APPENDIX 13.3: BASELINE NOISE DATA

1.1 Introduction

1.1.1 WSP has been instructed by Scottish & Southern Electricity Networks (SSEN) to undertake a baseline noise survey in support of the application for the North East 400kV Reinforcement Works, hereby referred to as the Proposed Development.

1.1.2 This report outlines the results of a baseline noise survey undertaken in November 2019, as well as providing details of the methodology and equipment used.

1.2 Methodology

1.2.1 A baseline noise survey was conducted between 12 and 21 November 2019 at ten locations, representative of residential receptors, along the length of the Proposed Development. The purpose of the survey was to establish existing background noise conditions to inform the subsequent noise assessment.

1.2.2 The survey was conducted with reference to BS 7445 and BS 4142. Measurements were made using a class 1 sound level meter as defined in BS EN 61672: 2013. The following noise parameters were recorded: $L_{eq}$, $L_{90}$, and $L_{max}$. The sound level meters were placed in free-field conditions with the microphone at a height of 1.5 metres above ground level at all measurement locations, measuring continuous ‘fast’ time weighted and ‘A’ frequency-weighted levels.

1.2.3 Long-term measurements were undertaken at four unattended locations (LT1 - LT4), measurements were taken over consecutive 5-minute intervals for the entire survey duration and converted to 15-minute intervals for data analysis. Short-term measurements were undertaken at six attended locations (ST1 - ST6), over discrete 15-minute time periods throughout the duration of the survey, for day (0700-1900), evening (1900-2300) and night-time (2300-0700) periods.

1.2.4 All noise monitoring equipment was calibrated on-site prior to and on completion of measurements, using a Rion NC-74 acoustic calibrator. Calibration levels showed no significant drift at the end of each survey period. Appendix 13.3.D presents the calibration certificates for the noise survey measurement equipment.

1.2.5 Weather conditions were monitored for the duration of the survey at long term position LT2, which was central in relation to the noise survey locations. In general, dry conditions with low wind speeds averaging 0-2m/s were observed during the survey, with occasional periods of inclement weather being experienced due to rainfall and gusts above 5m/s. Upon completion of the survey, periods of inclement weather were identified, and noise survey data gathered during these periods were omitted from the analysis.

1.2.6 Appendix 13.3.B presents Noise Monitoring Forms for all measurement locations including a complete time-history plot of the measurement parameters $L_{eq}$, $L_{max}$ and $L_{90}$ and observation notes, Appendix 13.3.C presents the Weather Monitoring Form.
1.3 Measurement Locations

1.3.1 Long-term and short-term measurement locations are shown in Table 1. A graphical overview of the measurement locations is provided in Appendix 13.3.A.

Table 1: Baseline Noise Survey Measurement Locations

<table>
<thead>
<tr>
<th>Location</th>
<th>Indicative Address</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>LT1</td>
<td>Viewmount Steading</td>
<td>408799</td>
<td>843879</td>
</tr>
<tr>
<td>LT2</td>
<td>Burnside of Gourdas</td>
<td>378163</td>
<td>841658</td>
</tr>
<tr>
<td>LT3</td>
<td>Near B917</td>
<td>352259</td>
<td>850642</td>
</tr>
<tr>
<td>LT4</td>
<td>Cockmuir</td>
<td>369756</td>
<td>831650</td>
</tr>
<tr>
<td>ST1</td>
<td>Corsmanhill Way</td>
<td>375517</td>
<td>821422</td>
</tr>
<tr>
<td>ST2</td>
<td>Brockhill View</td>
<td>375194</td>
<td>822102</td>
</tr>
<tr>
<td>ST3</td>
<td>Ferniebrae</td>
<td>371434</td>
<td>826659</td>
</tr>
<tr>
<td>ST4</td>
<td>Newton Auchaber</td>
<td>362944</td>
<td>840941</td>
</tr>
<tr>
<td>ST5</td>
<td>Burnfield Farm</td>
<td>354312</td>
<td>847930</td>
</tr>
<tr>
<td>ST6</td>
<td>Greenacres</td>
<td>389223</td>
<td>845160</td>
</tr>
</tbody>
</table>

1.4 Equipment

1.4.1 Table 2 shows the measurement equipment used during the survey. Calibration certificates are provided in Appendix 13.3.D.

Table 2: Baseline Noise Survey Measurement Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Sound Level Meter</th>
<th>Pre-Amp</th>
<th>Microphone</th>
<th>Certificate No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rion NL-52</td>
<td>320638</td>
<td>10646</td>
<td>3387</td>
<td>UCRT18/1415</td>
</tr>
<tr>
<td>Rion NL-52</td>
<td>632043</td>
<td>32071</td>
<td>5210</td>
<td>UCRT19/1999</td>
</tr>
<tr>
<td>Rion NL-52</td>
<td>1021289</td>
<td>21331</td>
<td>4345</td>
<td>UCRT19/1022</td>
</tr>
<tr>
<td>Rion NL-52</td>
<td>1021290</td>
<td>21332</td>
<td>4346</td>
<td>UCRT19/1696</td>
</tr>
<tr>
<td>Rion NL-52</td>
<td>1021291</td>
<td>21333</td>
<td>4347</td>
<td>UCRT19/1023</td>
</tr>
<tr>
<td>Rion NL-52</td>
<td>1021292</td>
<td>21334</td>
<td>4348</td>
<td>UCRT18/1885</td>
</tr>
<tr>
<td>Rion NC-74</td>
<td>35173440</td>
<td>N/A</td>
<td>N/A</td>
<td>UCRT19/1719</td>
</tr>
</tbody>
</table>
1.5 **Noise Survey Results**

1.5.1 **Table 3** presents a summary of ambient noise levels ($L_{Aeq}$) and representative background noise levels ($L_{A90}$), during the daytime (0700-2300) and night-time (2300-0700) periods. Noise monitoring forms including a complete set of measurement results are provided in Appendix 13.3.B.

**Table 3: Summary of Baseline Noise Survey Measurement Results**

<table>
<thead>
<tr>
<th>Location</th>
<th>Daytime Noise Level, dB</th>
<th>Night-time Noise Level, dB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$L_{Aeq,16h}$</td>
<td>$L_{A90,16h}$</td>
</tr>
<tr>
<td>LT 1</td>
<td>48</td>
<td>38</td>
</tr>
<tr>
<td>LT 2</td>
<td>44</td>
<td>32</td>
</tr>
<tr>
<td>LT 3</td>
<td>49</td>
<td>33</td>
</tr>
<tr>
<td>LT 4</td>
<td>49</td>
<td>32</td>
</tr>
<tr>
<td>ST 1</td>
<td>53</td>
<td>36</td>
</tr>
<tr>
<td>ST 2</td>
<td>44</td>
<td>36</td>
</tr>
<tr>
<td>ST 3</td>
<td>53</td>
<td>36</td>
</tr>
<tr>
<td>ST 4</td>
<td>51</td>
<td>30</td>
</tr>
<tr>
<td>ST 5</td>
<td>56</td>
<td>35</td>
</tr>
<tr>
<td>ST 6</td>
<td>50</td>
<td>28</td>
</tr>
</tbody>
</table>

**Notes**
- *1* Representative $L_{A90,7}$ derived using statistical analysis at long term measurement locations and averaged at short term measurement locations.

