Document 6.2

ES - Vol 2 Technical Appendix 13A.3 Addendum Noise - Full Survey Results 1 of 3 Regulation 5(2)(a)

The West Midlands Rail Freight Interchange Order 201X

Resound: April 2019

Four Ashes Limited

West Midlands Interchange

Four Ashes Ltd

Technical Appendix 13A.3: Full Survey Results

Table A13A.3.1: Noise monitoring equipment June/July 2018 survey

Position	Model	Serial Number	Calibration Certificate Issue Date
N1	01dB Duo Type 1 sound level meter	12373	17/03/2017
	01dB PRE22N pre-amplifier	1610405	
	GRAS 40CD microphone	287751	
N2	01dB Duo Type 1 sound level meter	10515	03/05/2018
	01dB PRE22N pre-amplifier	10126	
	GRAS 40CD microphone	136819	
N4	01dB Cube Type 1 sound level meter	10692	12/04/2017
	01dB PRE22N pre-amplifier	10755	
	GRAS 40CD microphone	224253	
N5	01dB Cube Type 1 sound level meter	10414	18/07/2017
	01dB PRE22N pre-amplifier	10644	
	GRAS 40CD microphone	144941	
N6	01dB Fusion Type 1 sound level meter	11403	12/06/2017
	01dB PRE22N pre-amplifier	1610351	
	GRAS 40CD microphone	259481	
N7	01dB Cube Type 1 sound level meter	11118	18/12/2017
	01dB PRE22N pre-amplifier	1610458	
	GRAS 40CD microphone	260866	
N8	01dB Cube Type 1 sound level meter	11165	16/05/2017
	01dB PRE22N pre-amplifier	161406	
	GRAS 40CD microphone	287995	
N9	01dB Cube Type 1 sound level meter	11110	19/12/2017
	01dB PRE22N pre-amplifier	1610541	
	GRAS 40CD microphone	260893	
N10	01dB Duo Type 1 sound level meter	10522	15/03/2018
	01dB PRE22N pre-amplifier	10329	
	GRAS 40CD microphone	154578	
N11	01dB Cube Type 1 sound level meter	10694	03/05/2017
	01dB PRE22N pre-amplifier	11118	
	GRAS 40CD microphone	224223	
N12	01dB Cube Type 1 sound level meter	10619	27/03/2017
	01dB PRE22N pre-amplifier	10730	
	GRAS 40CD microphone	207246	
N1,N2,N4,N6,N7,N8,N12	01dB Cal21 calibrator	35054818	20/04/2018
N5,N9,N10,N11	01dB Cal21 calibrator	34134139	03/05/2018

