	18/03/09	
Application for variation EPR/MP3337SH/V004	Duly made 09/11/10	
Variation EPR/MP3337SH/V004 issued	07/12/10	
Application for standard variation and additional information received EPR/MP3337SH/V005	Received 09/12/2011 Duly Made 27/01/2012	
1 st Schedule 5 "Notice requiring further information" issued	29/02/2012	23/03/2012
Additional information received – Assessment of further Chlorite Decay Tests"		22/05/2012
2 nd Schedule 5 "Notice requiring further information" issued	04/07/2012	24/07/2012
Additional information received - Dosing systems		09/08/2012
Additional information received - Commissioning Information and Emission Limit Values / Monitoring		17/10/2012
Additional information received – various responses		26/10/2012
Additional information received – Timescales for staged commissioning programme		19/11/2012
Standard Variation EPR/MP3337SH/V005 Issued		06/12/2012

Other existing Licences/Authorisations/Registrations relating to this site		
Holder	Reference Number	Date of issue
EON UK PLC, Westwood Way, Westwood Business Park, Coventry, CV4 8LG	24/67/10/124/E ver 1 (Licence to abstract water)	25/10/1996
EON UK PLC, Westwood Way, Westwood Business Park, Coventry, CV4 8LG	24/67/10/124/E ver 2 (Licence to abstract water)	03/01/2007
EON UK PLC, Connah's Quay Power Station, Kelsterton Road, Connah's Quay , Deeside, Flintshire, CH5 4BP	EU-ETS:GB-EA-ETCO2-0179 (Emissions trading scheme)	

End of introductory note

Notice of variation

Environmental Permitting (England and Wales) Regulations 2010

The Environment Agency in exercise of its powers under regulation 20 of the Environmental Permitting (England and Wales) Regulations 2010 varies

Permit number

EPR/MP3337SH

issued to:

E.ON UK PLC (“the operator”)

whose registered office is

**Westwood Way
Westwood Business Park
Coventry
CV4 8LG**

company registration number **02366970**

to operate a regulated facility at

**Kelsterton Road
Connah’s Quay
Deeside
Flintshire
CH5 4BP**

to the extent set out in the schedules.

The notice shall take effect from 6th December 2012

Name

Date

Kelly Bailey

06/12/2012

Authorised on behalf of the Environment Agency

Schedule 1 – conditions to be deleted

No conditions are deleted.

Schedule 2 – conditions to be amended

The following conditions are amended as a result of the application made by the operator:

1. *Condition 2.6 is amended to include pre-operational conditions for future development:*

2.6 Pre-operational conditions

- 2.6.1 The operations specified in schedule 1 table S1.4B shall not commence until the measures specified in that table have been completed.

2. *Condition 3.4.3 is amended to read as follows:*

- 3.4.3 The operator shall carry out an annual noise monitoring and assessment exercise from the site (over a calendar year period) at the nearest sensitive receptors during day time and night time hours as per BS4142:1997. A full report together with any recommendations shall be submitted to the Environment Agency as soon as reasonably practicable following the report being made available.

3. *Table S1.2 (as referenced in condition 2.3.1) is amended to read as follows:*

Table S1.2 Operating techniques		
Description	Parts	Date Received
Application	Sections 2.1 & 2.2 of the application as well as other sections of the application	06/03/2006 (Received) 17/03/06 (Duly Made)
Response to Schedule 4 Notice Request issued on 29/09/06	Response to question 5, 6, 7, 8, 9, 10, 14, 15, 16, 29, detailing process control, 30 detailing emissions limits.	26/10/2006
Supplementary Information	Email from Bill Smith at E.ON – Connah’s Quay Power Station dated 12.01.07	12/01/2007
Supplementary Information	Letter dated 20 th November 2006 regarding two-shifting	22/11/2006
Standard Variation Application (EA/EPR/MP3337SH/V003)	Variation application Duly Made 05/06/08	20/05/2008
Standard Variation further information request	EPR Schedule 5 Variation Further Information request dated 14/09/08	01/09/2008
Variation Application EPR/MP3337SH/V004	Response to questions in Application Form EPC – Part C	09/11/2010
Standard Variation Application EPR/MP3337SH/V005	Sections 2.1 to 2.6 of the application “Connahs Quay Power Station Application to Vary Permit MP3337SH – Chlorine Dioxide Dosing System Modification – October 2011.	09/12/2011