1.5.2 During the daytime, ambient noise levels across all measurement locations are within the range of 44-56 dB $L_{Aeq}$, and representative background noise levels fall between 28-38 dB $L_{A90}$. Whereas in the night-time ambient noise levels are within the range of 27-43 dB $L_{Aeq}$, and background noise levels fall between 21-37 dB $L_{A90}$.

1.6 **Summary**

1.6.1 WSP has undertaken a baseline noise survey between 12 and 21 November 2019, to establish existing background noise conditions at representative locations along the length of the proposed North East 400kV Reinforcement Works development.

1.6.2 Measurements were conducted in line with BS 7445 and BS 4142, in ten locations representative of noise sensitive residential receptors. Inclement weather conditions have been identified and omitted from the data.

1.6.3 This report summarises the results of the baseline noise survey, which have been used in the noise assessment of the Proposed Development.
APPENDIX 13.3.A: NOISE MONITORING LOCATIONS
Baseline Noise Survey Locations - Nov 2019

Legend
- Proposed OHL Route
- Baseline Noise Survey Locations - Nov 2019

1:1,750,000 Scale

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APPENDIX 13.3.B: NOISE MONITORING FORMS
Noise Monitoring Form

Project Name: SSE North East 400kv OHL
Location: LT1 (s/n: 1021289)
Engineer: Leonard Terry

Equipment: Rion NL-52
Pre-Calibration Level: 94.0
Post-Calibration Level: 94.0
Weather: See weather monitoring form

Additional Comments:

<table>
<thead>
<tr>
<th>Measurement Period</th>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
<td></td>
</tr>
<tr>
<td>21/11/2019</td>
<td>11:30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Wind noise and occasional vehicle passby were the primary noise sources at time of deployment.

Description of Audible Noise

![Graph showing sound pressure level measurements over time]
### Noise Monitoring Form

**Project Name:** SSE North East 400kv OHL  
**Location:** LT1 (s/n: 1021289)  
**Project No:** 70021950  
**Engineer:** Leonard Terry  
**Equipment:** Rion NL-52  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  

**Weather:** See weather monitoring form

#### Additional Comments:

<table>
<thead>
<tr>
<th>Measurement Period</th>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
</tr>
<tr>
<td></td>
<td>21/11/2019</td>
<td>11:30</td>
<td></td>
</tr>
</tbody>
</table>

**Description of Audible Noise:**

Wind noise and occasional vehicle passby were the primary noise sources at time of deployment.

![Graph of Sound Pressure Level (dB) over time](image1.png)

- **Leq**
- **Lmax**
- **L90**
- **Omitted Data**
### Noise Monitoring Form

<table>
<thead>
<tr>
<th>Measurement Period</th>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
<th>Description of Audible Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
<td>Wind noise and slight foliage rustle were the primary noise sources at time of deployment</td>
</tr>
<tr>
<td></td>
<td>21/11/2019</td>
<td>11:30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sound Pressure Level (dB)**

- **Leq**
- **Lmax**
- **L90**
- **Omitted Data**

---

**SSE North East 400kv OHL**

**Project No:** 70021950

**Location:** LT2

**Equipment:** Rion NL-52 (s/n: 1021290)

**Pre-Calibration Level:** 94.0

**Post-Calibration Level:** 94.0

**Engineer:** Leonard Terry

**Weather:** See weather monitoring form
Noise Monitoring Form

Project Name: SSE North East 400kv OHL  
Project No: 70021950  
Location: LT2  
Engineer: Leonard Terry  
Equipment: Rion NL-52 (s/n: 1021290)  
Weather: See weather monitoring form  
Pre-Calibration Level: 94.0  
Post-Calibration Level: 94.0

Additional Comments:

<table>
<thead>
<tr>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td></td>
</tr>
<tr>
<td>21/11/2019</td>
<td>11:30</td>
<td>15 min</td>
</tr>
</tbody>
</table>

Description of Audible Noise

Wind noise and slight foliage rustle were the primary noise sources at time of deployment

Sound Pressure Level (dB)
### Noise Monitoring Form

**Project Name:** SSE North East 400kv OHL  
**Project No:** 70021950  
**Location:** LT3  
**Engineer:** Leonard Terry  
**Equipment:** Rion NL-52 (s/n: 320638)  
**Weather:** See weather monitoring form  

**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  

**Additional Comments:**

**Measurement Period** | **Date** | **Start / Stop Time** | **Measurement Intervals**  
--- | --- | --- | ---  
12/11/2019 | 13:00 | 15 min  
21/11/2019 | 08:15 |  

**Description of Audible Noise**

Wind noise and occasional vehicle passby on nearby B-road were primary sources of noise at time of deployment.
Noise Monitoring Form

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>SSE North East 400kv OHL</th>
<th>Project No:</th>
<th>70021950</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>LT3</td>
<td>Engineer:</td>
<td>Leonard Terry</td>
</tr>
<tr>
<td>Equipment:</td>
<td>Rion NL-52 (s/n: 320638)</td>
<td>Weather:</td>
<td>See weather monitoring form</td>
</tr>
<tr>
<td>Pre-Calibration Level:</td>
<td>94.0</td>
<td>Post-Calibration Level:</td>
<td>94.0</td>
</tr>
</tbody>
</table>

Additional Comments:

Measurement Period

<table>
<thead>
<tr>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
</tr>
<tr>
<td>21/11/2019</td>
<td>08:15</td>
<td></td>
</tr>
</tbody>
</table>

Description of Audible Noise

Wind noise and occasional vehicle passby on nearby B-road were primary sources of noise at time of deployment.

![Sound Pressure Level (dB) Graph](image1.png)

- Leq
- Lmax
- L90
- Omitted Data

![Measurement Setup](image2.png)
## Noise Monitoring Form

<table>
<thead>
<tr>
<th>Measurement Period</th>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
</tr>
<tr>
<td></td>
<td>21/11/2019</td>
<td>09:45</td>
<td></td>
</tr>
</tbody>
</table>

### Description of Audible Noise

Wind noise and occasional car passby were primary sources of noise at time of deployment.