Figure A13A.3.1: Full survey results, Position N1

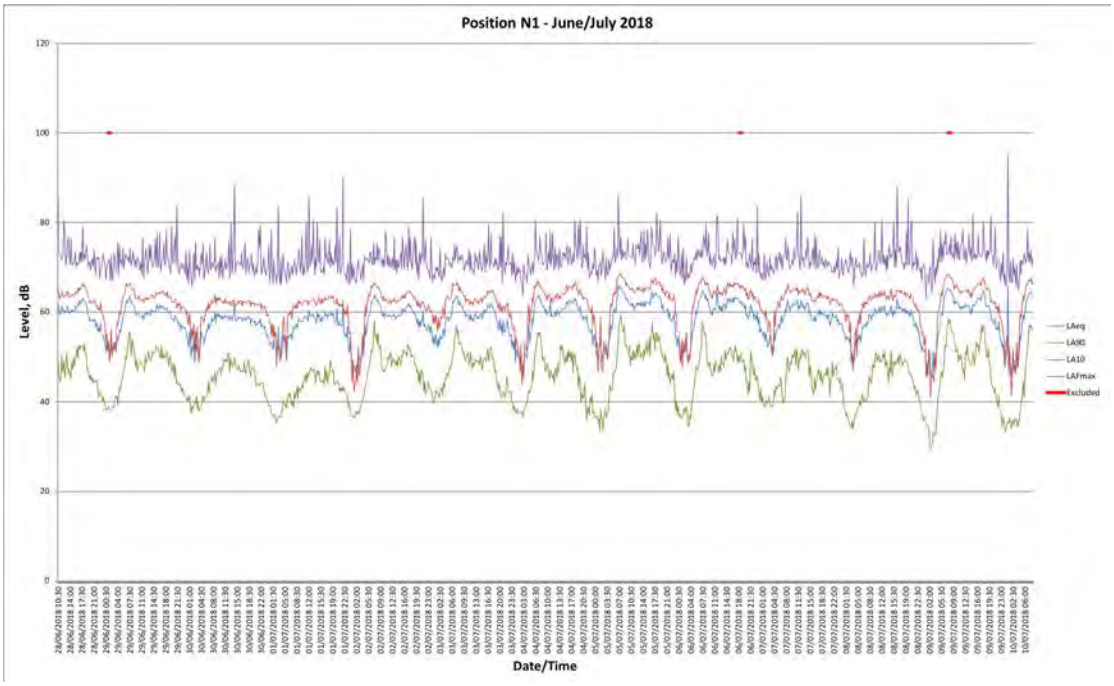


Figure A13A.3.2: Full survey results, Position N2

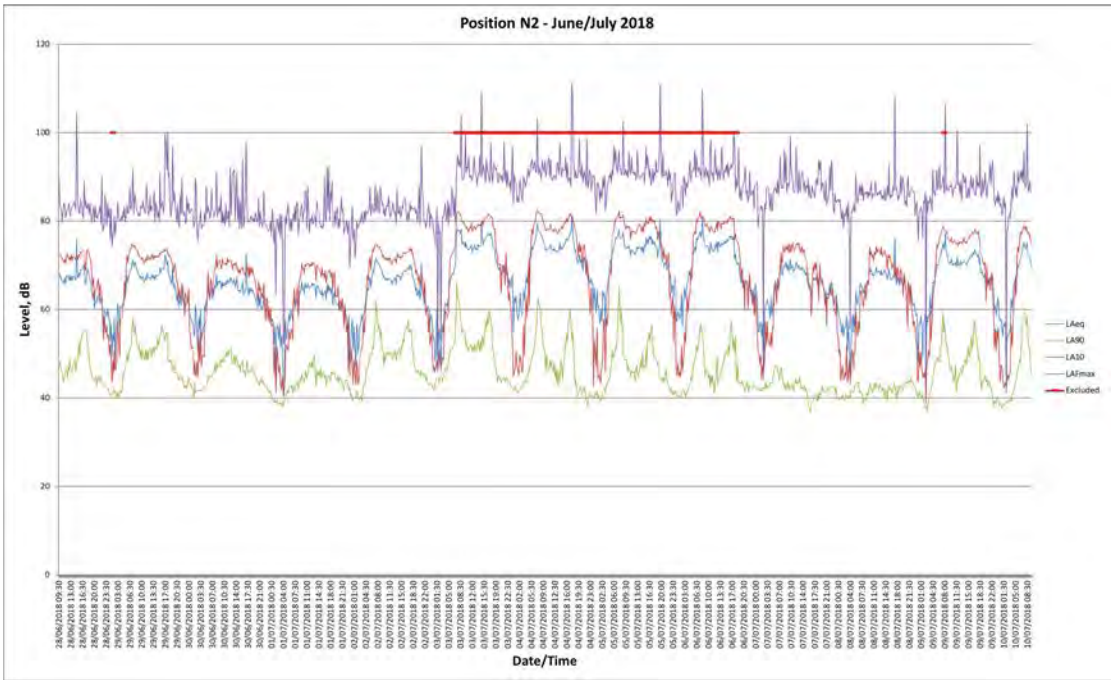


Figure A13A.3.3: Full survey results, Position N4

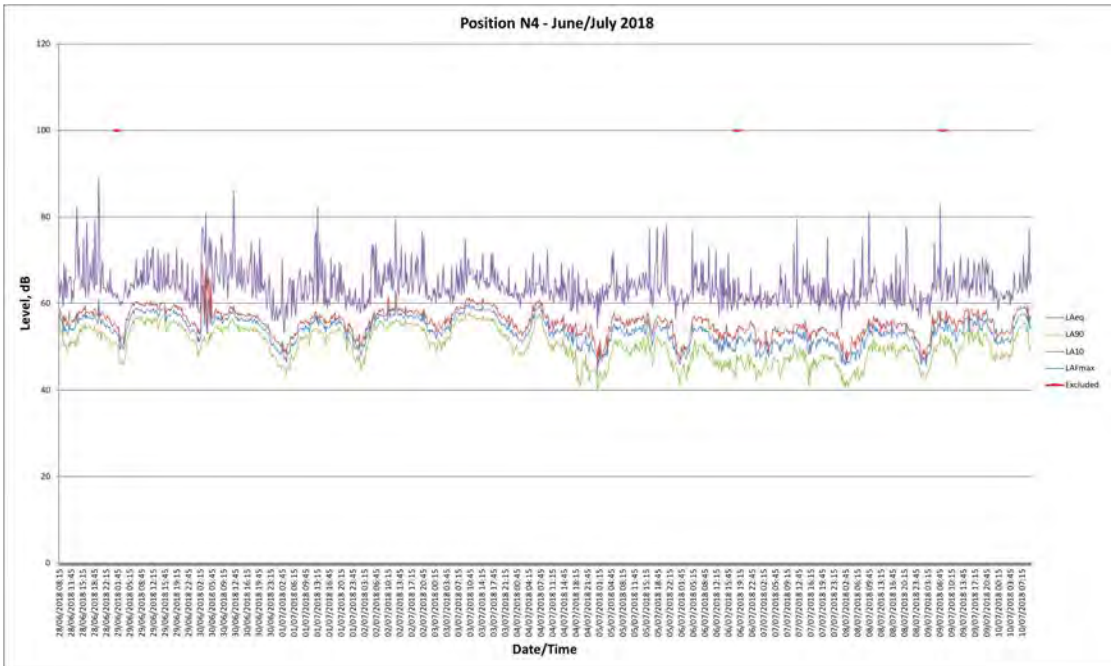


Figure A13A.3.4: Full survey results, Position N5

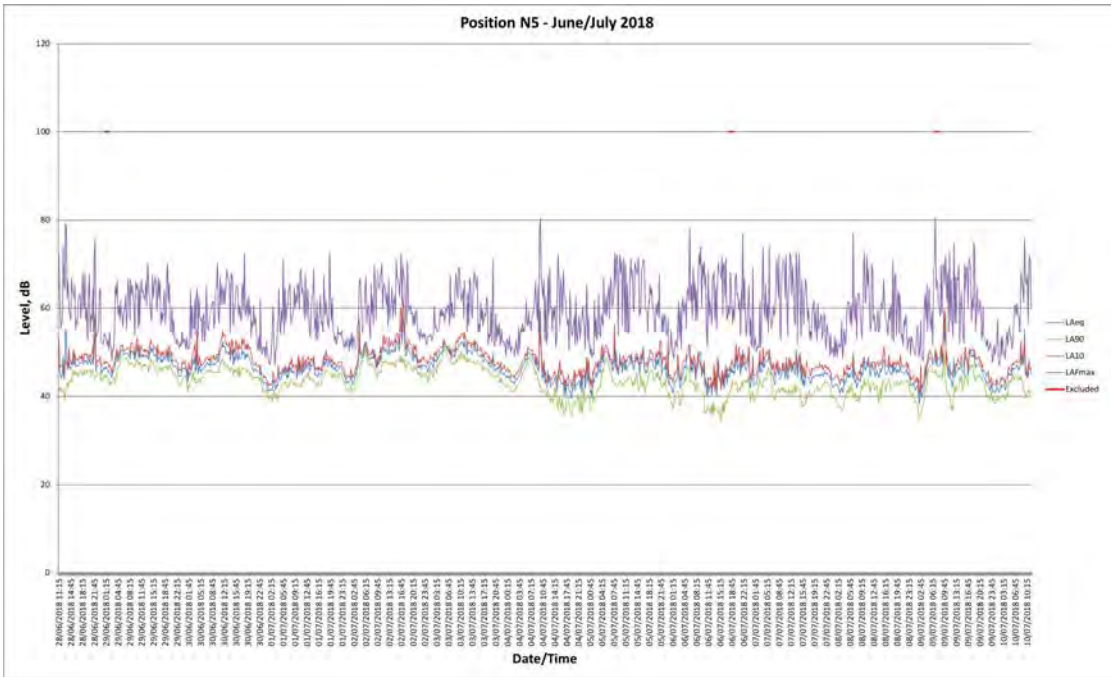


Figure A13A.3.5: Full survey results, Position N6

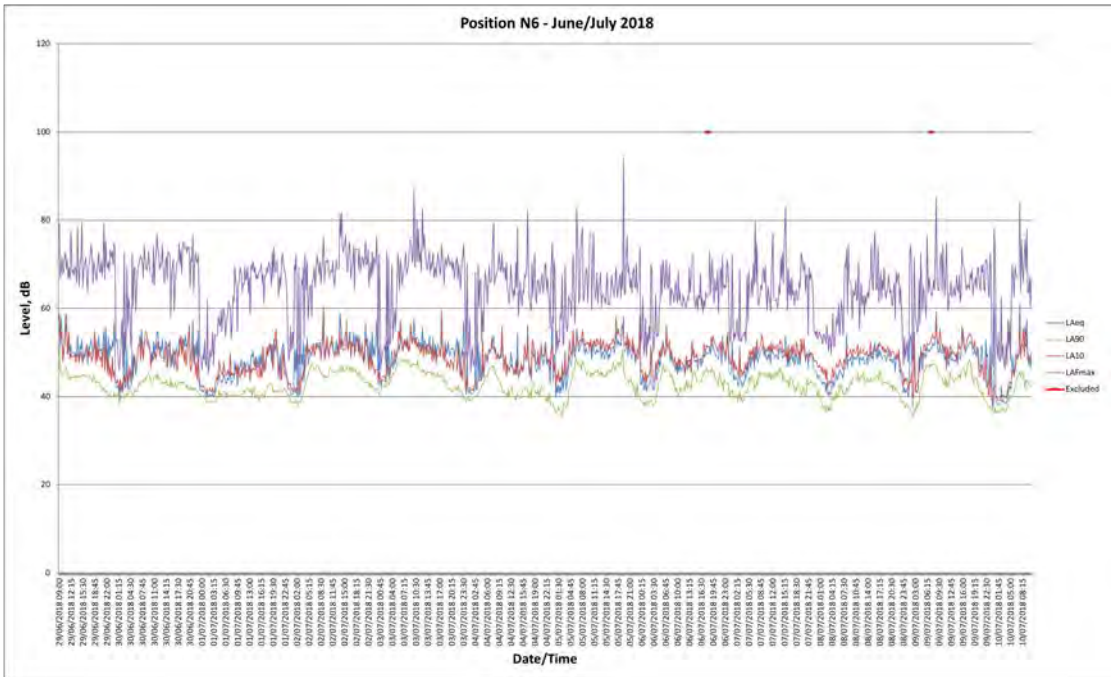


Figure A13A.3.6: Full survey results, Position N7

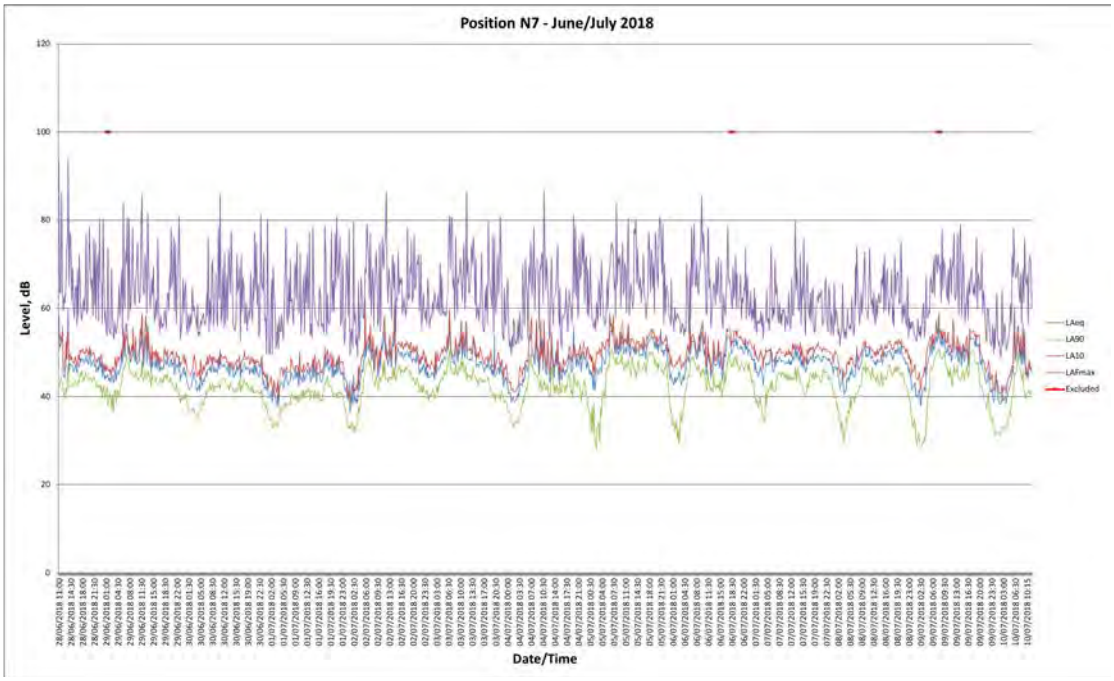


Figure A13A.3.7: Full survey results, Position N8

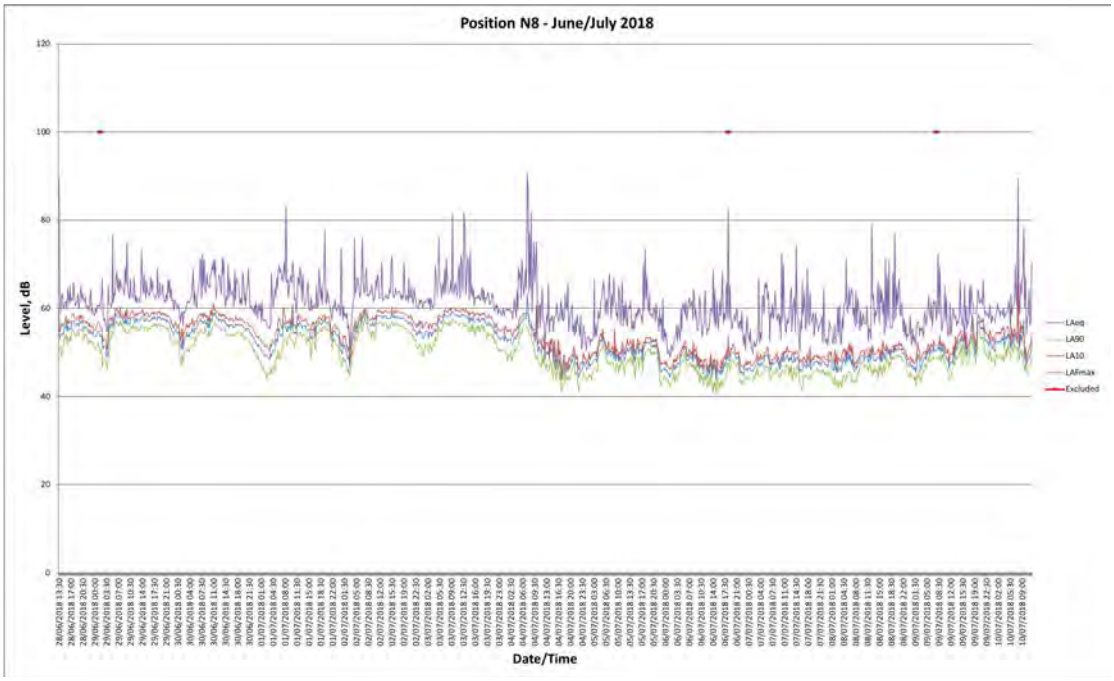


Figure A13A.3.8: Full survey results, Position N9