Table S1.2 Operating techniques		
Description	Parts	Date Received
Response to Schedule 5 "Notice requiring further information"	The answer to question 10 of the Schedule 5 Notice (issued 29/02/2012) regarding monitoring methods and standards.	23/03/2012
Additional information received	Assessment of further Chlorite Decay Tests.	22/05/2012
Response to Schedule 5 "Notice requiring further information" dated	Response to Schedule 5 Notice	24/07/2012
Additional information	Information in relation to dosing systems	09/08/2012
Additional information	Appendix 1 - Additional Commissioning Information:- 1. Cooling tower dosing system description 2. Water Commissioning 3. Chemical Commissioning 4. Stage 1 of Proposed Chlorine Dioxide Introductory Dosing Plan 5. Stage 2 of Proposed Chlorine Dioxide Introductory Dosing Plan 6. Stage 3 of Proposed Chlorine Dioxide Introductory Dosing Plan Additional information supplied for clarification B5, Monitoring Methods Confirmation	17/10/2012
Additional information	Responses (Points 1 and 2).	26/10/2012
Additional information	Appendix 1 – Timescales (including durations).	19/11/2012

4. *Table S4.2 as referenced in condition 3.1.1 and 3.1.2 is amended is amended to read as follow:-*

Table S4.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements						
Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
W1 on site plan in schedule 2	Flow	Main cooling water purge to the River Dee	2.5m ³ /s	Instantaneous	Continuous	Note 4
	Temperature		25 ⁰ C			
	Temperature difference April - October		13 ⁰ C			
	Temperature difference November-March 95 percentile Maximum (⁰ C)		13 ⁰ C			
	Salinity		20 ⁰ C			
	pH Maximum		60g/l			
	pH Minimum		9			
	Residual Chlorine Dioxide Note 7		6			Note 1 Note 7

Table S4.2 Point Source emissions to water (other than sewer) – emission limits and monitoring requirements

Emission point ref. & location	Parameter	Source	Limit (incl. unit)	Reference period	Monitoring frequency	Monitoring standard or method
	Residual chlorite ion Note 7		10 mg/l (absolute limit) Note 1 Note 7			Note 5
	Residual chlorite ion Note 7		5 mg/l Note 1 Note 2 Note 7			
	Total Residual Oxidant (TRO) Note 6		0.2mg/l Note 6	Instantaneous		Note 4
	Oil and grease		20mg/l			Note 4
W2 on site plan in schedule 2	pH Maximum	Surface water drain	9	Instantaneous		Note 4
	pH Minimum		6			
	Oil and grease		20mg/l			Note 5
	Residual chlorine dioxide		Note 1			

- Note 1 Limit subject to change by the Environment Agency following completion of improvement condition IC21.
- Note 2 This limit shall be based upon a rate of 95% compliance of all average values in a 3 monthly period.
- Note 3 Average value of all instantaneous readings over a maximum 3 hour discharge period.
- Note 4 As described in the answer to Q10 of the Schedule 5 Notice dated 23/03/2012.
- Note 5 As detailed within Additional information supplied on 17th October 2012 "B5, Monitoring Methods Confirmation". Methods and standards are subject to change upon completion of pre-operational measure for future development PO2, Table S1.4B.
- Note 6 Compliance with Emission Limit Value and Monitoring requirements for Total Residual Oxygen (TRO) effective only during dosing of cooling waters with Sodium Hypochlorite.
- Note 7 Compliance with Emission Limit Values and Monitoring requirements for Residual Chlorine Dioxide and Residual chlorite ion effective only during dosing of cooling waters with Chlorine Dioxide.

5. *Table S5.4 amends the reporting form for water in order to take account for changes made to Table S4.2:*

Table S5.4 Reporting forms				
Media/ parameter	Reporting format	Starting Point	Agency recipient	Date of form
Water	Form water 1 or other form as agreed in writing by the Agency	Note 1	Site Inspector	01/12/2012

Note 1 Upon commissioning of the Chlorine Dioxide cooling water dosing system

Schedule 3 – conditions to be added

The following conditions are added as a result of the application made by the operator:

1. *Improvement programme requirements IC20 and IC21 are added to table S1.3 (as referenced in condition 2.5.1) as follows:*