### Sound Pressure Level (dB)

- **Leq**
- **Lmax**
- **L90**
- **Omitted Data**

---

**Project Name:** SSE North East 400kv OHL  
**Project No:** 70021950  
**Location:** LT4  
**Equipment:** Rion NL-52 (s/n: 1021291)  
**Engineer:** Leonard Terry  
**Weather:** See weather monitoring form
Noise Monitoring Form

Project Name: SSE North East 400kv OHL
Location: LT4
Project No: 70021950
Engineer: Leonard Terry

Equipment: Rion NL-52 (s/n: 1021291)
Pre-Calibration Level: 94.0
Post-Calibration Level: 94.0
Weather: See weather monitoring form

Additional Comments:

<table>
<thead>
<tr>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td>15 min</td>
</tr>
<tr>
<td>21/11/2019</td>
<td>09:45</td>
<td></td>
</tr>
</tbody>
</table>

Measurement Period

Description of Audible Noise

Wind noise and occasional car passby were primary sources of noise at time of deployment

Sound Pressure Level (dB)
**Noise Monitoring Form**

**Project Name:** SSE North East 400kv OHL  
**Location:** ST1 - Corsmanhill Way  
**Engineer:** Leonard Terry, Iain Kelly  
**Equipment:** Rion NL-52 (s/n: 01021292)  
**Project No:** 70021950  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  

**General Weather Description:** Generally dry with wind speeds <5m/s, Occasional periods of light rain/drizzle.

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>L_{Aeq}</th>
<th>L_{Amax}</th>
<th>L_{A10}</th>
<th>L_{A90}</th>
<th>Description of Audible Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019 14:35</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>7°</td>
<td>49.4</td>
<td>75.8</td>
<td>50.4</td>
<td>43.1</td>
<td>Constant RTN from A96, occasional vehicle pass, construction work audible</td>
</tr>
<tr>
<td>12/11/2019 14:50</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>7°</td>
<td>48.1</td>
<td>69.1</td>
<td>48.1</td>
<td>42.1</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 08:49</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>7°</td>
<td>60.8</td>
<td>79.1</td>
<td>59.9</td>
<td>45.7</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 15:41</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>7°</td>
<td>53.0</td>
<td>78.3</td>
<td>52.7</td>
<td>41.4</td>
<td></td>
</tr>
<tr>
<td>19/11/2019 10:15</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>49.1</td>
<td>61.7</td>
<td>52.9</td>
<td>41.2</td>
<td></td>
</tr>
<tr>
<td>12/11/2019 19:08</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>5°</td>
<td>43.8</td>
<td>73.8</td>
<td>45.6</td>
<td>39.4</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 21:46</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>5°</td>
<td>39.5</td>
<td>56.9</td>
<td>42.6</td>
<td>33.1</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 22:47</td>
<td>00:15:00</td>
<td>2 - 4 m/s</td>
<td>5°</td>
<td>38.5</td>
<td>53.8</td>
<td>41.7</td>
<td>32.5</td>
<td>Constant distant RTN from A96</td>
</tr>
<tr>
<td>20/11/2019 19:17</td>
<td>00:15:00</td>
<td>4°</td>
<td>-</td>
<td>46.5</td>
<td>62.1</td>
<td>50.1</td>
<td>38.7</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 00:04</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-2°</td>
<td>37.9</td>
<td>56.9</td>
<td>40.3</td>
<td>24.7</td>
<td></td>
</tr>
<tr>
<td>21/11/2019 01:16</td>
<td>00:15:00</td>
<td>-</td>
<td>-</td>
<td>37.2</td>
<td>55.2</td>
<td>39.3</td>
<td>31.8</td>
<td>Occasional distant RTN from A96</td>
</tr>
</tbody>
</table>
### Noise Monitoring Form

**Project Name:** SSE North East 400kV OHL  
**Location:** ST2 - Brockhill View  
**Equipment:** Rion NL-52 (s/n: 01021292)  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  
**General Weather Description:** Generally dry with wind speed <5m/s, occasional periods of light rain/drizzle.

### Measurement Period

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>$L_{Aeq}$</th>
<th>$L_{Amax}$</th>
<th>$L_{A10}$</th>
<th>$L_{A90}$</th>
<th>Description of Audible Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019 13:56</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>7°</td>
<td>45.4</td>
<td>61.8</td>
<td>47.7</td>
<td>42.1</td>
<td><strong>Daytime Period:</strong> Constant RTN from A96, occasional vehicle pass, overhead line crackle just perceptible during period of light drizzle</td>
</tr>
<tr>
<td>12/11/2019 14:11</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>7°</td>
<td>49.5</td>
<td>73.4</td>
<td>50.4</td>
<td>44.4</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 09:10</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>5°</td>
<td>48.0</td>
<td>75.2</td>
<td>46.6</td>
<td>35.2</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 15:19</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>5°</td>
<td>41.8</td>
<td>61.5</td>
<td>42.7</td>
<td>34.6</td>
<td></td>
</tr>
<tr>
<td>19/11/2019 10:38</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>41.0</td>
<td>61.3</td>
<td>41.4</td>
<td>37.7</td>
<td></td>
</tr>
<tr>
<td>19/11/2019 13:08</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>42.7</td>
<td>58.2</td>
<td>42.8</td>
<td>39.2</td>
<td></td>
</tr>
<tr>
<td>12/11/2019 19:29</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>5°</td>
<td>41.2</td>
<td>68.6</td>
<td>42.1</td>
<td>32.2</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 22:06</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-1°</td>
<td>35.0</td>
<td>53.1</td>
<td>37.8</td>
<td>28.9</td>
<td><strong>Evening Period:</strong> Constant RTN from A96</td>
</tr>
<tr>
<td>13/11/2019 22:23</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-1°</td>
<td>34.5</td>
<td>52.7</td>
<td>37.5</td>
<td>27.9</td>
<td></td>
</tr>
<tr>
<td>20/11/2019 19:38</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>-</td>
<td>37.7</td>
<td>61.9</td>
<td>38.5</td>
<td>35.1</td>
<td></td>
</tr>
<tr>
<td>13/11/2019 23:42</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-1°</td>
<td>34.0</td>
<td>58.9</td>
<td>35.7</td>
<td>25.6</td>
<td><strong>Night-time Period:</strong> Occasional RTN on A96</td>
</tr>
<tr>
<td>21/11/2019 00:56</td>
<td>00:15:00</td>
<td>3 - 4 m/s</td>
<td>-</td>
<td>34.0</td>
<td>63.0</td>
<td>34.3</td>
<td>26.7</td>
<td></td>
</tr>
</tbody>
</table>
## Noise Monitoring Form

**Project Name:** SSE North East 400kV OHL  
**Location:** ST3 - Ferniebrae  
**Equipment:** Ron NL-52 (s/n: 01021292)  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  

