

Environmental Impact Assessment (EIA) Report

LT384 Tealing to Westfield Overhead Line (OHL) 400 kV Upgrade


November 2024





VOLUME 4 - APPENDIX 14.2: CALIBRATION CERTIFICATES

1. CALIBRATION CERTIFICATE NL52 00175536----- 1
2. CALIBRATION CERTIFICATE NC74 34178103 ----- 3

1. CALIBRATION CERTIFICATE NL52 00175536



**CERTIFICATE
OF
CALIBRATION**


0653

Date of Issue: 25 May 2022 **Certificate Number: UCRT22/1695**

Calibrated at & Certificate issued by:
ANV Measurement Systems
Beaufort Court
17 Roebuck Way
Milton Keynes MK5 8HL
Telephone 01908 642846 Fax 01908 642814
E-Mail: info@noise-and-vibration.co.uk
Web: www.noise-and-vibration.co.uk
Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems

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Approved Signatory



K. Mistry

Customer	Wood Group St. Vincent Plaza (Floor 2) 319 St. Vincent Street Glasgow G2 5LP																												
Order No.	26010406																												
Description	Sound Level Meter / Pre-amp / Microphone / Associated Calibrator																												
Identification	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Manufacturer</th> <th style="text-align: left;">Instrument</th> <th style="text-align: left;">Type</th> <th style="text-align: left;">Serial No. / Version</th> </tr> </thead> <tbody> <tr> <td>Rion</td> <td>Sound Level Meter</td> <td>NL-52</td> <td>00175536</td> </tr> <tr> <td>Rion</td> <td>Firmware</td> <td></td> <td>2.0</td> </tr> <tr> <td>Rion</td> <td>Pre Amplifier</td> <td>NH-25</td> <td>65638</td> </tr> <tr> <td>Rion</td> <td>Microphone</td> <td>UC-59</td> <td>13128</td> </tr> <tr> <td>Rion</td> <td>Calibrator</td> <td>NC-74</td> <td>34178103</td> </tr> <tr> <td></td> <td>Calibrator adaptor type if applicable</td> <td></td> <td>NC-74-002</td> </tr> </tbody> </table>	Manufacturer	Instrument	Type	Serial No. / Version	Rion	Sound Level Meter	NL-52	00175536	Rion	Firmware		2.0	Rion	Pre Amplifier	NH-25	65638	Rion	Microphone	UC-59	13128	Rion	Calibrator	NC-74	34178103		Calibrator adaptor type if applicable		NC-74-002
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Performance Class	1																												
Test Procedure	TP 10. SLM 61672-3:2013 <i>Procedures from IEC 61672-3:2013 were used to perform the periodic tests.</i>																												
Type Approved to IEC 61672-1:2013	Yes <i>If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2013</i>																												
Date Received	23 May 2022 ANV Job No. UKAS22/05346																												
Date Calibrated	25 May 2022																												

The sound level meter submitted for testing has successfully completed the periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organisation responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 specifications of IEC 61672-1:2013.

Previous Certificate	Dated	Certificate No.	Laboratory
	26 May 2020	UCRT20/1449	0653

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CERTIFICATE OF CALIBRATION
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Sound Level Meter Instruction manual and data used to adjust the sound levels indicated.

SLM instruction manual title	NL-52/NL-42 Description for IEC 61672-1		
SLM instruction manual ref / issue	No. 56034 21-03	Source	Rion
Date provided or internet download date	19 March 2021		
	Case Corrections	Wind Shield Corrections	Mic Pressure to Free Field Corrections
Uncertainties provided	Yes	Yes	Yes
Total expanded uncertainties within the requirements of IEC 61672-1:2013			
	YES		
Specified or equivalent Calibrator	Specified		
Customer or Lab Calibrator	Customers Calibrator		
Calibrator adaptor type if applicable	NC-74-002		
Calibrator cal. date	24 May 2022		
Calibrator cert. number	UCRT22/1682		
Calibrator cal cert issued by Lab	0653		
Calibrator SPL @ STP	94.02	dB	Calibration reference sound pressure level
Calibrator frequency	1001.97	Hz	Calibration check frequency
Reference level range	Single dB		
Accessories used or corrected for during calibration - Extension Cable & Wind Shield WS-15			
Note - The Extension Cable was used between the SLM and the pre-amp for this calibration.			