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC20	<p>Following the completion of Stage 1 of the Chlorine Dioxide Introductory Dosing Plan, the Operator shall provide a written commissioning report to the Environment Agency on its implementation. The report shall include, but not be limited to:-</p> <ul style="list-style-type: none"> • monitoring results for residual chlorine dioxide and chlorite ions at the point of entry to the purge pond (from the cooling tower tanks) and exit of the purge pond (at the point of discharge to the River Dee), • an analysis of the monitoring data with consideration for the decay rates taking place within the purge pond under a range of operating conditions which are likely to occur, and • an assessment of whether additional controls are required to further minimise emissions to the River Dee. <p>The report shall identify any required improvements together with a proposed timetable for their implementation.</p>	21/06/2013 (or other date as agreed in writing with the Environment Agency).
IC21	<p>Following completion of Stage 2 of the Chlorine Dioxide Introductory Dosing Plan, the Operator shall provide a written commissioning report to the Environment Agency on its implementation. The report shall include, but not be limited to:-</p> <ul style="list-style-type: none"> • monitoring results for residual chlorine dioxide and chlorite ions at the point of entry to the purge pond (from the cooling tower tanks) and exit of the purge pond (at the point of discharge to the River Dee), • an analysis of the monitoring data with consideration for the decay rates taking place within the purge pond under a range of operating conditions which are likely to occur, • an assessment of whether additional controls are required to further minimise emissions to the River Dee, and • a revised environmental impact assessment for the discharge of residual chlorite ions upon the River Dee; <p>Following receipt of the commissioning report, the Environment Agency reserves the right to require the operator to conduct a physical survey within the River Dee (as notified in writing by the Environment Agency). Under such notification, the Operator shall submit proposals for carrying out such a survey, including but not limited to:-</p> <ul style="list-style-type: none"> • investigations of residual concentrations, • the effects from mixing, • re-assessment of the Predicted No-Effect Concentration 'PNEC' value, and • the zone within which the 'PNEC' is breached. <p>Where such a survey is required, this shall be done in accordance with a methodology and timetable agreed in writing by the Environment Agency.</p> <p>Data provided by this condition may be used as a means of imposing or amending permit conditions, including emission limit values for residual chlorite ions, and Residual chlorine dioxide (table S4.2).</p>	16/08/2012 (or other date as agreed in writing with the Environment Agency).

2. *Pre-operational measures PO1, PO2, PO3, PO4 and PO5 (as referenced in condition 2.6.1) are added as follows:*

Table S1.4B Pre-operational measures for future development		
Reference	Operation	Pre-operational measures
PO1	Chlorine Dioxide cooling water dosing system	The operator shall submit a report to the Environment Agency detailing changes made to the accident management plan (as required by condition 1.2.1 of the permit) at least 4 weeks prior to commencing this operation.
PO2		Prior to commencing commissioning, the operator shall provide a report to the Environment Agency describing the monitoring standards and methods used (including the relevant CEN, ISO or BS references) for all parameters listed in table S4.2. The report shall detail the scope of continuous monitoring (and / or any backup non-continuous monitoring) and the limit of detection for equipment proposed. Where the monitoring equipment, techniques, personnel and organisations employed do not have either MCERTS certification or accreditation (as appropriate), the Operator shall set out its justification and seek the written approval of the Environment Agency for this specification. Monitoring methods stated within table S4.2 may be subject to change upon completion of this condition.
PO3		The operator shall submit a report detailing changes made to the site closure plan (as referred to by conditions 2.7.2, 2.7.3 and 2.7.4 of the permit) at least 2 weeks prior to commencing this operation.
PO4		The operator shall submit a report detailing changes made to the site protection and monitoring programme (as referred to by conditions 2.8.1 and 2.8.2 of the permit) at least 2 weeks prior to commencing this operation.
PO5		Prior to specific dosing of the Cooling Tower Pack with Chlorine Dioxide. The Operator shall review proposed plans for stage 3 of the Chlorine Dioxide Introductory Dosing Plan (supplied as additional information on 17th October 2012 referenced Appendix 1 – “Additional Commissioning Information”) and submit a report to the Environment Agency detailing any required changes. Operational considerations shall be based on the outcomes to improvement conditions IC20 and IC21 (Table S1.3).

3. *The reporting of the following parameters are added to table S5.1:*

Table S5.1 Reporting of monitoring data			
Parameter	Emission or monitoring point / reference	Reporting Period	Period Begins
Residual Chlorine Dioxide Parameters as required by condition 3.5.1	W1, W2	Every 3 months Note 1	1/10/12
Residual Chlorite Ion Parameters as required by condition 3.5.1	W1	Every 3 months Note 1	1/10/12

Note 1 Monthly for the first 3 months of operation.

End of Notice