**General Weather Description:** Generally dry with wind speeds <5m/s, Occasional periods of light rain/drizzle.

### Statistical Noise Levels / dB

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>$L_{Aeq}$</th>
<th>$L_{Amax}$</th>
<th>$L_{A10}$</th>
<th>$L_{A90}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019 13:27</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>7°</td>
<td>43.7</td>
<td>72.4</td>
<td>44.4</td>
<td>34.4</td>
</tr>
<tr>
<td>13/11/2019 09:41</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-1°</td>
<td>50.7</td>
<td>75.9</td>
<td>43.3</td>
<td>35.8</td>
</tr>
<tr>
<td>13/11/2019 14:47</td>
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<td>0 - 1 m/s</td>
<td>-1°</td>
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<td>31.8</td>
</tr>
<tr>
<td>19/11/2019 11:07</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
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<td>72.3</td>
<td>47.0</td>
<td>39.7</td>
</tr>
<tr>
<td>19/11/2019 13:58</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>49.8</td>
<td>73.0</td>
<td>47.9</td>
<td>43.1</td>
</tr>
<tr>
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<td>58.2</td>
<td>84.2</td>
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<td>30.8</td>
</tr>
<tr>
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<td>00:15:00</td>
<td>1 - 2m/s</td>
<td>-</td>
<td>47.7</td>
<td>73.7</td>
<td>43.3</td>
<td>37.7</td>
</tr>
<tr>
<td>13/11/2019 23:15</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>33.8</td>
<td>52.9</td>
<td>33.9</td>
<td>27.4</td>
</tr>
<tr>
<td>21/11/2019 00:28</td>
<td>00:15:00</td>
<td>3 - 4 m/s</td>
<td>-</td>
<td>46.9</td>
<td>58.3</td>
<td>49.7</td>
<td>41.5</td>
</tr>
</tbody>
</table>

**Measurement Period:**
- **Daytime Period:** Distant RTN from A96, occasional vehicle passby
- **Evening Period:** Distant RTN from A96, occasional vehicle passby
- **Night-time period:** Occasional distant RTN from A96

---

**Engineer:** Leonard Terry · Iain Kelly  
**Date:** 12/11/2019
## Noise Monitoring Form

**Project Name:** SSE North East 400kV OHL  
**Location:** ST4 - Newton Auchaber  
**Engineer:** Leonard Terry, Iain Kelly  
**Project No:** 70021950

**Equipment:** Rion NL-52 (s/n: 01021292)  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  
**General Weather Description:** Dry, clear skies and wind speeds <5m/s

### Measurement Period

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>L_{Aeq}</th>
<th>L_{Amax}</th>
<th>L_{A10}</th>
<th>L_{A90}</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/11/2019 10:33</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>1°</td>
<td>48.4</td>
<td>72.1</td>
<td>47.2</td>
<td>28.8</td>
</tr>
<tr>
<td>13/11/2019 14:02</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>3°</td>
<td>55.0</td>
<td>78.4</td>
<td>51.3</td>
<td>24.3</td>
</tr>
<tr>
<td>14/11/2019 10:23</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>2°</td>
<td>49.0</td>
<td>75.0</td>
<td>39.1</td>
<td>32.7</td>
</tr>
<tr>
<td>14/11/2019 10:40</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>2°</td>
<td>49.3</td>
<td>76.0</td>
<td>37.4</td>
<td>31.4</td>
</tr>
<tr>
<td>14/11/2019 21:24</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>4°</td>
<td>57.5</td>
<td>85.2</td>
<td>48.3</td>
<td>36.7</td>
</tr>
<tr>
<td>14/11/2019 21:40</td>
<td>00:15:00</td>
<td>2 - 3 m/s</td>
<td>4°</td>
<td>32.8</td>
<td>55.6</td>
<td>33.2</td>
<td>29.9</td>
</tr>
<tr>
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<td>48.9</td>
<td>75.4</td>
<td>43.9</td>
<td>31.5</td>
</tr>
<tr>
<td>20/11/2019 13:57</td>
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<td>0 - 1 m/s</td>
<td>-</td>
<td>57.5</td>
<td>85.2</td>
<td>48.3</td>
<td>36.7</td>
</tr>
<tr>
<td>20/11/2019 20:55</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>30.5</td>
<td>60.8</td>
<td>30.1</td>
<td>26.0</td>
</tr>
<tr>
<td>20/11/2019 23:40</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>3°</td>
<td>32.3</td>
<td>56.4</td>
<td>31.3</td>
<td>28.5</td>
</tr>
<tr>
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<td>00:15:00</td>
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<td>-</td>
<td>67.8</td>
<td>105.5</td>
<td>50.5</td>
<td>34.5</td>
</tr>
</tbody>
</table>

### Description of Audible Noise

**Daytime Period:** Distant RTN, occasional farm activity, occasional vehicle passby, light aircraft overhead

**Evening Period:** Distant RTN, snow thaw trickle audible on 14/11/19

**Night-time Period:** Occasional distant RTN, snow thaw trickle audible on 14/11/19
## Noise Monitoring Form

**Project Name:** SSE North East 400kv OHL  
**Location:** STS - Burnfield Farm  
**Project No:** 70021950  
**Equipment:** Rion NL-52 (s/n: 01021292)  
**Engineer:** Leonad Terry, Iain Kelly  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0

### General Weather Description:
Dry, clear skies and wind speeds <5m/s

### Measurement Period

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>$L_{Aeq}$</th>
<th>$L_{Amax}$</th>
<th>$L_{A10}$</th>
<th>$L_{A90}$</th>
<th>Description of Audible Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/11/2019 11:32</td>
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<td>0 - 1 m/s</td>
<td>0°</td>
<td>63.0</td>
<td>86.3</td>
<td>57.4</td>
<td>31.8</td>
<td>Daytime Period: Distant RTN, frequent vehicle passby, nearby river very slightly audible</td>
</tr>
<tr>
<td>14/11/2019 11:30</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>2°</td>
<td>59.0</td>
<td>82.5</td>
<td>50.9</td>
<td>34.6</td>
<td>Evening Period: Distant RTN, nearby river very slightly audible</td>
</tr>
<tr>
<td>14/11/2019 11:46</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>2°</td>
<td>42.5</td>
<td>65.7</td>
<td>44.0</td>
<td>34.7</td>
<td>Daytime Period: Nearby river very slightly audible</td>
</tr>
<tr>
<td>14/11/2019 10:28</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>-</td>
<td>50.3</td>
<td>73.6</td>
<td>49.8</td>
<td>38.9</td>
<td></td>
</tr>
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<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>-</td>
<td>51.4</td>
<td>75.3</td>
<td>42.6</td>
<td>30.1</td>
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<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>3°</td>
<td>39.5</td>
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<td>36.9</td>
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</tr>
<tr>
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<td>00:15:00</td>
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<td>3°</td>
<td>39.5</td>
<td>59.4</td>
<td>41.0</td>
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<tr>
<td>20/11/2019 22:30</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>-</td>
<td>35.4</td>
<td>52.3</td>
<td>36.7</td>
<td>33.8</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 23:00</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>3°</td>
<td>41.1</td>
<td>56.4</td>
<td>42.7</td>
<td>39.3</td>
<td></td>
</tr>
<tr>
<td>20/11/2019 23:00</td>
<td>00:15:00</td>
<td>0 - 1 m/s</td>
<td>-</td>
<td>36.1</td>
<td>47.7</td>
<td>37.7</td>
<td>34.3</td>
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</tr>
</tbody>
</table>
### Noise Monitoring Form