Environmental conditions during tests			
	Start	End	
Temperature	24.65	24.37	± 0.30 °C
Humidity	48.5	48.7	± 3.00 %RH
Ambient Pressure	100.05	100.05	± 0.03 kPa

Indication at the Calibration Check Frequency			
Initial indicated level	94.3	dB	Adjusted indicated level
			94.0 dB
Uncertainty of calibrator used for indication at the Calibration Check Frequency ±			
	0.10 dB		
Self Generated Noise			

Microphone installed -	Less Than	19.1	dB	A Weighting
Microphone replaced with electrical input device - UR = Under Range indicated				
Weighting	A	C	Z	
	13.1	16.9	23.1	dB UR

Self Generated Noise reported for information only and not used to assess conformance to a requirement

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor $k=2$, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

END

Calibrated by: B. Bogdan

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2. CALIBRATION CERTIFICATE NC74 34178103

	<p>CERTIFICATE OF CALIBRATION</p>		 0653	
<p>Date of Issue: 24 May 2022 Calibrated at & Certificate issued by: ANV Measurement Systems Beaufort Court 17 Roebuck Way Milton Keynes MK5 8HL Telephone 01908 642846 Fax 01908 642814 E-Mail: info@noise-and-vibration.co.uk Web: www.noise-and-vibration.co.uk</p>	<p>Certificate Number: UCRT22/1682</p>			
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Approved Signatory				
 K. Mistry				
<p style="font-size: small; margin: 0;">Acoustics Noise and Vibration Ltd trading as ANV Measurement Systems</p>				
<p>Customer</p>	<p>Wood Group St. Vincent Plaza (Floor 2) 319 St. Vincent Street Glasgow G2 5LP</p>			
<p>Order No.</p>	<p>26010406</p>			
<p>Test Procedure</p>	<p>Procedure TP 1 Calibration of Sound Calibrators</p>			
<p>Description</p>	<p>Acoustic Calibrator</p>			
<p>Identification</p>	<p><i>Manufacturer</i> Rion</p>	<p><i>Instrument</i> Calibrator</p>	<p><i>Model</i> NC-74</p>	<p><i>Serial No.</i> 34178103</p>
<p>The calibrator has been tested as specified in Annex B of IEC 60942:2003. As public evidence was available from a testing organisation (PTB) responsible for approving the results of pattern evaluation tests, to demonstrate that the model of sound calibrator fully conformed to the requirements for pattern evaluation described in Annex A of IEC 60942:2003, the sound calibrator tested is considered to conform to all the class 1 requirements of IEC 60942:2003.</p>				
<p>ANV Job No.</p>	<p>UKAS22/05346</p>			
<p>Date Received</p>	<p>23 May 2022</p>			
<p>Date Calibrated</p>	<p>24 May 2022</p>			
<p>Previous Certificate</p>	<p><i>Dated</i> 22 May 2020</p>	<p><i>Certificate No.</i> UCRT20/1440</p>		
	<p><i>Laboratory</i> 0653</p>			
<p>This certificate is issued in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service. It provides traceability of measurement to the SI system of units and/or to units of measurement realised at the National Physical Laboratory or other recognised national metrology institutes. This certificate may not be reproduced other than in full, except with the prior written approval of the issuing laboratory.</p>				

CERTIFICATE OF CALIBRATION

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Measurements

The sound pressure level generated by the calibrator in its WS2 configuration was measured five times by the Insert Voltage Method using a microphone as detailed below. The mean of the results obtained is shown below. It is corrected to the standard atmospheric pressure of 101.3 kPa (1013 mBar) using original manufacturers information.

Test Microphone	<i>Manufacturer</i>	<i>Type</i>
	Brüel & Kjær	4134

Results

The level of the calibrator output under the conditions outlined above was

94.02 ± 0.10 dB rel 20 µPa

Functional Tests and Observations

The frequency of the sound produced was	1001.97 ± 0.12 Hz
The total distortion was	1.61 ± 0.11 % Distortion

During the measurements environmental conditions were

Temperature	23	to	24	°C
Relative Humidity	44	to	51	%
Barometric Pressure	99.4	to	99.5	kPa

The reported expanded uncertainty is based on a standard uncertainty multiplied by a coverage factor k=2, providing a coverage probability of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements.

The uncertainties refer to the measured values only with no account being taken of the ability of the instrument to maintain its calibration.

A small correction factor may need to be applied to the sound pressure level quoted above if the device is used to calibrate a sound level meter which is fitted with a free-field response microphone. See manufacturers handbook for details.

END

Note:

Calibrator adjusted prior to calibration?	NO
Initial Level	N/A dB
Initial Frequency	N/A Hz

Additional Comments The results on this certificate only relate to the items calibrated as identified above.

None

Calibrated by: B. Bogdan

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