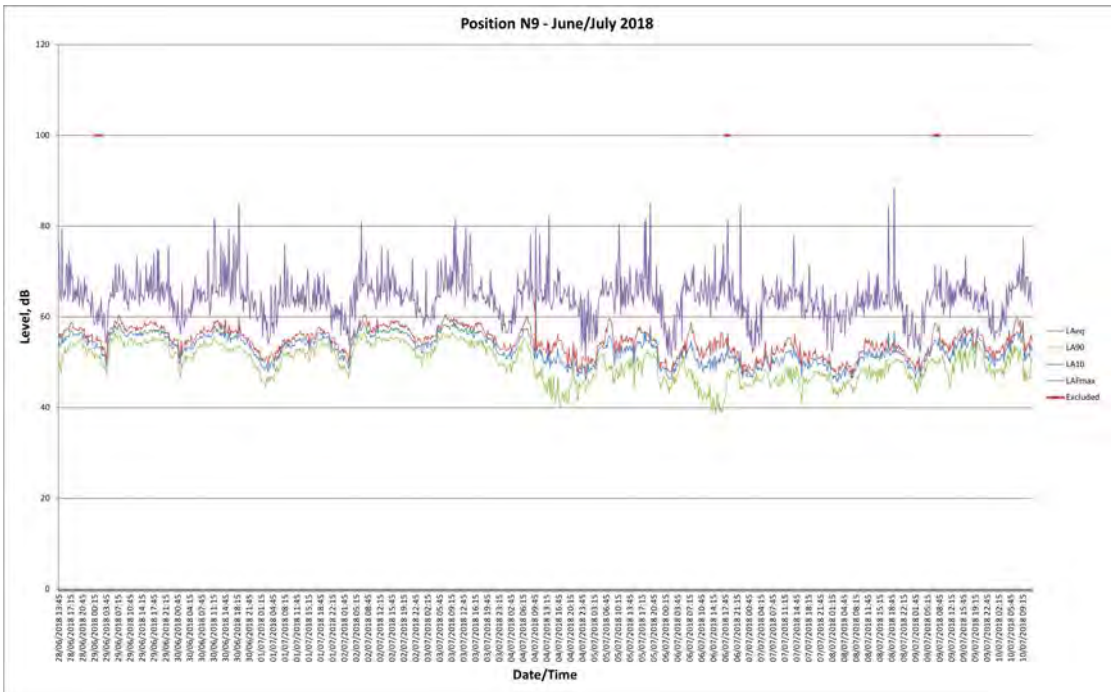


Figure A13A.3.9: Full survey results, Position N10

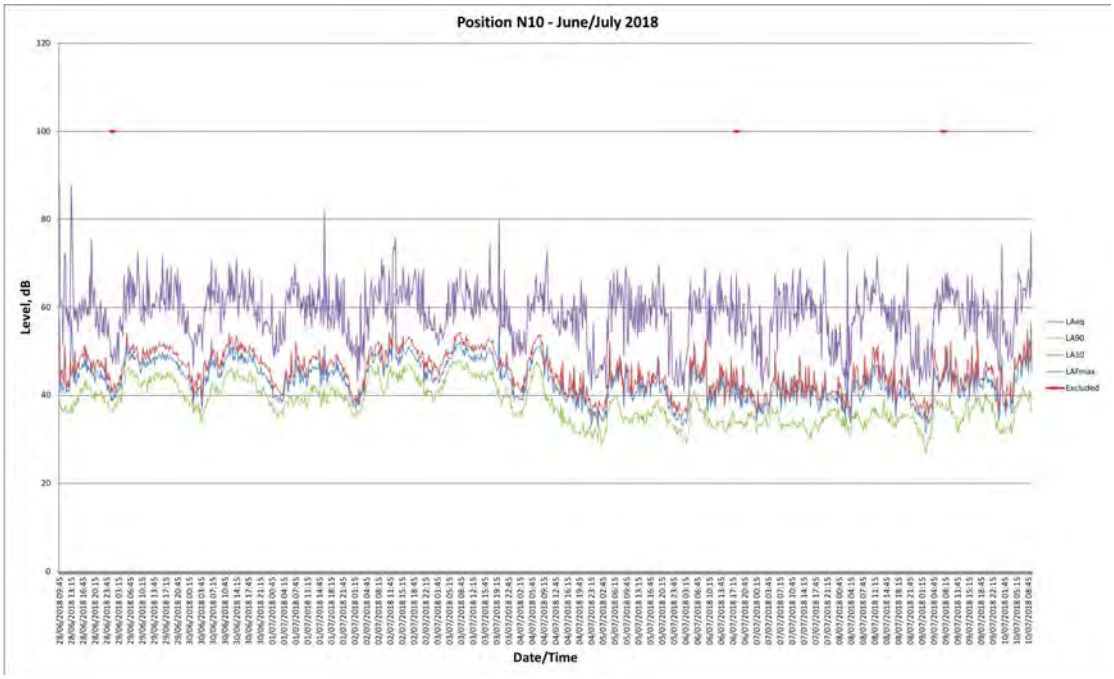


Figure A13A.3.10: Full survey results, Position N11

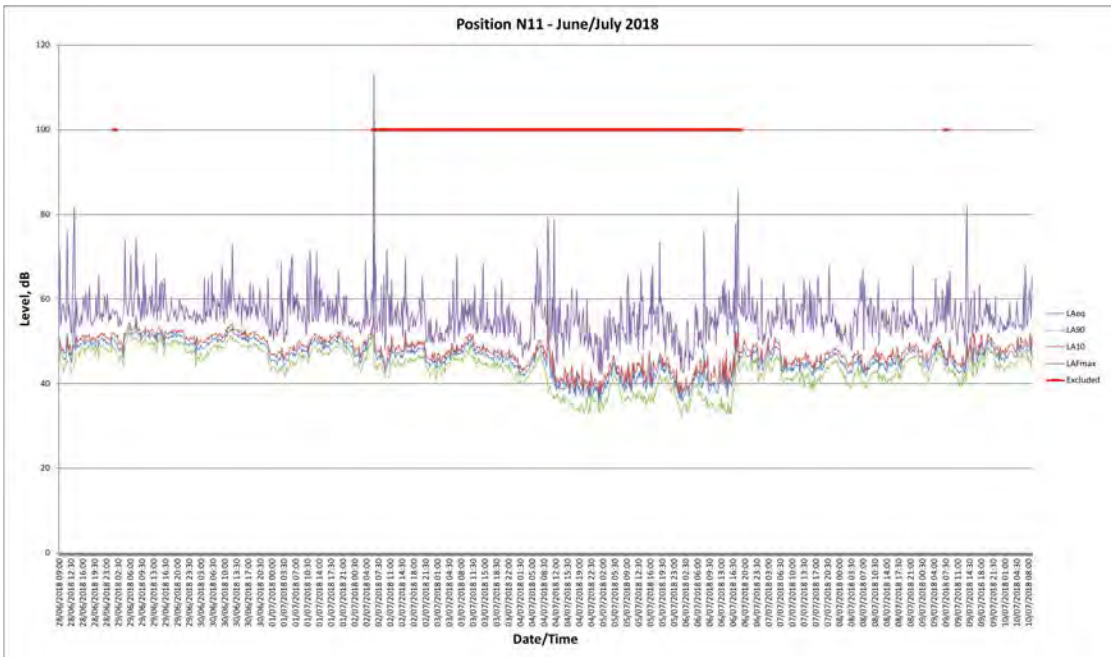


Figure A13A.3.11: Full survey results, Position N12

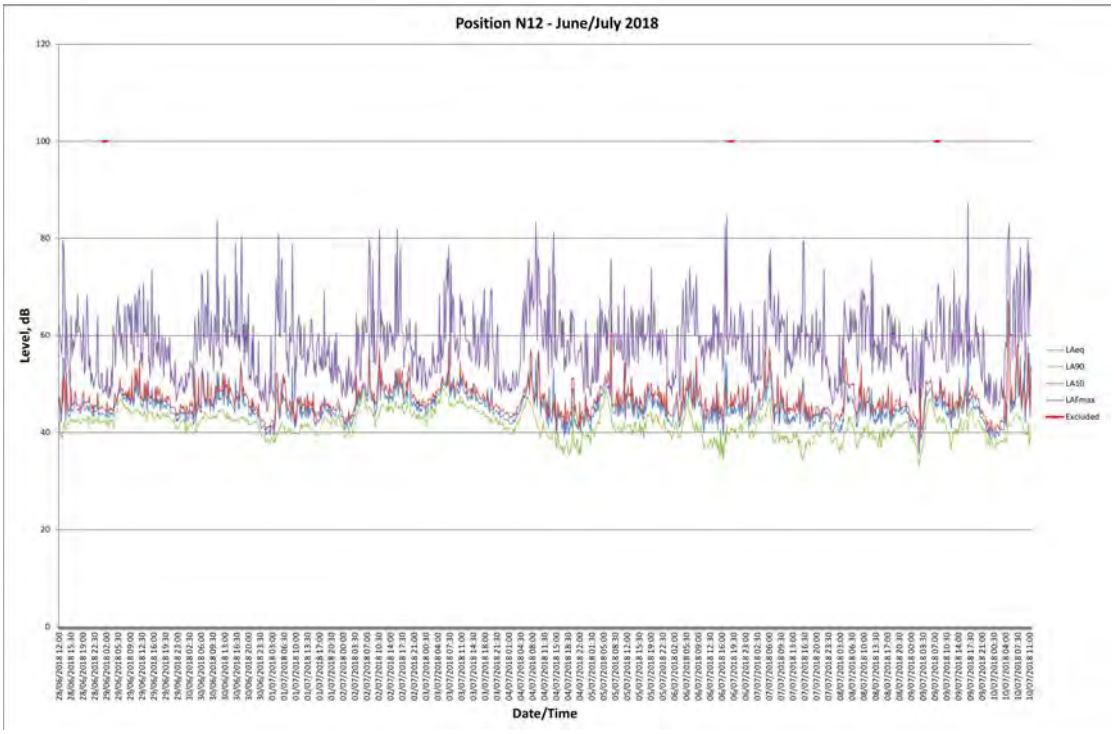


Figure A13A.3.12: L_{A90} distribution, daytime, Position N1

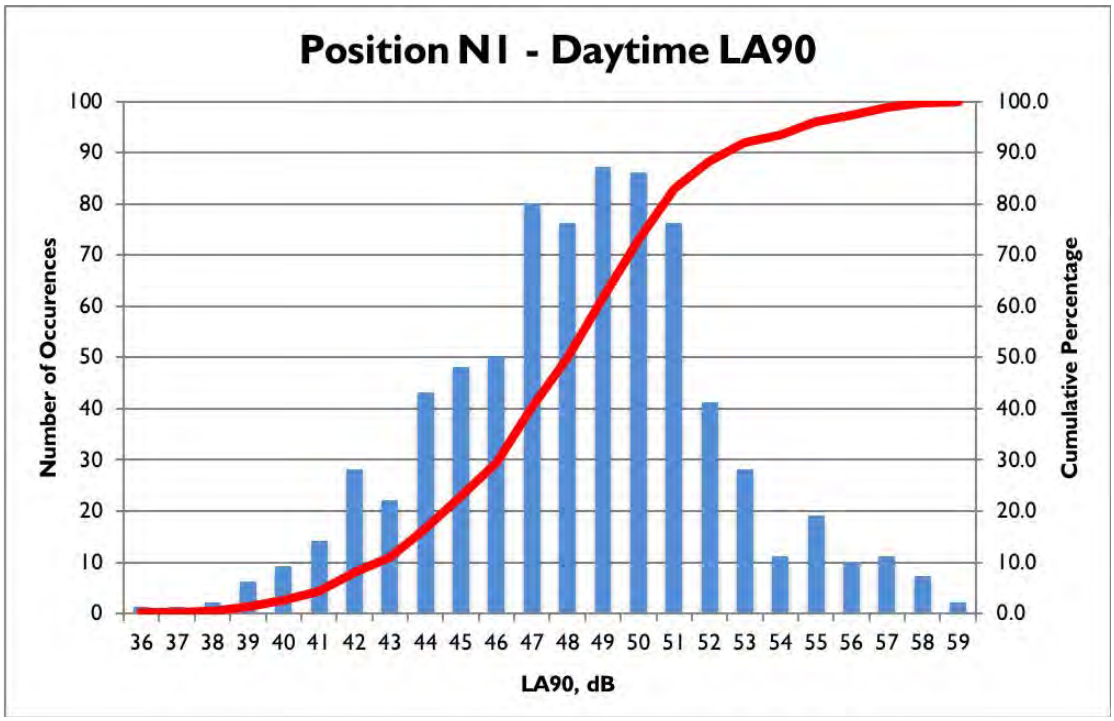


Figure A13A.3.13: L_{A90} distribution, night-time, Position N1

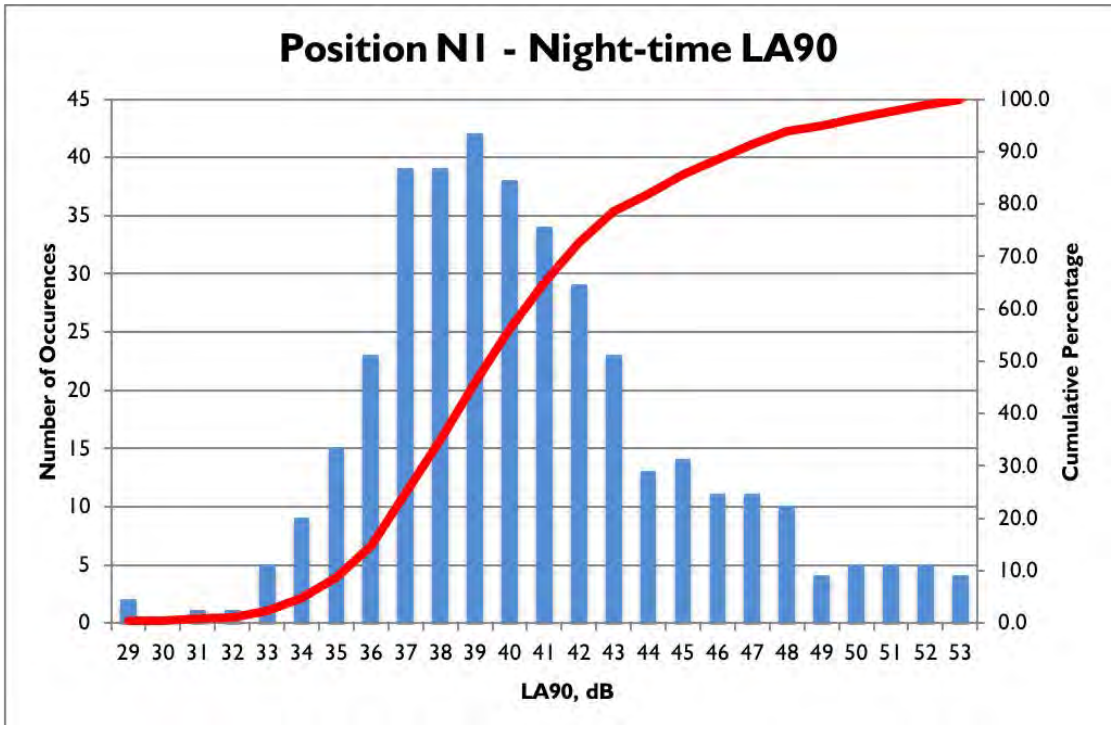


Figure A13A.3.14: L_{A90} distribution, daytime, Position N2

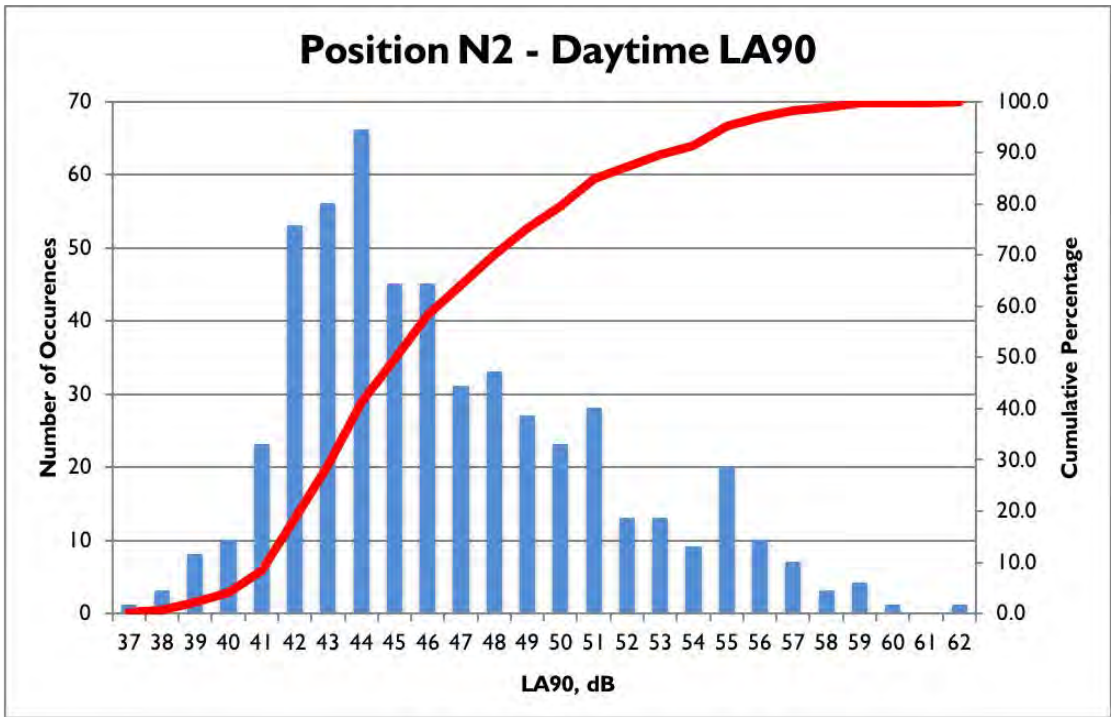


Figure A13A.3.15: L_{A90} distribution, night-time, Position N2