**Project Name:** SSE North East 400kv OHL  
**Location:** STS - Greenacres  
**Equipment:** Rion NL-52 (s/n: 01021292)  
**Pre-Calibration Level:** 94.0  
**Post-Calibration Level:** 94.0  
**Engineer:** Leonard Terry, Iain Kelly

#### Measurement Period

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Elapsed Minutes</th>
<th>Wind Speed (m/s)</th>
<th>Temperature (°C)</th>
<th>L_{eq}</th>
<th>L_{Amax}</th>
<th>L_{A10}</th>
<th>L_{A90}</th>
<th>Description of Audible Noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>13/11/2019 12:41</td>
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<td>0°</td>
<td>41.0</td>
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<td>24.0</td>
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</tr>
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<td>0°</td>
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<td>77.7</td>
<td>41.0</td>
<td>22.2</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 13:06</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>2°</td>
<td>49.0</td>
<td>78.4</td>
<td>46.2</td>
<td>34.5</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 13:23</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>2°</td>
<td>51.6</td>
<td>75.4</td>
<td>54.0</td>
<td>38.9</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 13:40</td>
<td>00:15:00</td>
<td>1 - 2 m/s</td>
<td>2°</td>
<td>55.9</td>
<td>78.3</td>
<td>57.9</td>
<td>38.4</td>
<td></td>
</tr>
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<td>-</td>
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<td>72.4</td>
<td>46.8</td>
<td>30.5</td>
<td></td>
</tr>
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<td>82.8</td>
<td>47.2</td>
<td>29.2</td>
<td></td>
</tr>
<tr>
<td>14/11/2019 20:19</td>
<td>00:15:00</td>
<td>2 - 3 m/s</td>
<td>4°</td>
<td>40.6</td>
<td>63.6</td>
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<td>33.5</td>
<td></td>
</tr>
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<td>2 - 3 m/s</td>
<td>4°</td>
<td>34.5</td>
<td>56.0</td>
<td>36.7</td>
<td>30.2</td>
<td></td>
</tr>
<tr>
<td>19/11/2019 22:24</td>
<td>00:15:00</td>
<td>-</td>
<td>-</td>
<td>39.9</td>
<td>72.2</td>
<td>28.8</td>
<td>22.1</td>
<td></td>
</tr>
<tr>
<td>19/11/2019 22:41</td>
<td>00:15:00</td>
<td>-</td>
<td>-</td>
<td>27.5</td>
<td>53.1</td>
<td>29.2</td>
<td>21.9</td>
<td></td>
</tr>
<tr>
<td>15/11/2019 00:37</td>
<td>00:15:00</td>
<td>0 - 2 m/s</td>
<td>4°</td>
<td>26.8</td>
<td>50.4</td>
<td>29.3</td>
<td>20.0</td>
<td></td>
</tr>
<tr>
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<td>00:15:00</td>
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<td>-</td>
<td>27.0</td>
<td>55.0</td>
<td>29.4</td>
<td>21.3</td>
<td></td>
</tr>
</tbody>
</table>

**Weather:***
- Daytime Period: Distant RTN, occasional vehicle passby, light aircraft overhead, distant birdsong
- Evening Period: Distant RTN, occasional slight foliage movement
- Night-time period: Distant RTN

**General Weather Description:** Dry, clear skies and wind speeds <5m/s
APPENDIX 13.3.C: WEATHER MONITORING FORM
### Weather Monitoring Form

<table>
<thead>
<tr>
<th>Project Name:</th>
<th>SSE North East 400kv OHL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location:</td>
<td>LT2</td>
</tr>
<tr>
<td>Engineer:</td>
<td>Leonard Terry</td>
</tr>
<tr>
<td>Additional Comments:</td>
<td>Weather station placed in representative location adjacent to long term noise monitoring position LT2.</td>
</tr>
</tbody>
</table>

#### Measurement Period

<table>
<thead>
<tr>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td>10 min</td>
</tr>
<tr>
<td>21/11/2019</td>
<td>10:00</td>
<td></td>
</tr>
</tbody>
</table>

#### Equipment

- Davis Vantage Vue weather station

---

**Graph:**
- **Axes:**
  - Y-axis: Wind speed (m/s)
  - X-axis: Date (11/11/19 to 17/11/19)
- **Data Points:**
  - Average wind speed
  - Max wind gust
  - Rainfall (mm)
  - OMIT
- **Legend:**
  - Average wind speed
  - Max wind gust
  - Rainfall (mm)
  - OMIT

---

**Notes:**
- Wind speed and rainfall data recorded for the specified dates.
- Graph shows fluctuations in wind speed and rainfall over the measurement period.
Weather Monitoring Form

Project Name: SSE North East 400kv OHL
Project No: 70021950
Location: LT2
Engineer: Leonard Terry

Additional Comments: Weather station placed in representative location adjacent to long term noise monitoring position LT2.

Measurement Period

<table>
<thead>
<tr>
<th>Date</th>
<th>Start / Stop Time</th>
<th>Measurement Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/11/2019</td>
<td>13:00</td>
<td>10 min</td>
</tr>
<tr>
<td>21/11/2019</td>
<td>10:00</td>
<td></td>
</tr>
</tbody>
</table>

Equipment

Davis Vantage Vue weather station

![Graph showing wind speed and rainfall over a period from 18/11/19 to 24/11/19. The x-axis represents dates from 18/11/19 to 24/11/19, and the y-axis represents wind speed (m/s) on the left and rainfall (mm) on the right. The graph includes lines for average wind speed, max wind gust, rainfall (mm), and OMIT.]
APPENDIX 13.3.D: CALIBRATION CERTIFICATES
CERTIFICATE OF CALIBRATION

Date of Issue: 28 August 2018

Certificate Number: UCRT18/1885

Customer
WSP UK Ltd
3rd Floor, Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Order No. 20075476

Description
Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification
Manufacturer | Instrument | Type | Serial No. / Version
Rion | Sound Level Meter | NL-52 | 01021292
Rion | Firmware | 1.8
Rion | Pre Amplifier | NH-25 | 21334
Rion | Microphone | UC-59 | 04348
Rion | Calibrator | NC-74 | 34536109
Calibrator adaptor type if applicable | NC-74-002

Performance Class 1

Test Procedure
TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES Approval Number 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 23 August 2018 ANV Job No. UKAS18/08547
Date Calibrated 28 August 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate Dated 06 September 2016 Certificate No. TCRT16/1239 Laboratory ANV Measurement Systems

