

<b>Description</b>	Pembroke Power Station Green Hydrogen Project Information requested by NRW in relation to NIA
<b>Date</b>	29 May 2025
<b>Issued by</b>	James Ward BSc (Hons) MIOA, Principal Consultant
<b>Issued to</b>	RWE Generation UK
<b>Ref No</b>	JW2515/22170

**Spectrum Acoustic Consultants report ref. PJ4207/22170/V1 – Proposal for a Green Hydrogen Project at Pembroke Power Station – 29/05/2024.**

The following queries have been received from NRW in relation to the above Noise Impact Assessment (NIA):

1. The NIA does not appear to contain a statement of competency for persons involved. Please confirm, with reference to 'required competency and standards' outlined in guidance *Noise and vibration management: environmental permits -GOV.UK* and *Method implementation document (MID) for BS 4142 -GOV.UK*.
2. The NIA does not appear to confirm 1) verification test results (calibration certificates) & dates for sound monitoring equipment; and 2) field calibration test results. See guidance *Method implementation document (MID) for BS 4142 -GOV.UK* (5.2 & 6.1).

Spectrum's response to the above queries is provided below and attached.

1. The survey work and reporting for the Noise Impact Assessment for the proposed RWE Pembroke Hydrogen Scheme was completed by Peter Jackson who has been employed as a Principal Consultant with Spectrum Acoustic Consultants Ltd for 35 years. Peter has worked predominantly in the Industrial / Engineering business group of Spectrum, specialising in work in the power generation sector. Qualifications include an MSc in Industrial Acoustics and full continuous membership of the Institute of Acoustics (IOA) since 1980, a period of 45 years.
2. To expand on Section 5.1 of the NIA, more details regarding the instrumentation used for the survey are provided in Table 1 below:

Instrument	Manufacturer and Model	Serial No.
Sound Level Meter	Brüel & Kjær 2250-Light	3006954
Microphone	Brüel & Kjær 4952	2922639
Acoustic Calibrator	Brüel & Kjær 4231	3010702
Sound Level Meter	Brüel & Kjær 2250	3027959
Microphone	Brüel & Kjær 4189	2919738
Acoustic Calibrator	Brüel & Kjær 4231	2688672
Sound Level Meter	Brüel & Kjær 2250	2739650
Microphone	Brüel & Kjær 4189	2983518
Acoustic Calibrator	Brüel & Kjær 4231	3018719
Weather Station	Davis Vantage Vue	001D0A80AC25

**Table 1:** Survey instrumentation details

The sound level meters used are all Class 1 conforming to BS EN 61672-1<sup>1</sup> and were field-calibrated before and after the survey with an acoustic calibrator conforming to BS EN 60942<sup>2</sup>. Results of the field calibration checks are included in Table 2 below, showing no significant drift throughout the survey.

The meters and microphones are laboratory calibrated biennially to UKAS procedures by a UKAS-accredited laboratory, and annually for the field calibrators. Copies of the calibration certificates are attached, valid for the period covered by the survey in the NIA.

Instrument	Pre-survey check (dB) @ 1kHz	Post-survey check (dB) @ 1kHz	Drift
Brüel & Kjær 2250-Light S/N 3006954	93.9	93.8	-0.1
Brüel & Kjær 2250 S/N 3027959	93.6	93.7	+0.1
Brüel & Kjær 2250 S/N 2739650	94.1	94.2	+0.1

**Table 2:** Field calibration check details, for a calibration level of 94.0 dB @ 1kHz

<sup>1</sup> BS EN 61672-1:20013 *Electroacoustics. Sound level meters – Part 1: Specifications*

<sup>2</sup> BS EN IEC 60942:2018 *Electroacoustics. Sound calibrators*

**CERTIFICATE OF CALIBRATION**

No: CDK2200514

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**CALIBRATION OF**

Sound Level Meter:	Brüel & Kjær Type 2250 Light	No: 3006954	Id: -
Microphone:	Brüel & Kjær Type 4952	No: 2922639	
PreAmplifier:	Brüel & Kjær Type Integrated		
Calibrator:	None		
Software version:	BZ7130 Version 4.7.6	Pattern Approval:	-
Instruction manual:	BE1746-18		

**CUSTOMER**

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

**CALIBRATION CONDITIONS**

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: *See actual values in sections.*

**SPECIFICATIONS**

The Sound Level Meter Brüel & Kjær Type 2250 Light has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

**PROCEDURE**

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.3 - DB: 8.30) by using procedure B&K proc 2250-L, 4952 (IEC 61672:2013).

**RESULTS**

Calibration Mode: **Calibration after repair/adjustment.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2022-01-20

Date of issue: 2022-01-20



Lene Petersen

Calibration Technician



Erik Bruus

Approved Signatory

## CERTIFICATE OF CALIBRATION

No: CDK2209390

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### CALIBRATION OF

Calibrator: Brüel & Kjær Type 4231 No: 3010702 Id: -  
Acoustical Adaptor: Brüel & Kjær Type UC-0210 (1/2" Adaptor)  
Pattern Approval: None

### CUSTOMER

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

### CALIBRATION CONDITIONS

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: *See actual values in sections.*

### SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC 60942:2017 Annex B - Microphone method. The accreditation assures the traceability to the international units system SI.

### PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Calibrator Calibration System 3630 with application software type 7763 (version 8.6 - DB: 8.60) by using procedure P\_4231\_4180\_M\_LS\_A01.


### RESULTS


Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2022-12-15

Date of issue: 2022-12-15

  
Susanne Jørgensen  
Calibration Technician

  
Nicki Eriksen  
Approved Signatory

**CERTIFICATE OF CALIBRATION**

No: CDK2205284

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**CALIBRATION OF**

Sound Level Meter:	Brüel & Kjær Type 2250	No: 3027959	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 2919738	
PreAmplifier:	Brüel & Kjær Type ZC-0032	No: 17552	
Calibrator:	None		
Software version:	BZ7223 Version 4.7.5	Pattern Approval:	PTBDE-16-M-PTB-0038 Rev 2 / DE-16-M-PTB-0039 Rev 2
Instruction manual:	BE1712-22		

**CUSTOMER**

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

**CALIBRATION CONDITIONS**

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: *See actual values in sections.*

**SPECIFICATIONS**

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

**PROCEDURE**

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.5 - DB: 8.50) by using procedure B&K proc 2250, 4189 (IEC 61672:2013).

**RESULTS**

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2022-07-15

Date of issue: 2022-07-15



Lene Petersen

Calibration Technician



Erik Bruus

Approved Signatory

## CERTIFICATE OF CALIBRATION

No: CDK2303485

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### CALIBRATION OF

Calibrator: Brüel & Kjær Type 4231 No: 2688672 Id: -  
Acoustical Adaptor: Brüel & Kjær Type UC-0210 (1/2" Adaptor)  
Pattern Approval: None

### CUSTOMER

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

### CALIBRATION CONDITIONS

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: See actual values in **Environmental conditions** section.

### SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC 60942:2017 Annex B - Microphone method. The accreditation assures the traceability to the international units system SI.

### PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Calibrator Calibration System 3630 with application software type 7763 (version 8.6 - DB: 8.60) by using procedure P\_4231\_4180\_M\_LS\_A01.

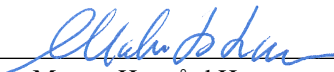
### RESULTS


Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device(s) under calibration. The results are only applicable for the specific device(s) listed above.

Date of calibration: 2023-05-12

Date of issue: 2023-05-12

  
Morten Høngård Hansen  
Calibration Technician

  
Susanne Jørgensen  
Approved Signatory

**CERTIFICATE OF CALIBRATION**

No: CDK2203884

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**CALIBRATION OF**

Sound Level Meter:	Brüel & Kjær Type 2250	No: 2739650	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 2983518	
PreAmplifier:	Brüel & Kjær Type ZC-0032	No: 14266	
Calibrator:	Brüel & Kjær Type 4231	No: 3018719	
Software version:	BZ7225 Version 4.7.5	Pattern Approval:	PTB1.63-4093056 / 1.63-4093058
Instruction manual:	BE1712-22		

**CUSTOMER**

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

**CALIBRATION CONDITIONS**

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: *See actual values in sections.*

**SPECIFICATIONS**

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

**PROCEDURE**

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.3 - DB: 8.40) by using procedure B&K proc 2250, 4189 (IEC 61672:2013).

**RESULTS**

Calibration Mode: **Calibration as received.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of calibration: 2022-05-18

Date of issue: 2022-05-18



Susanne Jørgensen  
Calibration Technician



Erik Bruus  
Approved Signatory

## CERTIFICATE OF CALIBRATION

No: CDK2305208

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### CALIBRATION OF

Calibrator: Brüel & Kjær Type 4231 No: 3030452 Id: -  
Acoustical Adaptor: Brüel & Kjær Type UC-0210 (1/2" Adaptor)  
Pattern Approval: DE-21-M-PTB-0029

### CUSTOMER

Spectrum Acoustics  
27-29 High Street  
SG18 0JE Biggleswade  
Bedfordshire, United Kingdom

### CALIBRATION CONDITIONS

Preconditioning: 4 hours at  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$   
Environment conditions: See actual values in **Environmental conditions** section.

### SPECIFICATIONS

The Calibrator Brüel & Kjær Type 4231 has been calibrated in accordance with the requirements as specified in IEC 60942:2017 Annex B - Microphone method. The accreditation assures the traceability to the international units system SI.

### PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Calibrator Calibration System 3630 with application software type 7763 (version 8.6 - DB: 8.60) by using procedure P\_4231\_4180\_M\_1\_A01.

### RESULTS

Calibration Mode: **Initial calibration.**

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device(s) under calibration. The results are only applicable for the specific device(s) listed above.

Date of calibration: 2023-07-12

Date of issue: 2023-07-12



Susanne Jørgensen  
Calibration Technician



Erik Bruus  
Approved Signatory