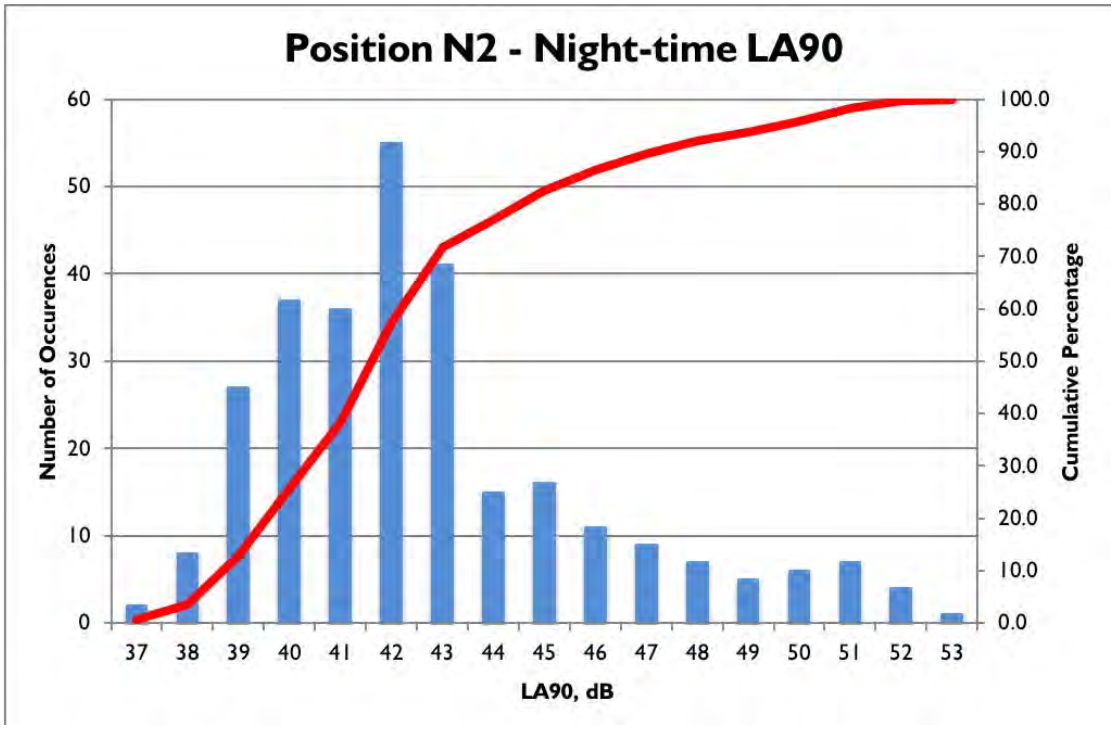


Figure A13A.3.16: L_{A90} distribution, daytime, Position N4

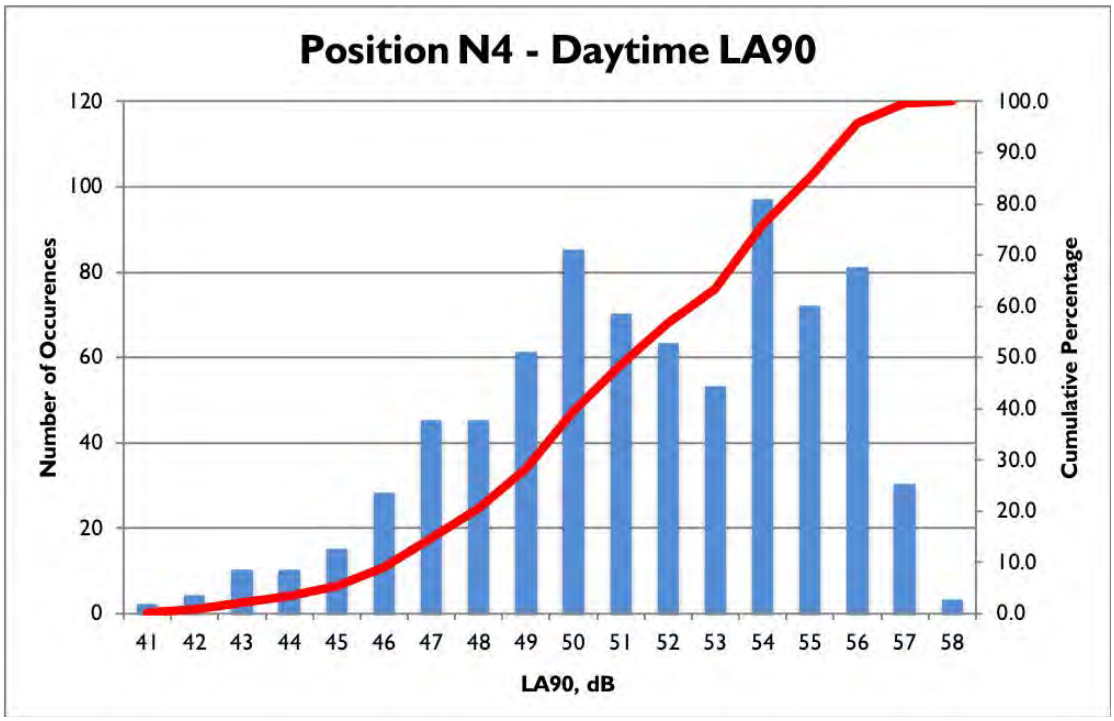


Figure A13A.3.17: L_{A90} distribution, night-time, Position N4

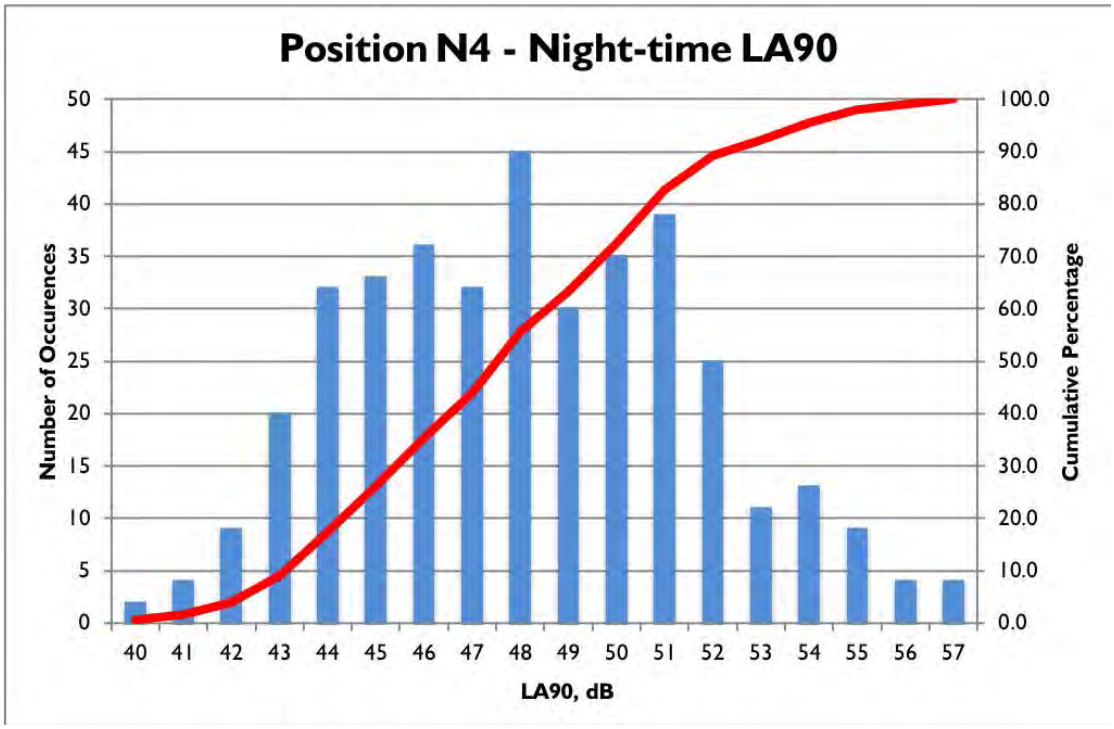


Figure A13A.3.18: L_{A90} distribution, daytime, Position N5

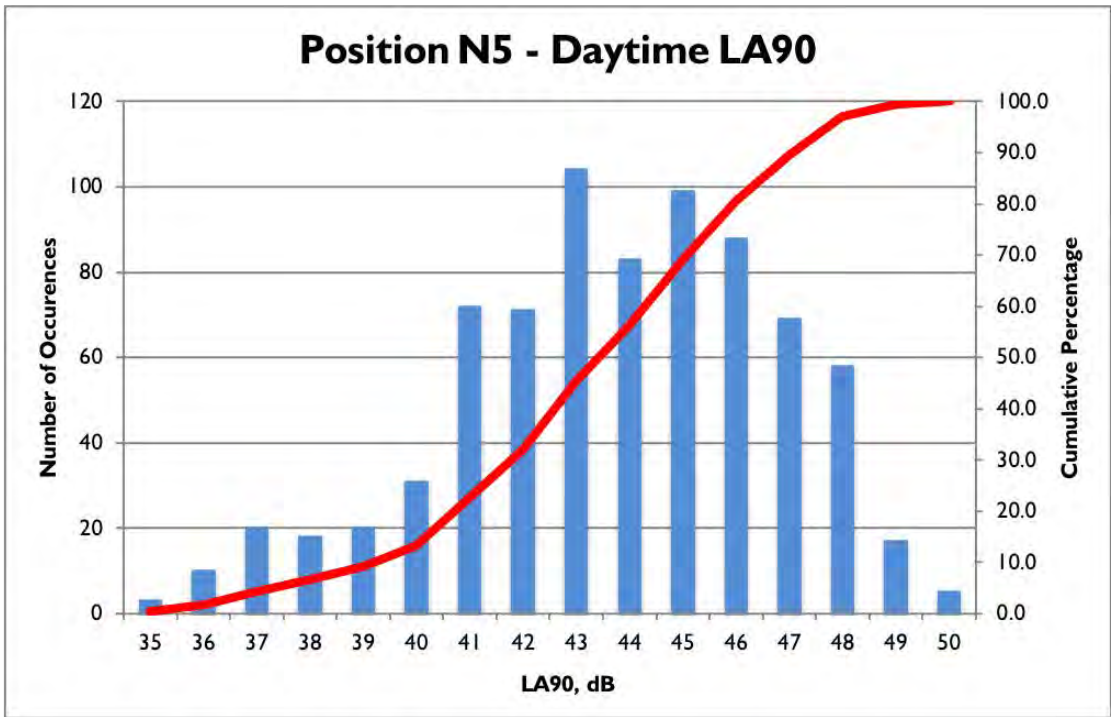


Figure A13A.3.19: L_{A90} distribution, night-time, Position N5

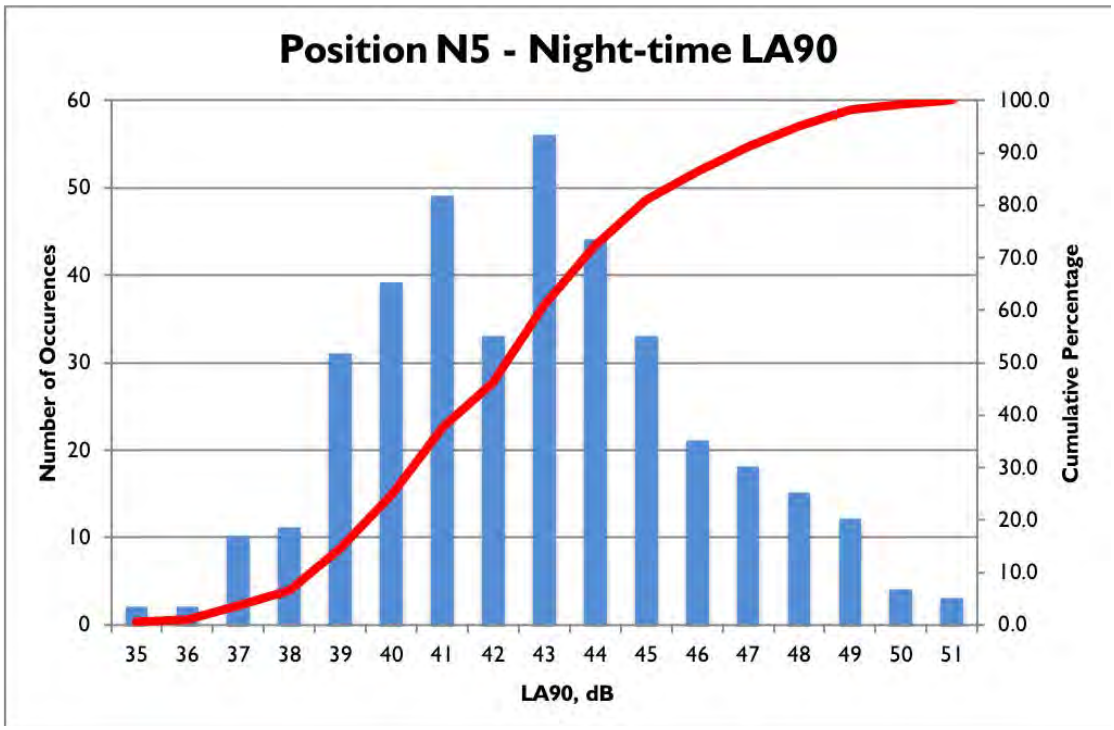


Figure A13A.3.20: L_{A90} distribution, daytime, Position N6

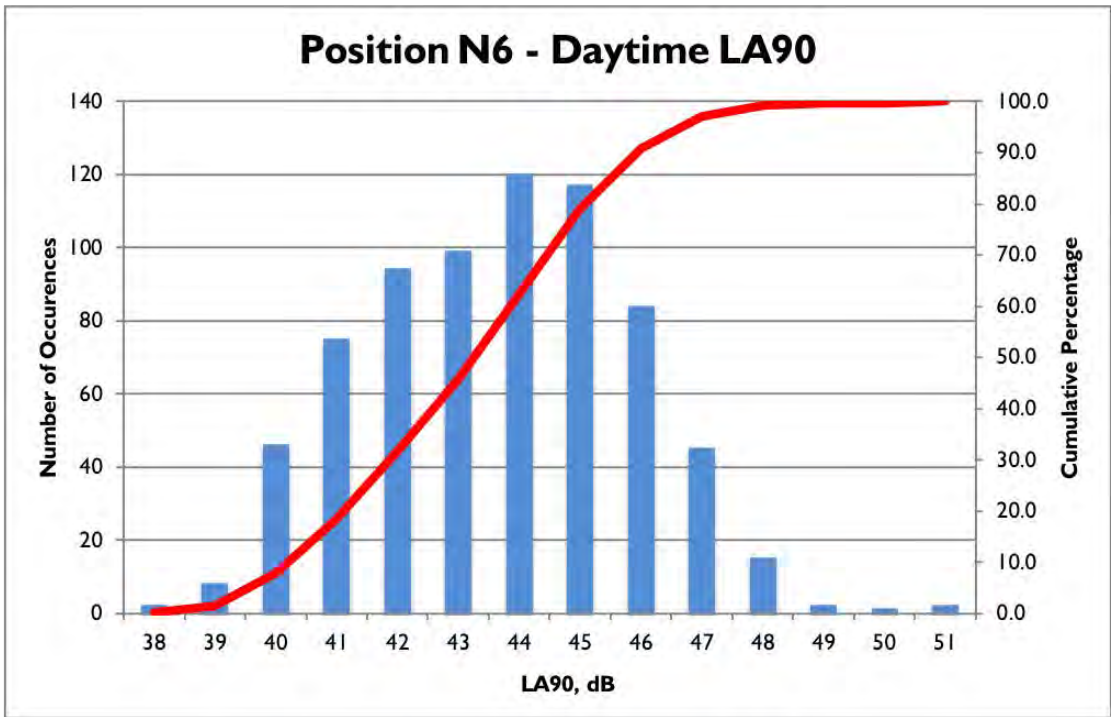


Figure A13A.3.21: L_{A90} distribution, night-time, Position N6

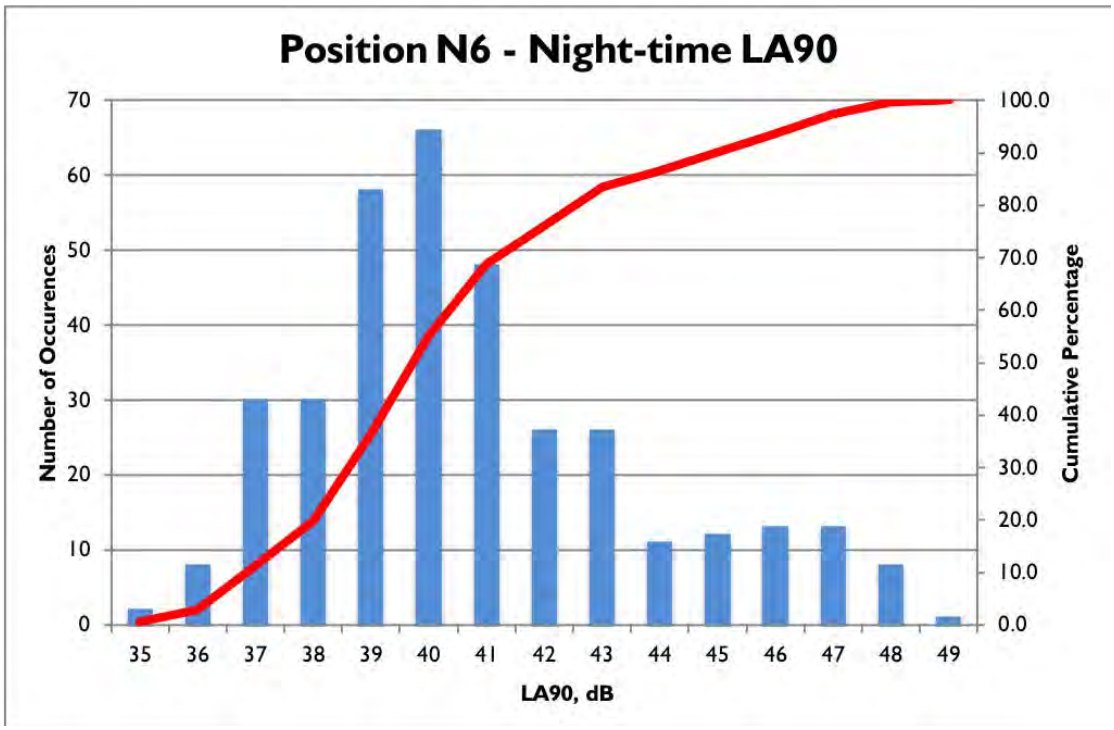