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

<table>
<thead>
<tr>
<th>SLM instruction manual title</th>
<th>Sound Level Meter</th>
<th>NL-42 / NL-52</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLM instruction manual ref / issue</td>
<td>11-03</td>
<td></td>
</tr>
<tr>
<td>SLM instruction manual source</td>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Internet download date if applicable</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Case corrections available</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Uncertainties of case corrections</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Source of case data</td>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Wind screen corrections available</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Uncertainties of wind screen corrections</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Source of wind screen data</td>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Mic pressure to free field corrections</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Uncertainties of Mic to F.F. corrections</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Source of Mic to F.F. corrections</td>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Total expanded uncertainties within the requirements of IEC 61672-1:2002</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Specified or equivalent Calibrator</td>
<td>Specified</td>
<td></td>
</tr>
<tr>
<td>Customer or Lab Calibrator</td>
<td>Lab Calibrator</td>
<td></td>
</tr>
<tr>
<td>Calibrator adaptor type if applicable</td>
<td>NC-74-002</td>
<td></td>
</tr>
<tr>
<td>Calibrator cal. date</td>
<td>06 August 2018</td>
<td></td>
</tr>
<tr>
<td>Calibrator cert. number</td>
<td>UCRT18/1784</td>
<td></td>
</tr>
<tr>
<td>Calibrator cal cert issued by</td>
<td>0653</td>
<td></td>
</tr>
<tr>
<td>Calibrator SPL @ STP</td>
<td>93.99 dB</td>
<td>Calibration reference sound pressure level</td>
</tr>
<tr>
<td>Calibrator frequency</td>
<td>1001.97 Hz</td>
<td>Calibration check frequency</td>
</tr>
<tr>
<td>Reference level range</td>
<td>25 - 130 dB</td>
<td></td>
</tr>
</tbody>
</table>

Accessories used or corrected for during calibration - Wind Shield WS-10
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests

| Temperature | Start | 21.81 | End | 22.05 | ± 0.30 °C |
| Humidity | 57.8 | 55.1 | ± 3.00 %RH |
| Ambient Pressure | 100.73 | 100.66 | ± 0.03 kPa |

Response to associated Calibrator at the environmental conditions above.

| Initial indicated level | 94.0 dB | Adjusted indicated level | 94.0 dB |
| The uncertainty of the associated calibrator supplied with the sound level meter ± | 0.10 dB |

Self Generated Noise This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

<table>
<thead>
<tr>
<th>Weighting</th>
<th>A</th>
<th>C</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.2 dB</td>
<td>UR</td>
<td>15.6 dB</td>
<td>UR</td>
</tr>
</tbody>
</table>

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

Calibrated by: A Patel

Additional Comments
None
Date of Issue: 07 January 2019

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

Customer
WSP UK Ltd
3rd Floor, Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Order No. 20084040
Description Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Instrument</th>
<th>Type</th>
<th>Serial No. / Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rion</td>
<td>Sound Level Meter</td>
<td>NL-52</td>
<td>01021291</td>
</tr>
<tr>
<td>Rion</td>
<td>Firmware</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Rion</td>
<td>Pre Amplifier</td>
<td>NH-25</td>
<td>21333</td>
</tr>
<tr>
<td>Rion</td>
<td>Microphone</td>
<td>UC-59</td>
<td>04347</td>
</tr>
<tr>
<td>Rion</td>
<td>Calibrator</td>
<td>NC-74</td>
<td>35125825</td>
</tr>
<tr>
<td></td>
<td>Calibrator adaptor type if applicable</td>
<td>NC-74-002</td>
<td></td>
</tr>
</tbody>
</table>

Performance Class 1
Test Procedure TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002 YES
Approval Number 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received 03 January 2019
ANV Job No. UKAS19/01011
Date Calibrated 07 January 2019

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate Dated Certificate No. Laboratory
10 January 2017 UCRT17/1010 7623

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

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

<table>
<thead>
<tr>
<th>SLM instruction manual title</th>
<th>SLM instruction manual ref / issue</th>
<th>SLM instruction manual source</th>
<th>Internet download date if applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound Level Meter NL-42 / NL-52</td>
<td>11-03</td>
<td>Manufacturer</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case corrections available</th>
<th>Uncertainties of case corrections</th>
<th>Source of case data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Manufacturer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wind screen corrections available</th>
<th>Uncertainties of wind screen corrections</th>
<th>Source of wind screen data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Manufacturer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mic pressure to free field corrections</th>
<th>Uncertainties of Mic to F.F. corrections</th>
<th>Source of Mic to F.F. corrections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>Yes</td>
<td>Manufacturer</td>
</tr>
</tbody>
</table>

| Total expanded uncertainties within the requirements of IEC 61672-1:2002 | Yes |

<table>
<thead>
<tr>
<th>Specified or equivalent Calibrator</th>
<th>Customer or Lab Calibrator</th>
<th>Calibrator adaptor type if applicable</th>
<th>Calibrator cal. date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specified</td>
<td>Customers Calibrator</td>
<td>NC-74-002</td>
<td>04 January 2019</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calibrator cert. number</th>
<th>Calibrator cal cert issued by</th>
<th>Calibrator SPL @ STP</th>
<th>Calibrator frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCRT19/1014</td>
<td>0653</td>
<td>94.00 dB</td>
<td>1001.96 Hz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Calibration reference sound pressure level</th>
<th>Calibration check frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>dB</td>
<td>Hz</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reference level range</th>
<th>Start</th>
<th>End</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 - 130 dB</td>
<td>23.61</td>
<td>23.46</td>
<td>± 0.40 °C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Environmental conditions during tests</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
</tr>
<tr>
<td>23.61</td>
</tr>
<tr>
<td>23.46</td>
</tr>
<tr>
<td>± 0.40 °C</td>
</tr>
</tbody>
</table>

Accessories used or corrected for during calibration - Wind Shield WS-10

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>23.61</td>
<td>23.46</td>
<td>± 0.40 °C</td>
</tr>
<tr>
<td>36.6</td>
<td>40.6</td>
<td>± 3.00 %RH</td>
</tr>
<tr>
<td>102.17</td>
<td>102.06</td>
<td>± 0.03 kPa</td>
</tr>
</tbody>
</table>

Response to associated Calibrator at the environmental conditions above.

<table>
<thead>
<tr>
<th>Initial indicated level</th>
<th>Adjusted indicated level</th>
</tr>
</thead>
<tbody>
<tr>
<td>94.3 dB</td>
<td>94.0 dB</td>
</tr>
</tbody>
</table>

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise - This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

<table>
<thead>
<tr>
<th>Weighting</th>
<th>A</th>
<th>C</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.6 dB</td>
<td>UR</td>
<td>16.2 dB</td>
<td>UR</td>
</tr>
</tbody>
</table>

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12, of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

Calibrated by: A Patel

Additional Comments

None
CERTIFICATE OF CALIBRATION

Date of Issue: 17 April 2018
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

Certificate Number: UCRT18/1415

Page 1 of 2 Pages

Approved Signatory

K. Mistry

Customer
WSP UK Limited
Kings Orchard
1 Queen St
Bristol
BS2 0HQ

Order No.
20066456

Description
Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification
Manufacturer | Instrument | Type | Serial No. / Version
Rion | Sound Level Meter | NL-52 | 00320638
Rion | Firmware | | 1.8
Rion | Pre Amplifier | NH-25 | 10646
Rion | Microphone | UC-59 | 03387
Rion | Calibrator | NC-74 | 34536109
Rion | Calibrator adaptor type if applicable | | NC-74-002

Performance Class
1

Test Procedure
TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002
YES
Approval Number
21.21 / 13.02

Date Received
16 April 2018

Date Calibrated
17 April 2018

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate

Dated
15 April 2016

Certificate No.
UCRT16/1132

Laboratory
7623

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

Certificate Number
UCRT18/1415

Page 2 of 2 Pages

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

<table>
<thead>
<tr>
<th>SLM instruction manual title</th>
<th>Sound Level Meter</th>
<th>NL-42 / NL-52</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLM instruction manual ref / issue</td>
<td>11-03</td>
<td></td>
</tr>
<tr>
<td>SLM instruction manual source</td>
<td>Manufacturer</td>
<td></td>
</tr>
<tr>
<td>Internet download date if applicable</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

Case corrections available | Yes |
Uncertainties of case corrections | Yes |
Source of case data | Manufacturer |

Wind screen corrections available | Yes |
Uncertainties of wind screen corrections | Yes |
Source of wind screen data | Manufacturer |

Mic pressure to free field corrections | Yes |
Uncertainties of Mic to F.F. corrections | Yes |
Source of Mic to F.F. corrections | Manufacturer |

Total expanded uncertainties within the requirements of IEC 61672-1:2002 | Yes |

Specified or equivalent Calibrator | Specified |
Customer or Lab Calibrator | Lab Calibrator |
Calibrator adaptor type if applicable | NC-74-002 |
Calibrator cal. date | 05 April 2018 |
Calibrator cert. number | UCRT18/1348 |
Calibrator cal cert issued by | 0653 |
Calibrator SPL @ STP | 93.98 dB |
Calibrator frequency | 1001.90 Hz |
Reference level range | 25 - 130 dB |

Accessories used or corrected for during calibration - Wind Shield WS-10
Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests

<table>
<thead>
<tr>
<th>Condition</th>
<th>Start</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>22.51</td>
<td>22.85</td>
</tr>
<tr>
<td>Humidity</td>
<td>42.7</td>
<td>41.2</td>
</tr>
<tr>
<td>Ambient Pressure</td>
<td>100.68</td>
<td>100.72</td>
</tr>
</tbody>
</table>

Response to associated Calibrator at the environmental conditions above.

<table>
<thead>
<tr>
<th>Initial indicated level</th>
<th>94.1 dB</th>
<th>Adjusted indicated level</th>
<th>94.0 dB</th>
</tr>
</thead>
</table>

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise

<table>
<thead>
<tr>
<th>Noise</th>
<th>This test is currently not performed by this Lab.</th>
</tr>
</thead>
</table>

Microphone installed (if requested by customer) = Less Than N/A dB A Weighting

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

<table>
<thead>
<tr>
<th>Weighting</th>
<th>A</th>
<th>C</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13.3 dB</td>
<td>UR</td>
<td>17.9 dB</td>
</tr>
</tbody>
</table>

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

END

Calibrated by: A Patel

Additional Comments
None
Date of Issue: 17 June 2019

Certificate Number: UCRT19/1696

Customer: WSP UK Limited
Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Order No.: 20093915
Description: Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Instrument</th>
<th>Type</th>
<th>Serial No. / Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rion</td>
<td>Sound Level Meter</td>
<td>NL-52</td>
<td>01021290</td>
</tr>
<tr>
<td>Rion</td>
<td>Firmware</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td>Rion</td>
<td>Pre Amplifier</td>
<td>NH-25</td>
<td>21332</td>
</tr>
<tr>
<td>Rion</td>
<td>Microphone</td>
<td>UC-59</td>
<td>04346</td>
</tr>
<tr>
<td>Rion</td>
<td>Calibrator</td>
<td>NC-74</td>
<td>01020510</td>
</tr>
<tr>
<td></td>
<td>Calibrator adaptor type if applicable</td>
<td>NC-74-002</td>
<td></td>
</tr>
</tbody>
</table>

Performance Class: 1
Test Procedure: TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002: YES
Approval Number: 21.21 / 13.02
If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received: 14 June 2019
Date Calibrated: 17 June 2019

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate: Dated 14 June 2017
Certificate No.: UCRT17/1490
Laboratory: 0653

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

<table>
<thead>
<tr>
<th>SLM instruction manual title</th>
<th>Sound Level Meter NL-42 / NL-52</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLM instruction manual ref / issue</td>
<td>11-03</td>
</tr>
<tr>
<td>SLM instruction manual source</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Internet download date if applicable</td>
<td>N/A</td>
</tr>
<tr>
<td>Case corrections available</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of case corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of case data</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Wind screen corrections available</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of wind screen corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of wind screen data</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Mic pressure to free field corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of Mic to F.F. corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of Mic to F.F. corrections</td>
<td>Manufacturer</td>
</tr>
</tbody>
</table>

Total expanded uncertainties within the requirements of IEC 61672-1:2002: Yes

Specified or equivalent Calibrator: Specified
Customer or Lab Calibrator: Customers Calibrator
Calibrator adaptor type if applicable: NC-74-002
Calibrator cal. date: 17 June 2019
Calibrator cert. number: UCRT19/1695
Calibrator cal cert issued by: 0653
Calibrator SPL @ STP: 94.01 dB (Calibration reference sound pressure level)
Calibrator frequency: 1001.13 Hz (Calibration check frequency)
Reference level range: 25 - 130 dB

Accessories used or corrected for during calibration - Wind Shield WS-10

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests:

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp</td>
<td>22.32</td>
<td>23.21</td>
</tr>
<tr>
<td>Humid</td>
<td>49.0</td>
<td>48.9</td>
</tr>
<tr>
<td>Press</td>
<td>100.69</td>
<td>100.68</td>
</tr>
</tbody>
</table>

Response to associated Calibrator at the environmental conditions above:

<table>
<thead>
<tr>
<th>Initial indicated level</th>
<th>Adjusted indicated level</th>
</tr>
</thead>
<tbody>
<tr>
<td>94.1 dB</td>
<td>94.0 dB</td>
</tr>
</tbody>
</table>

The uncertainty of the associated calibrator supplied with the sound level meter ± 0.10 dB

Self Generated Noise: This test is currently not performed by this Lab.