Figure A13A.3.22: L_{A90} distribution, daytime, Position N7

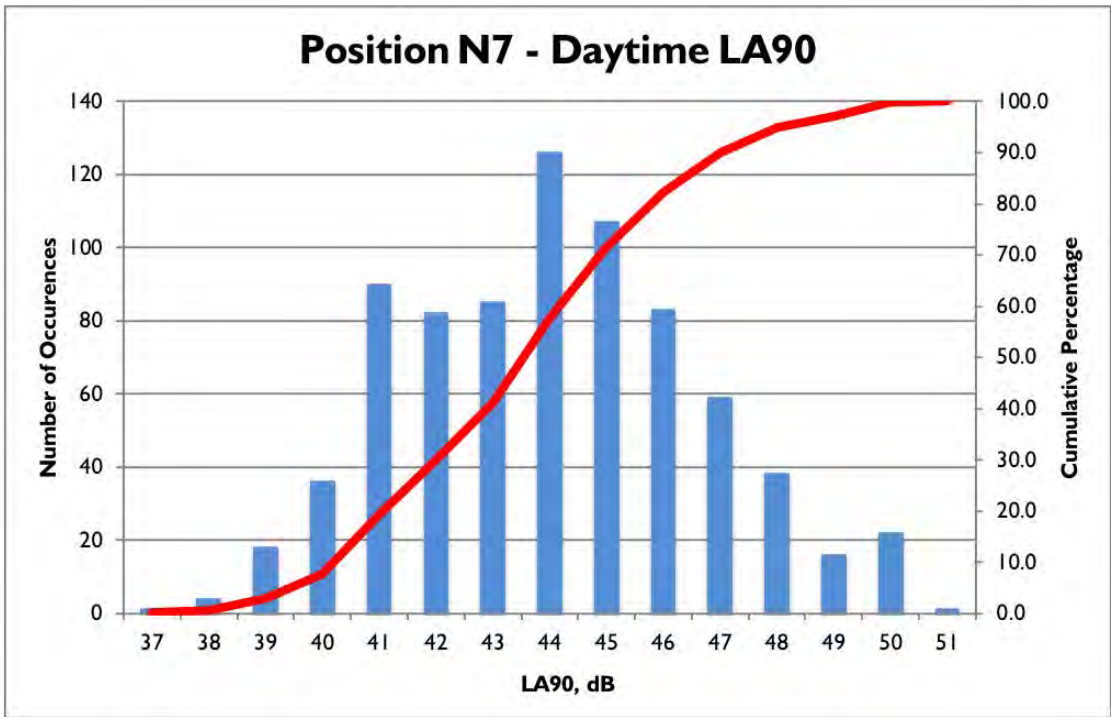


Figure A13A.3.23: L_{A90} distribution, night-time, Position N7

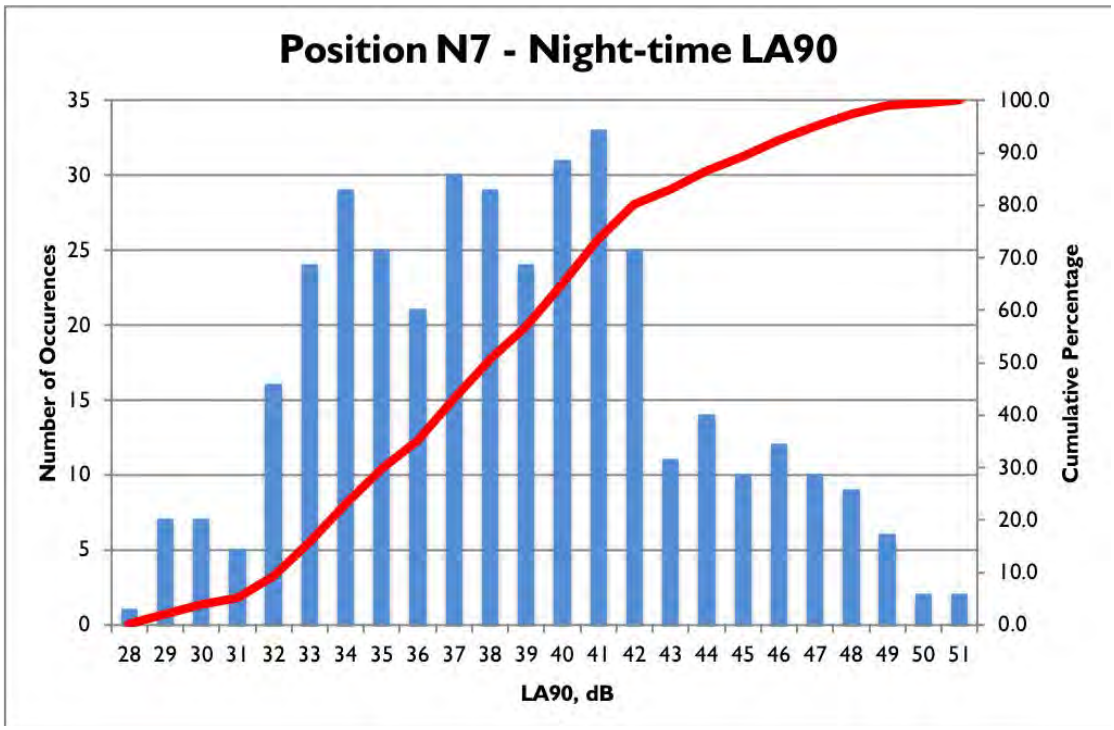


Figure A13A.3.24: L_{A90} distribution, daytime, Position N8

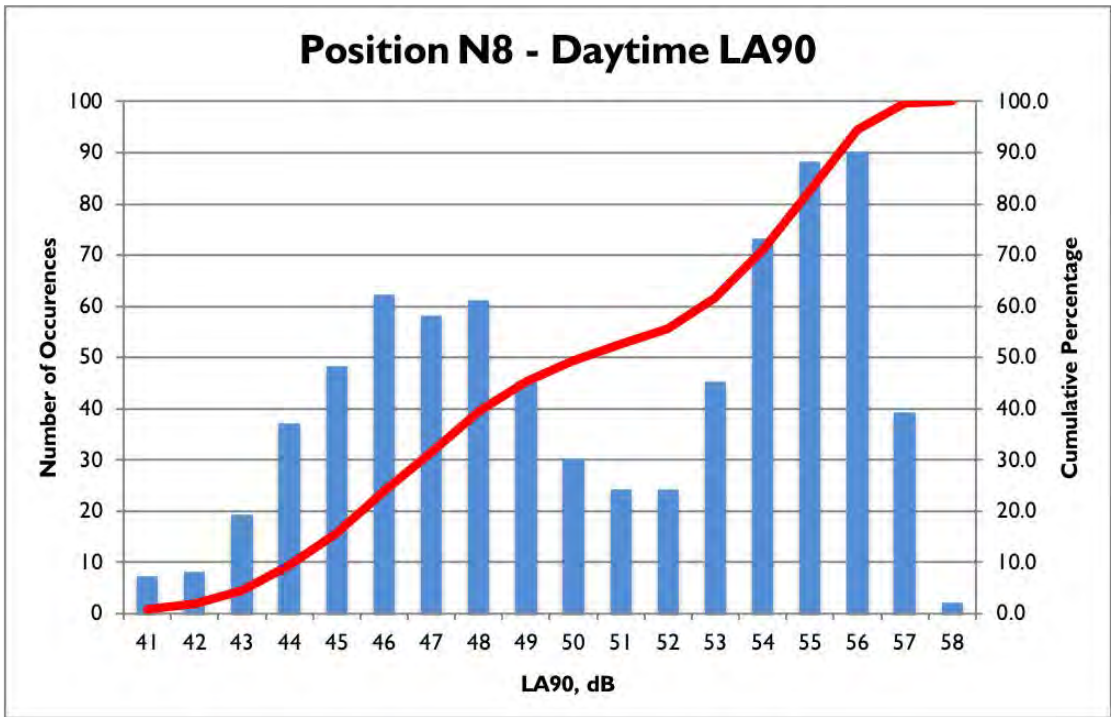


Figure A13A.3.25: L_{A90} distribution, night-time, Position N8

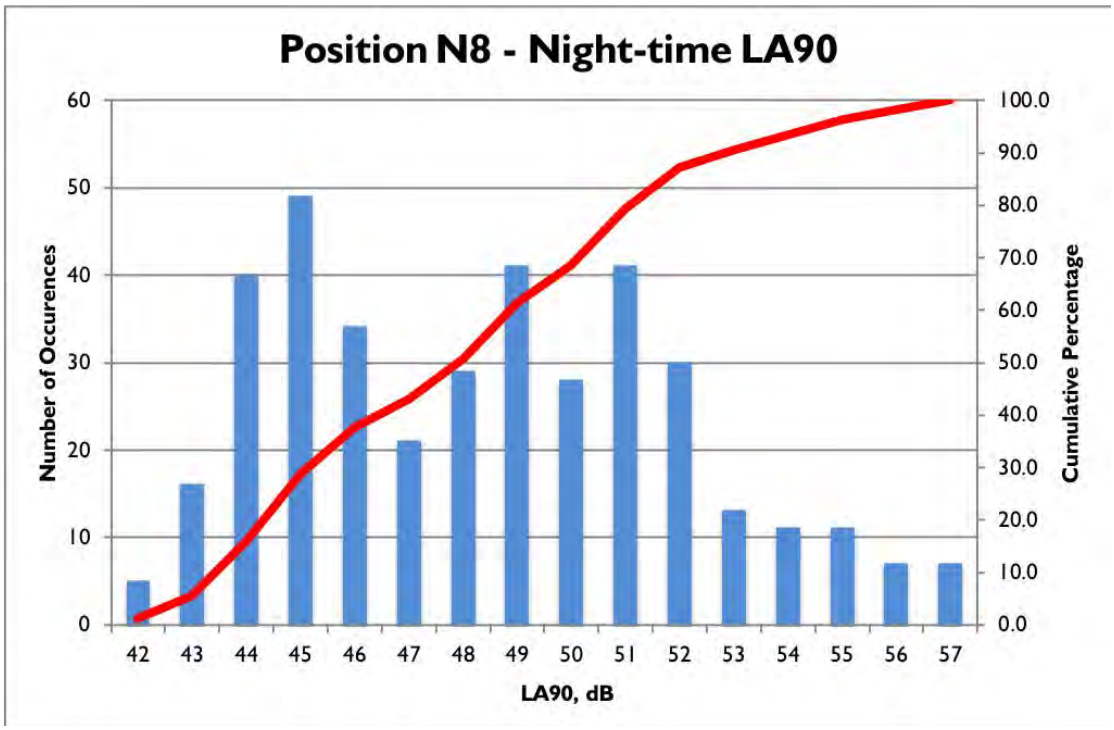


Figure A13A.3.26: L_{A90} distribution, daytime, Position N9

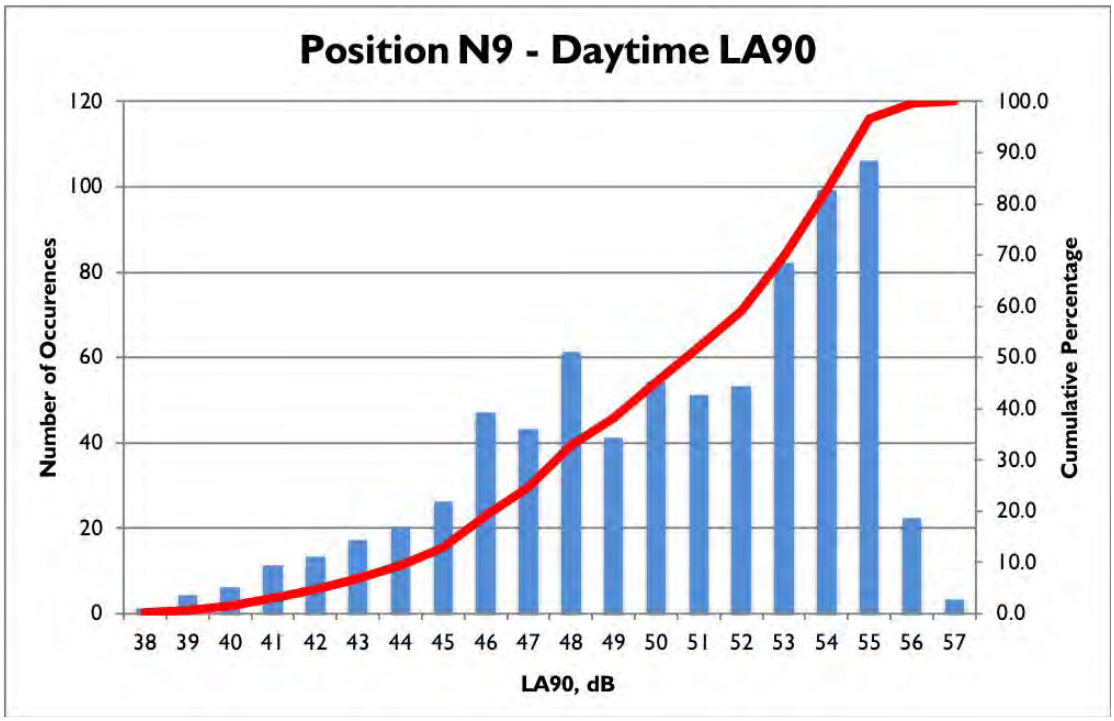


Figure A13A.3.27: L_{A90} distribution, night-time, Position N9

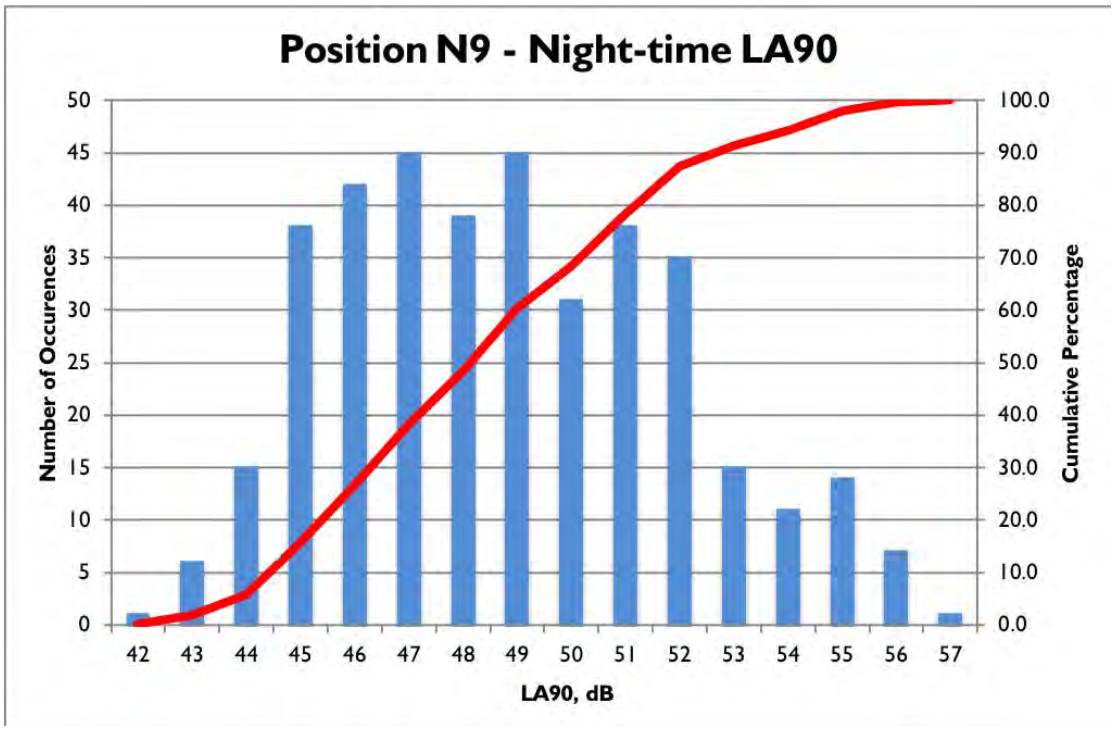


Figure A13A.3.28: L_{A90} distribution, daytime, Position N10