Microphone installed (if requested by customer) = Less Than N/A dB A Weighing

Uncertainty of the microphone installed self generated noise ± N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

<table>
<thead>
<tr>
<th>Weighting</th>
<th>A</th>
<th>C</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.8 dB</td>
<td>UR</td>
<td>16.5 dB</td>
<td>UR</td>
</tr>
</tbody>
</table>

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12. of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

Calibrated by: A Patel
Additional Comments
None
CERTIFICATE OF CALIBRATION

Date of Issue: 07 January 2019
Certificate Number: UCRT19/1022

Customer: WSP UK Ltd
3rd Floor, Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Order No.: 20084040
Description: Sound Level Meter / Pre-amp / Microphone / Associated Calibrator

Identification

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Instrument</th>
<th>Type</th>
<th>Serial No. / Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rion</td>
<td>Sound Level Meter</td>
<td>NL-52</td>
<td>01021289</td>
</tr>
<tr>
<td>Rion</td>
<td>Firmware</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Rion</td>
<td>Pre Amplifier</td>
<td>NH-25</td>
<td>21331</td>
</tr>
<tr>
<td>Rion</td>
<td>Microphone</td>
<td>UC-59</td>
<td>04345</td>
</tr>
<tr>
<td>Rion</td>
<td>Calibrator</td>
<td>NC-74</td>
<td>00830766</td>
</tr>
<tr>
<td></td>
<td>Calibrator adaptor type if applicable</td>
<td>NC-74-002</td>
<td></td>
</tr>
</tbody>
</table>

Performance Class: 1
Test Procedure: TP 2.SLM 61672-3 TPS-49
Procedures from IEC 61672-3:2006 were used to perform the periodic tests.

Type Approved to IEC 61672-1:2002: YES
Approval Number: 21.21 / 13.02

If YES above there is public evidence that the SLM has successfully completed the applicable pattern evaluation tests of IEC 61672-2:2003

Date Received: 03 January 2019
ANV Job No.: UKAS19/01011
Date Calibrated: 07 January 2019

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2006, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2003, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2002.

Previous Certificate

<table>
<thead>
<tr>
<th>Dated</th>
<th>Certificate No.</th>
<th>Laboratory</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 January 2017</td>
<td>UCRT17/1012</td>
<td>7623</td>
</tr>
</tbody>
</table>

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

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

<table>
<thead>
<tr>
<th>SLM instruction manual title</th>
<th>Sound Level Meter NL-42 / NL-52</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLM instruction manual ref / issue</td>
<td>11-03</td>
</tr>
<tr>
<td>SLM instruction manual source</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Internet download date if applicable</td>
<td>N/A</td>
</tr>
<tr>
<td>Case corrections available</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of case corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of case data</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Wind screen corrections available</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of wind screen corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of wind screen data</td>
<td>Manufacturer</td>
</tr>
<tr>
<td>Mic pressure to free field corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Uncertainties of Mic to F.F. corrections</td>
<td>Yes</td>
</tr>
<tr>
<td>Source of Mic to F.F. corrections</td>
<td>Manufacturer</td>
</tr>
</tbody>
</table>

Total expanded uncertainties within the requirements of IEC 61672-1:2002: Yes

<table>
<thead>
<tr>
<th>Specified or equivalent Calibrator</th>
<th>Specified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer or Lab Calibrator</td>
<td>Customers Calibrator</td>
</tr>
<tr>
<td>Calibrator adaptor type if applicable</td>
<td>NC-74-002</td>
</tr>
<tr>
<td>Calibrator cal. date</td>
<td>04 January 2019</td>
</tr>
<tr>
<td>Calibrator cert. number</td>
<td>UCRT19/1013</td>
</tr>
<tr>
<td>Calibrator cal cert issued by</td>
<td>0653</td>
</tr>
<tr>
<td>Calibrator SPL @ STP</td>
<td>93.99 dB</td>
</tr>
<tr>
<td>Calibration reference sound pressure level</td>
<td>Calibration check frequency</td>
</tr>
<tr>
<td>Reference level range</td>
<td>25 - 130 dB</td>
</tr>
</tbody>
</table>

Accessories used or corrected for during calibration: Wind Shield WS-10

Note - if a pre-amp extension cable is listed then it was used between the SLM and the pre-amp.

Environmental conditions during tests

<table>
<thead>
<tr>
<th>Start</th>
<th>End</th>
<th>±</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>23.21</td>
<td>23.50</td>
</tr>
<tr>
<td>Humidity</td>
<td>34.2</td>
<td>36.6</td>
</tr>
<tr>
<td>Ambient Pressure</td>
<td>102.21</td>
<td>102.19</td>
</tr>
</tbody>
</table>

Response to associated Calibrator at the environmental conditions above.

<table>
<thead>
<tr>
<th>Initial indicated level</th>
<th>94.1 dB</th>
<th>Adjusted indicated level</th>
<th>94.0 dB</th>
</tr>
</thead>
</table>

Self Generated Noise
This test is currently not performed by this Lab.

<table>
<thead>
<tr>
<th>Microphone installed (if requested by customer)</th>
<th>Less Than</th>
<th>N/A dB</th>
<th>A Weighting</th>
</tr>
</thead>
</table>

Uncertainty of the microphone installed self generated noise ±  N/A dB

Microphone replaced with electrical input device - UR = Under Range indicated

<table>
<thead>
<tr>
<th>Weighting</th>
<th>A</th>
<th>C</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.5 dB</td>
<td>UR</td>
<td>16.3 dB</td>
<td>UR</td>
</tr>
</tbody>
</table>

Uncertainty of the electrical self generated noise ± 0.12 dB

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.

For the test of the frequency weightings as per paragraph 12 of IEC 61672-3:2006 the actual microphone free field response was used.

The acoustical frequency tests of a frequency weighting as per paragraph 11 of IEC 61672-3:2006 were carried out using an electrostatic actuator.

Calibrated by: A Patel

Additional Comments
None

END

R 1
Date of Issue: 25 June 2019

Certificate Number: UCRT19/1719

Customer: WSP UK Limited
Kings Orchard
1 Queen Street
Bristol
BS2 0HQ

Order No.: 20094502

Test Procedure: Procedure TP 1 Calibration of Sound Calibrators

Description: Acoustic Calibrator

Identification: Manufacturer: Rion
Instrument: Calibrator,
Model: NC-74
Serial No.: 35173440

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.

ANV Job No.: UKAS19/06416
Date Received: 24 June 2019
Date Calibrated: 25 June 2019
Previous Certificate: Dated 13 June 2018
Certificate No.: UCRT18/1610
Laboratory: 0653

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CERTIFICATE OF CALIBRATION

UKAS Accredited Calibration Laboratory No. 0653

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  Manufacturer  Type
Brüel & Kjæer  4134

Results

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

\[ 93.97 \pm 0.10 \text{ dB rel 20 } \mu \text{Pa} \]

Functional Tests and Observations

The frequency of the sound produced was 1002.84 Hz \( \pm \) 0.13 Hz
The total distortion was 1.22 % \( \pm \) 6.7 % of Reading

During the measurements environmental conditions were

Temperature  23 to 24 \( ^\circ \)C
Relative Humidity  51 to 58 %
Barometric Pressure  100.7 to 100.8 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 manufacturer's handbook for details.

Note:

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

Additional Comments
None

Calibrated by:  B. Bogdan