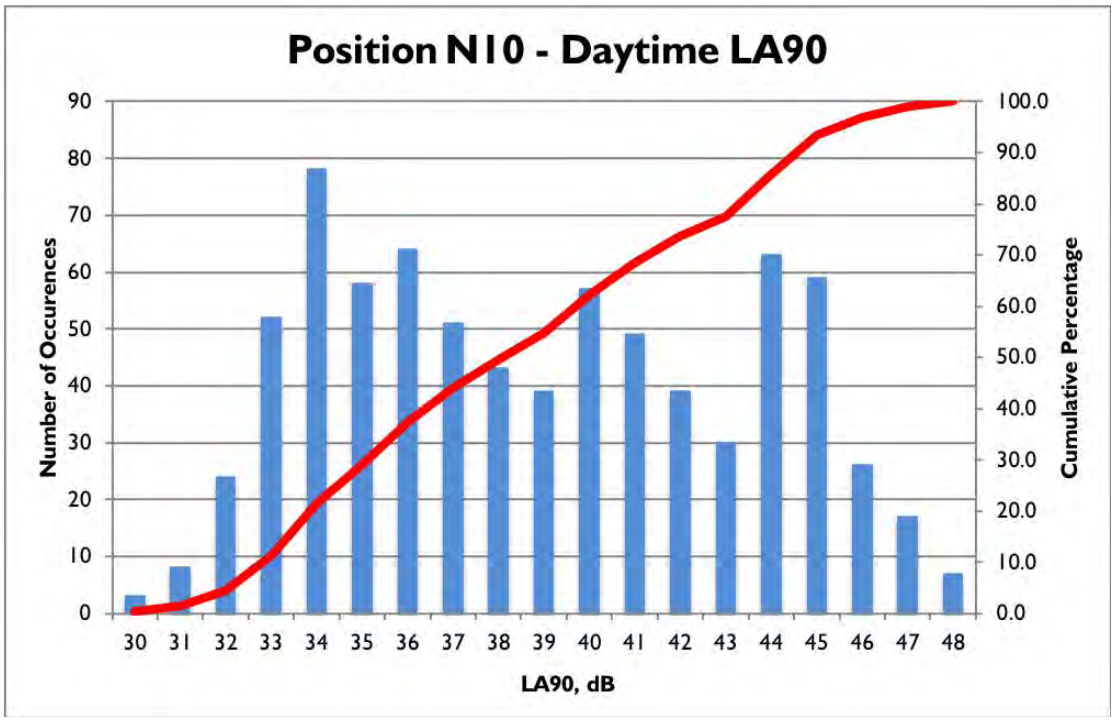


Figure A13A.3.29: L_{A90} distribution, night-time, Position N10

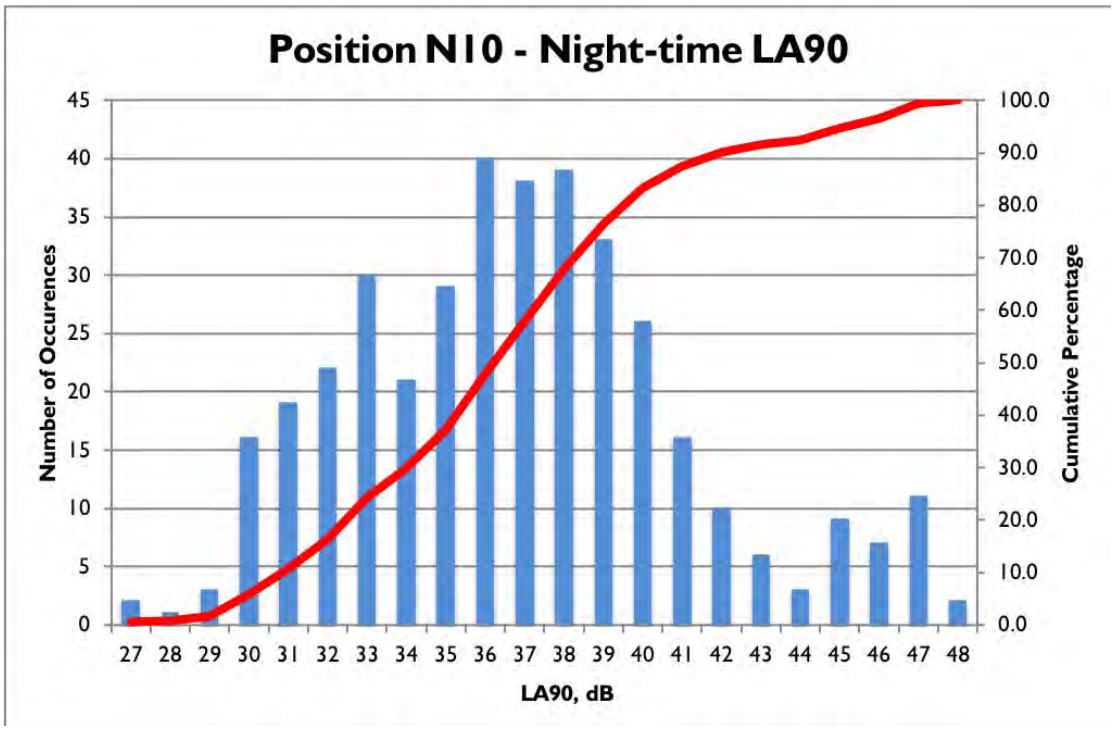


Figure A13A.3.30: L_{A90} distribution, daytime, Position N11

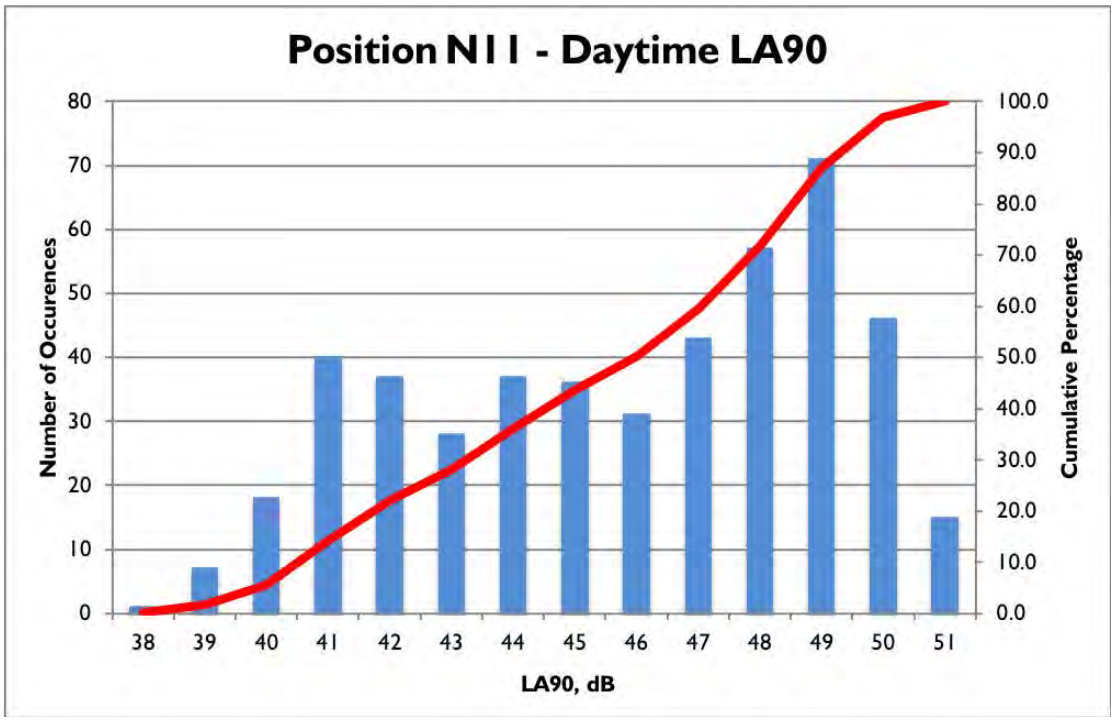


Figure A13A.3.31: L_{A90} distribution, night-time, Position N11

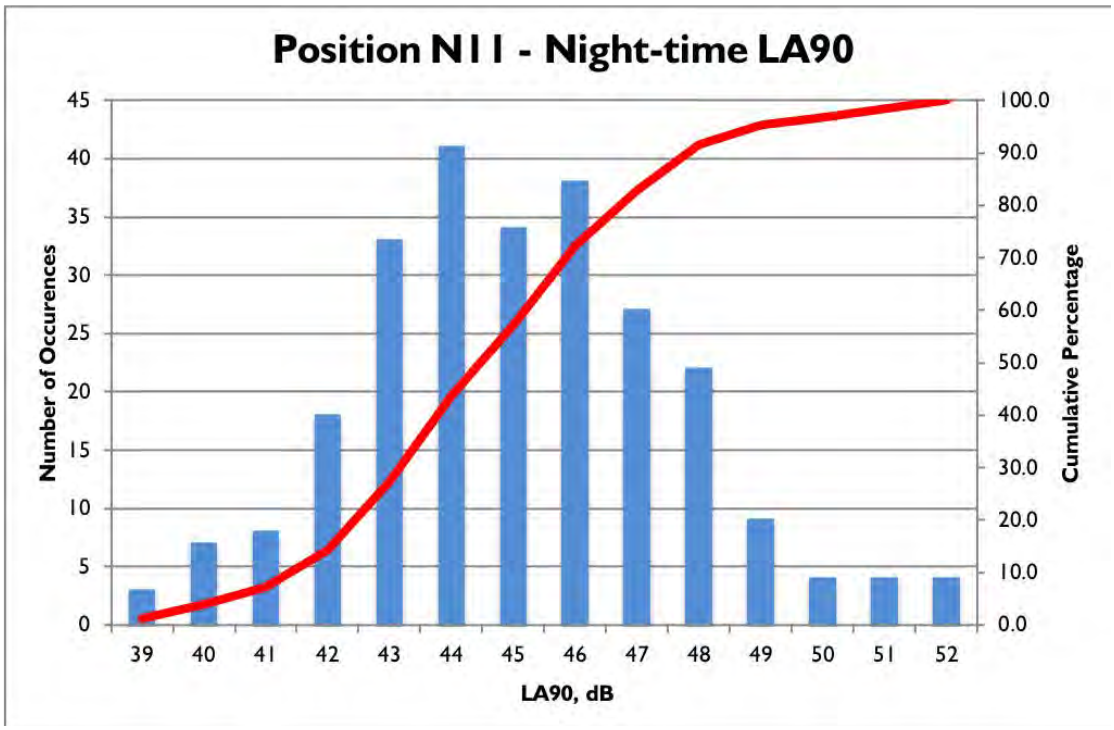


Figure A13A.3.32: L_{A90} distribution, daytime, Position N12

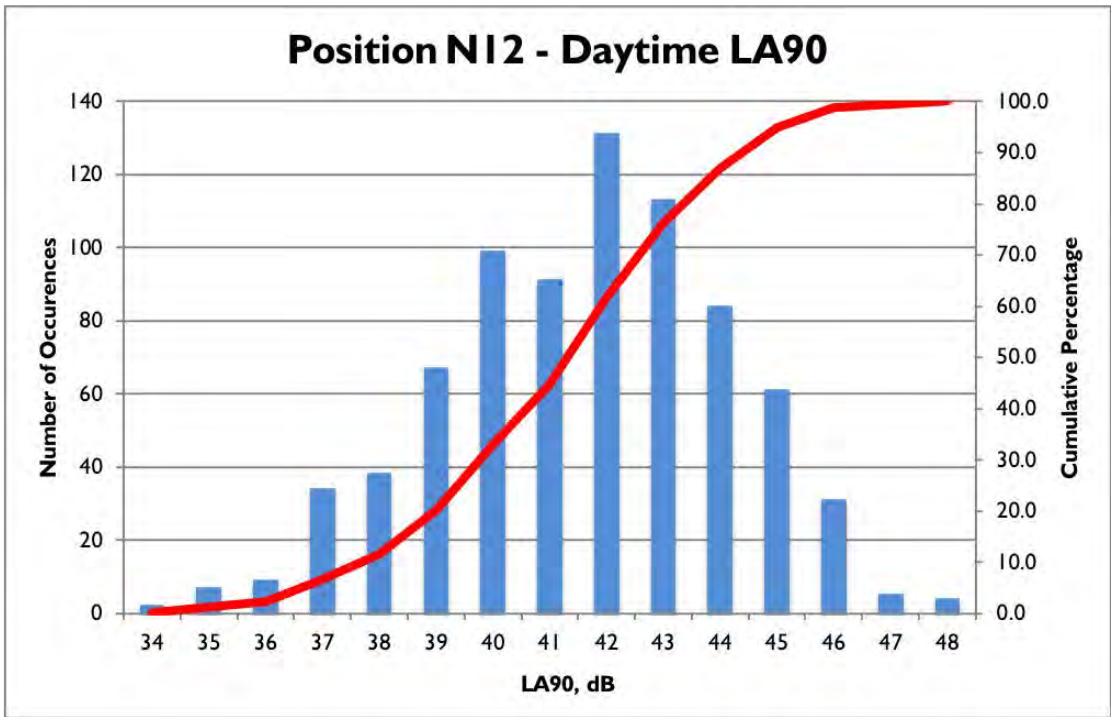


Figure A13A.3.33: L_{A90} distribution, night-time, Position N12

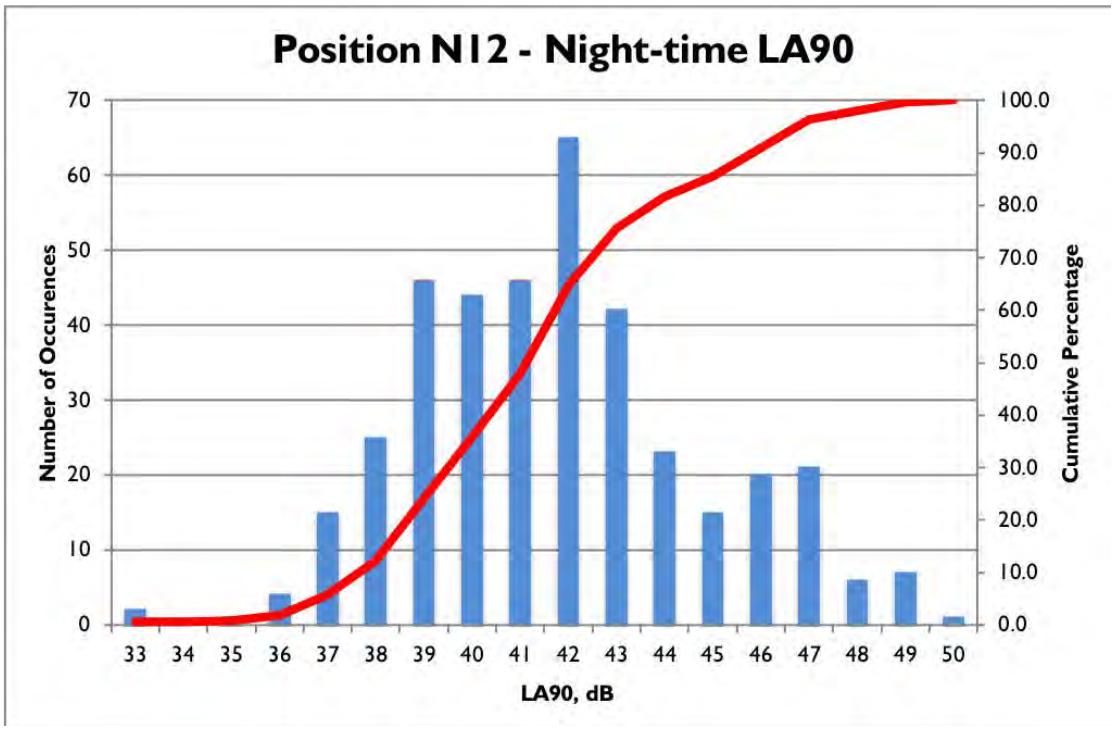


Figure A13A.3.34: L_{Aeq} distribution, daytime, Position N1

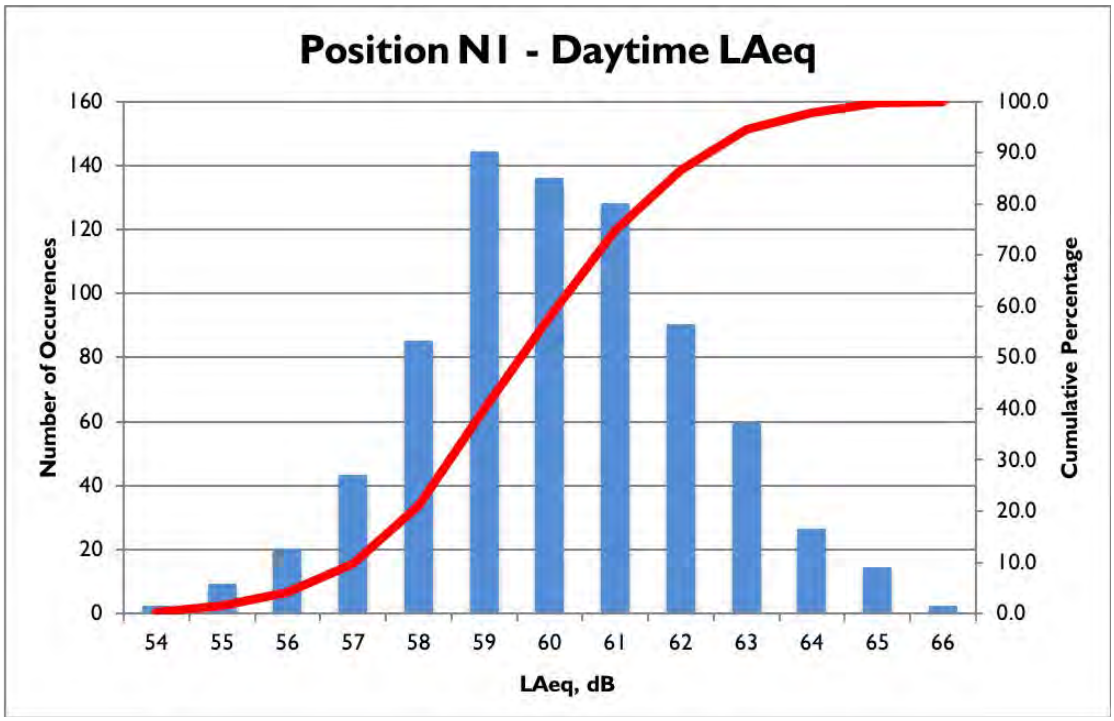


Figure A13A.3.35: L_{Aeq} distribution, night-time, Position N1

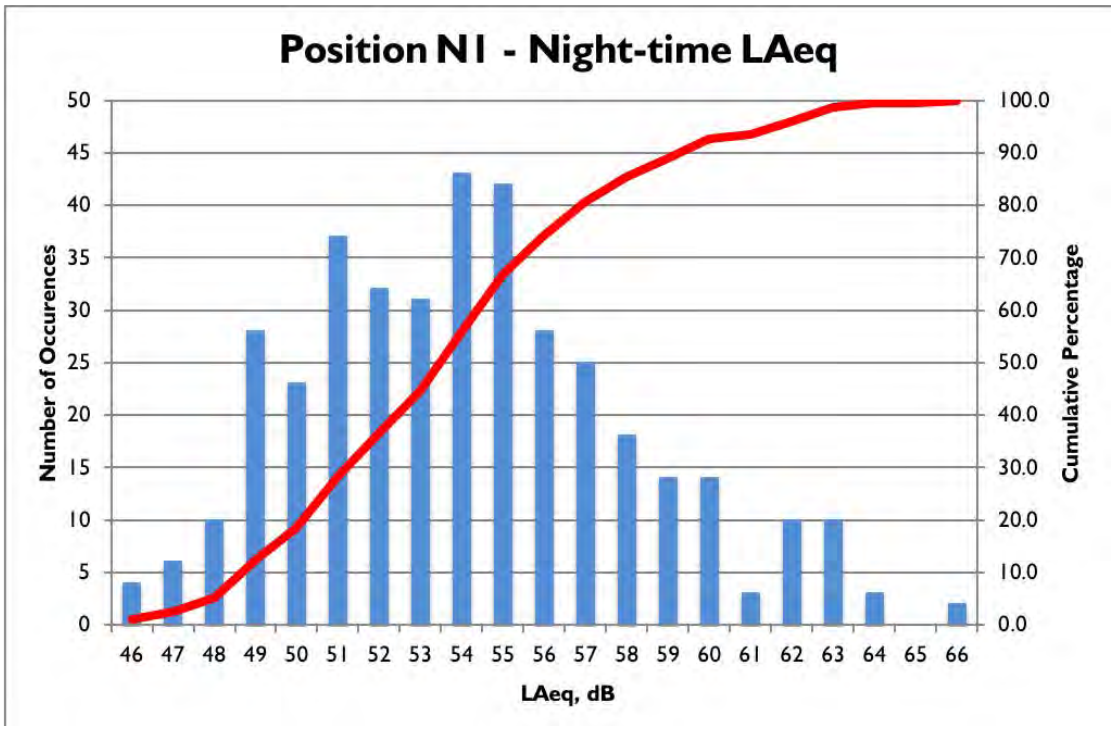


Figure A13A.3.36: L_{Aeq} distribution, daytime, Position N2

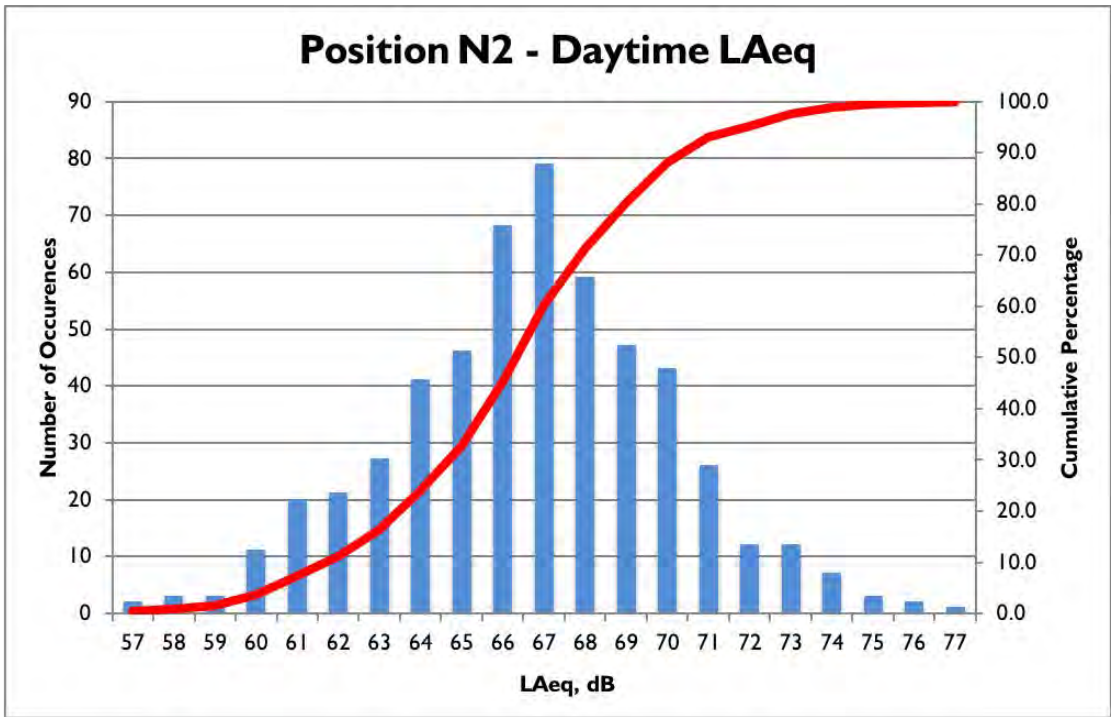


Figure A13A.3.37: L_{Aeq} distribution, night-time, Position N2

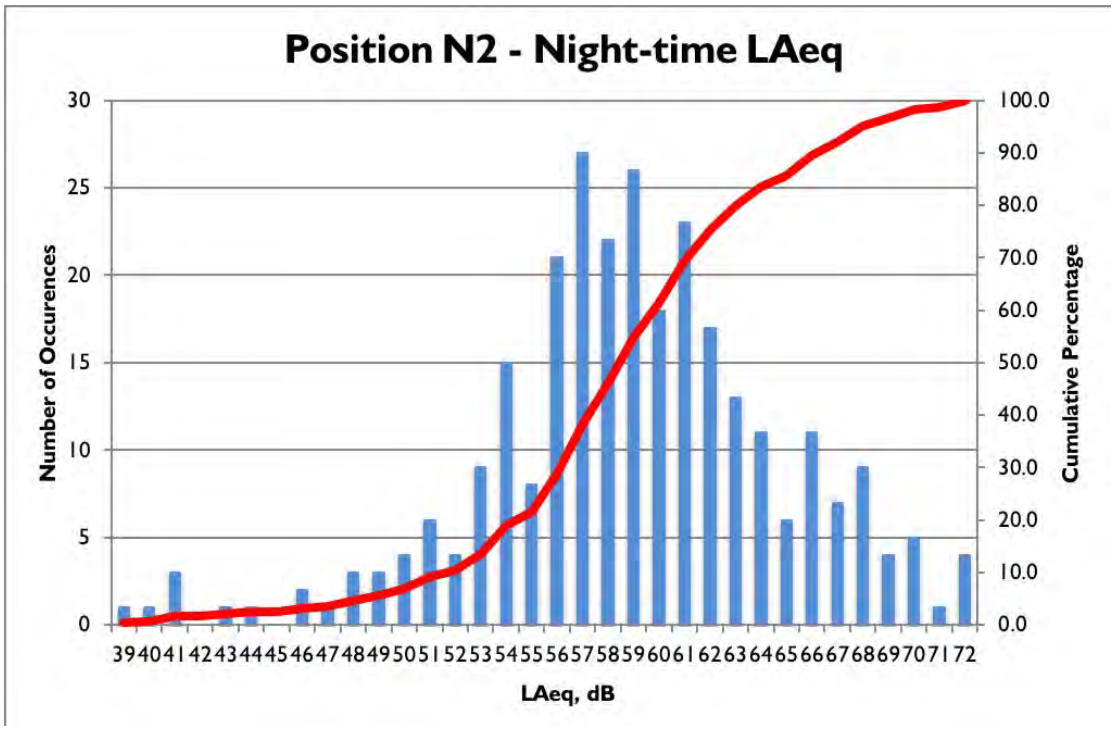


Figure A13A.3.38: L_{Aeq} distribution, daytime, Position N4

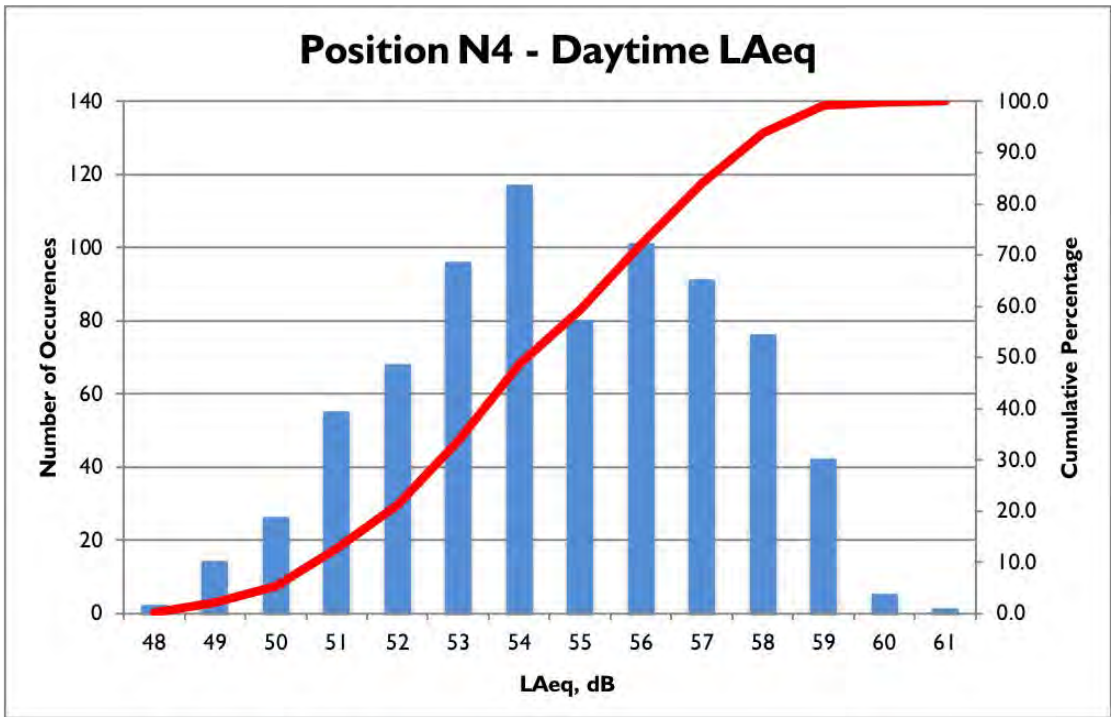


Figure A13A.3.39: L_{Aeq} distribution, night-time, Position N4

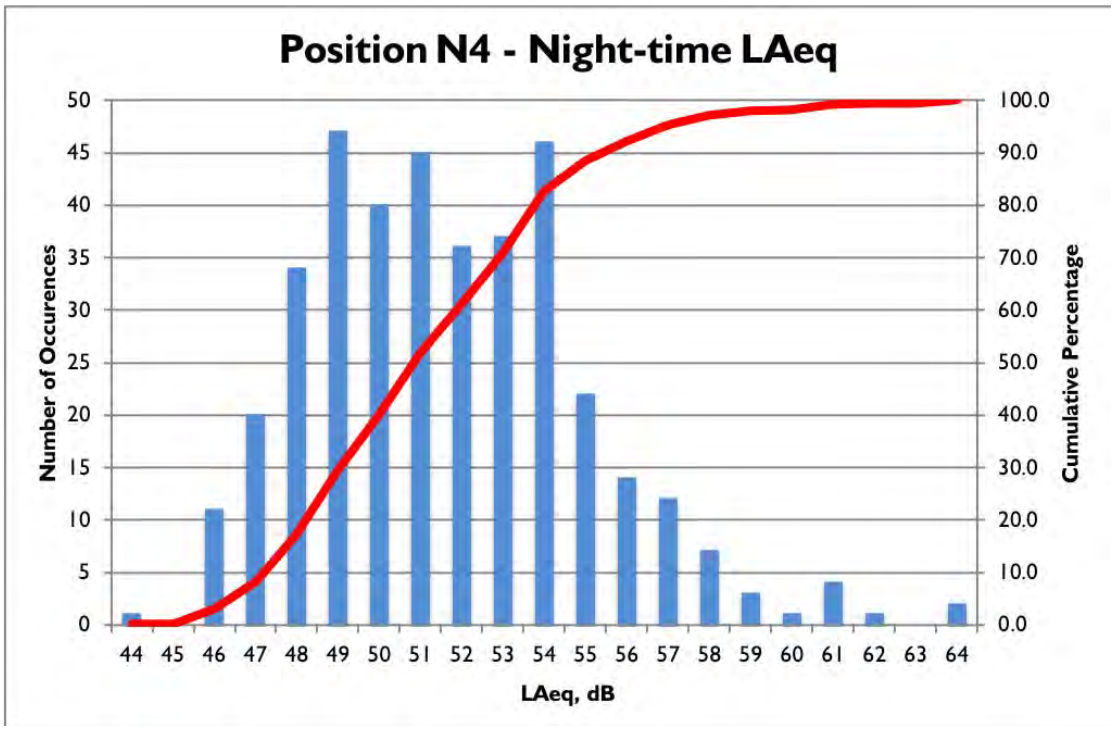


Figure A13A.3.40: L_{Aeq} distribution, daytime, Position N5

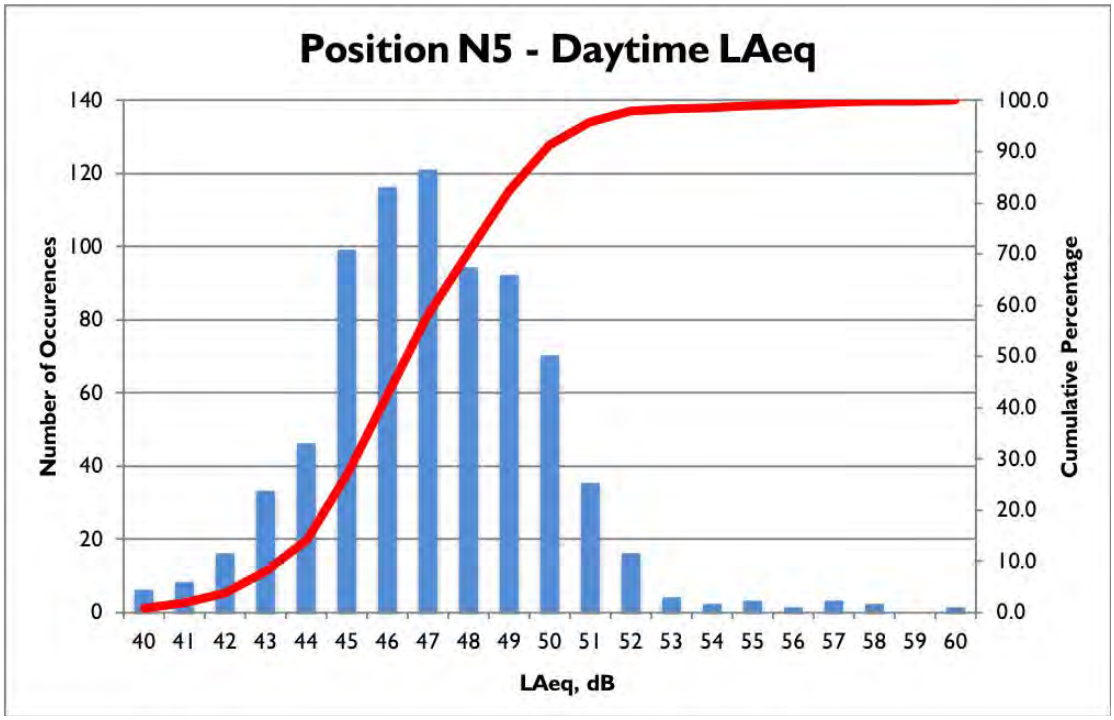


Figure A13A.3.41: L_{Aeq} distribution, night-time, Position N5

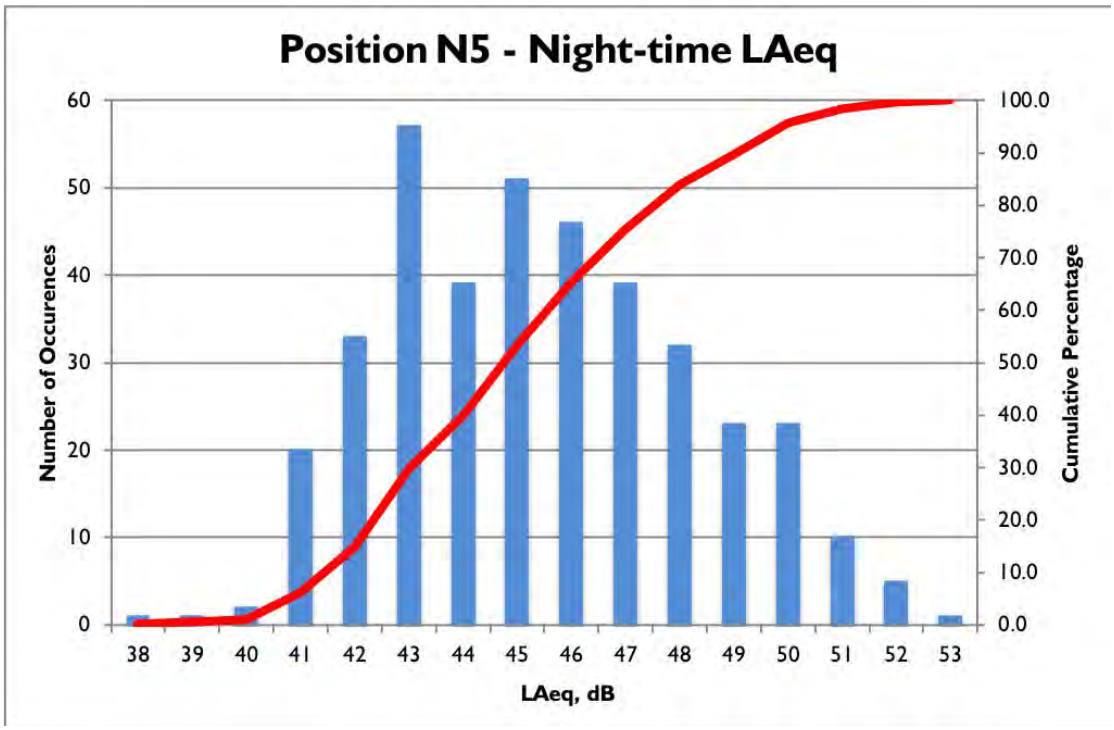


Figure A13A.3.42: L_{Aeq} distribution, daytime, Position N6

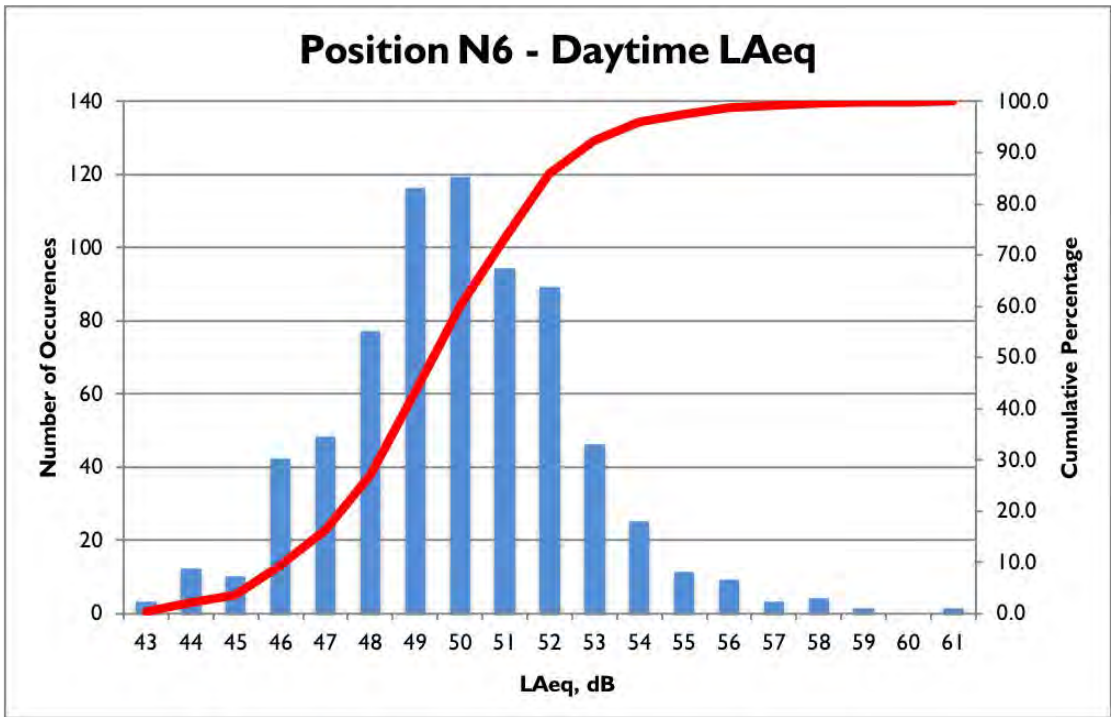


Figure A13A.3.43: L_{Aeq} distribution, night-time, Position N6

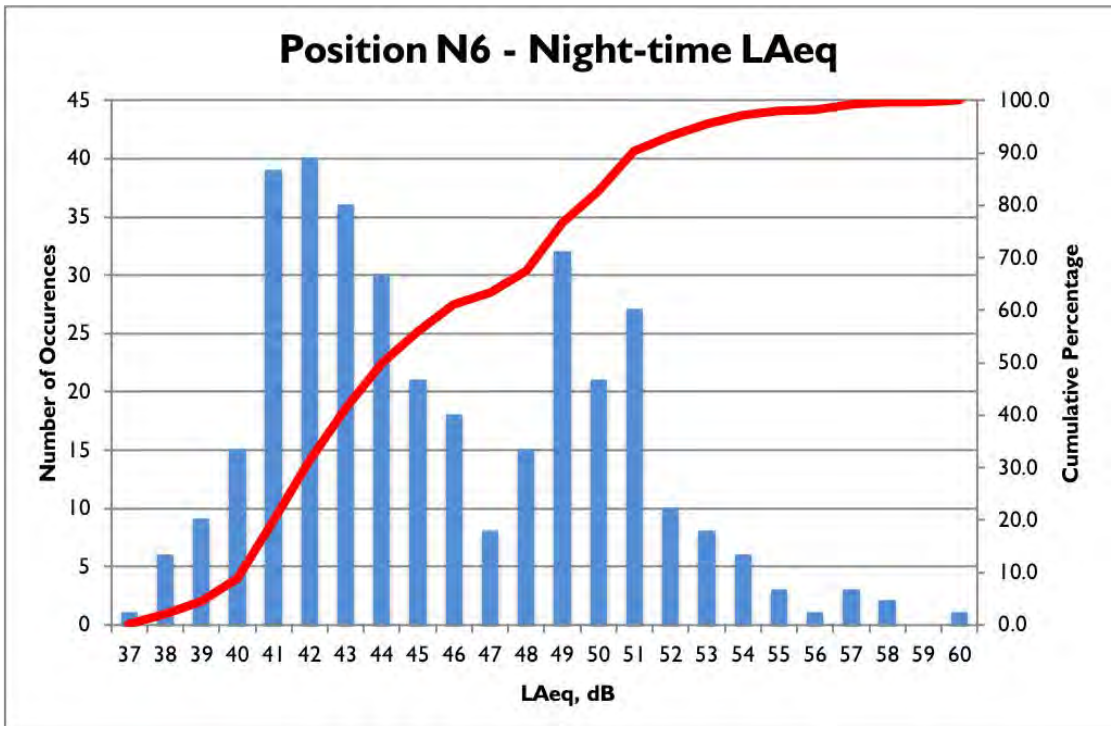


Figure A13A.3.44: L_{Aeq} distribution, daytime, Position N7

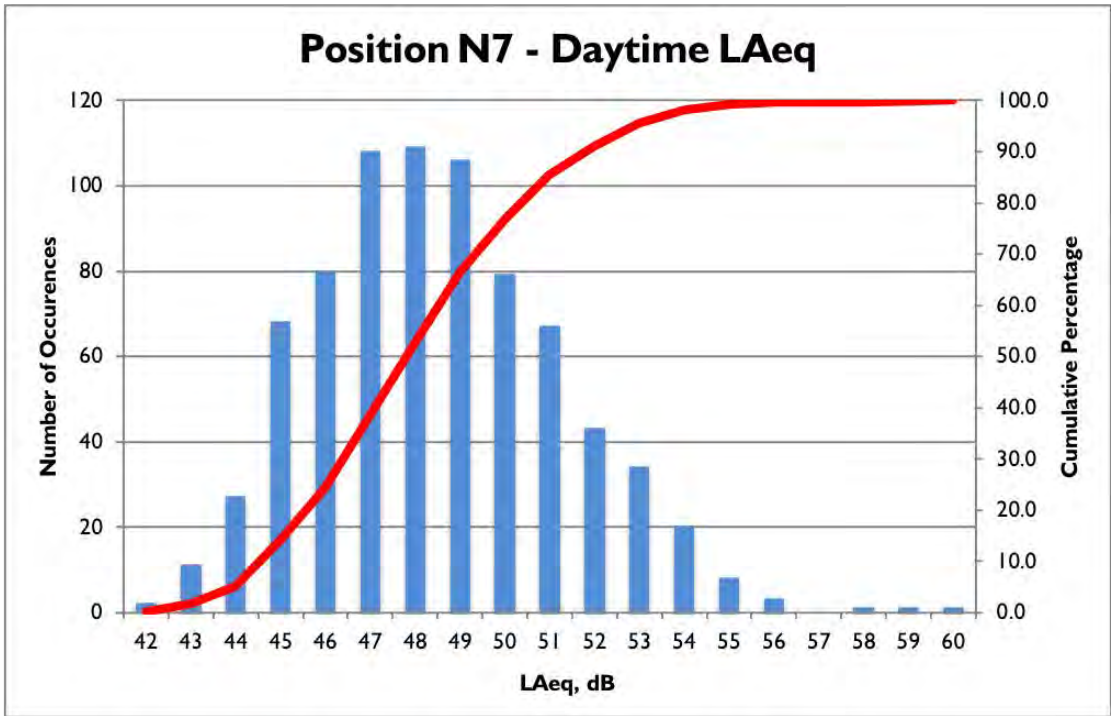


Figure A13A.3.45: L_{Aeq} distribution, night-time, Position N7

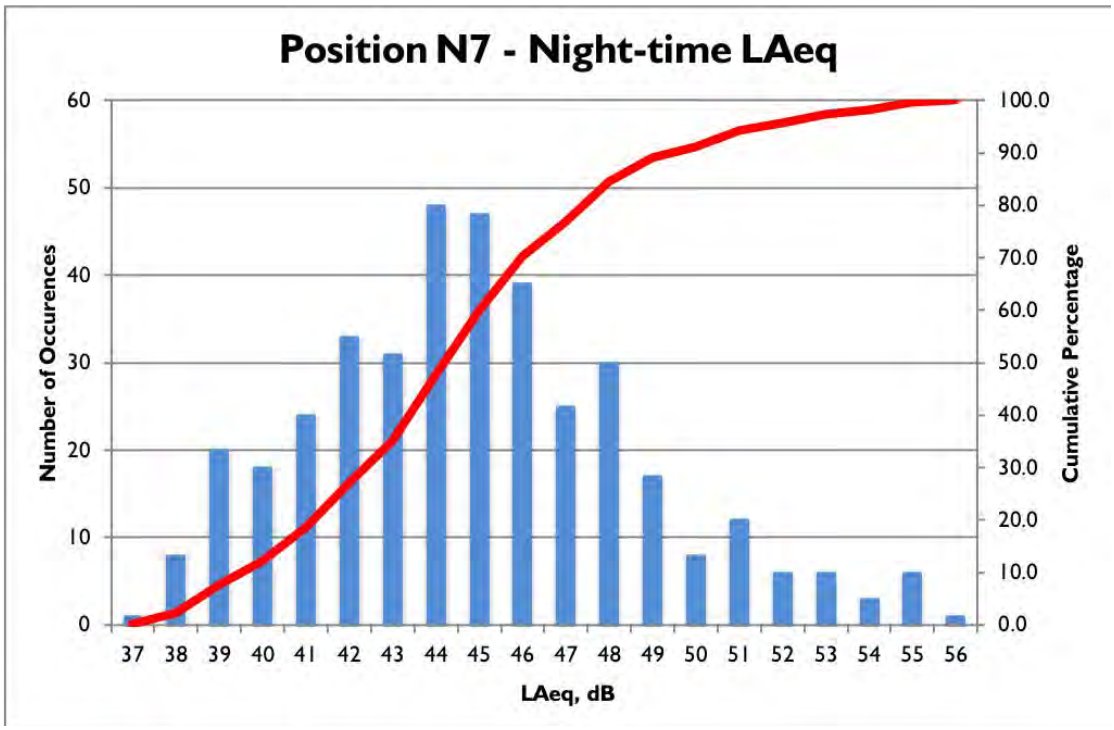


Figure A13A.3.46: L_{Aeq} distribution, daytime, Position N8

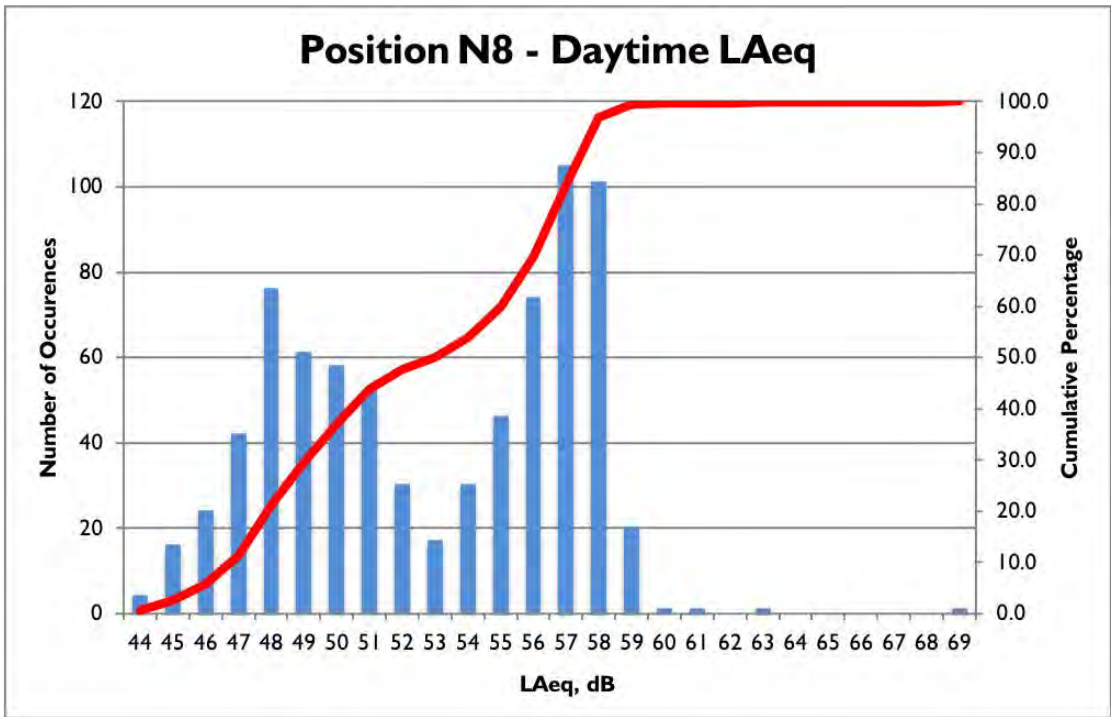


Figure A13A.3.47: L_{Aeq} distribution, night-time, Position N8

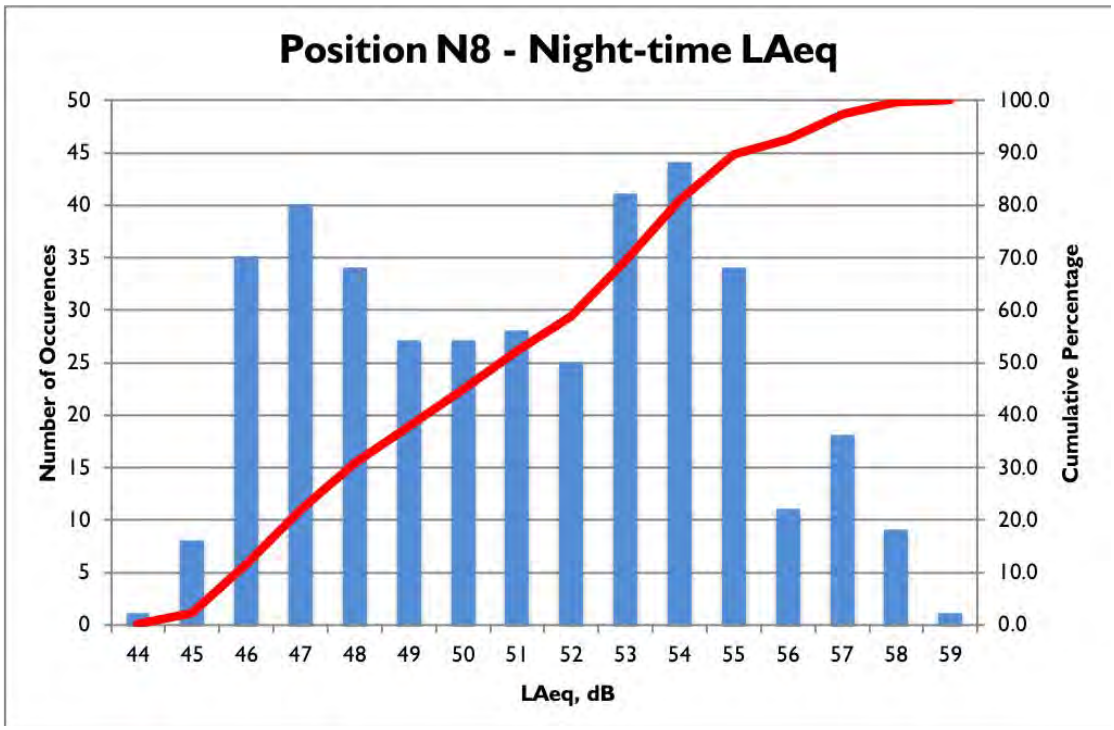


Figure A13A.3.48: L_{Aeq} distribution, daytime, Position N9

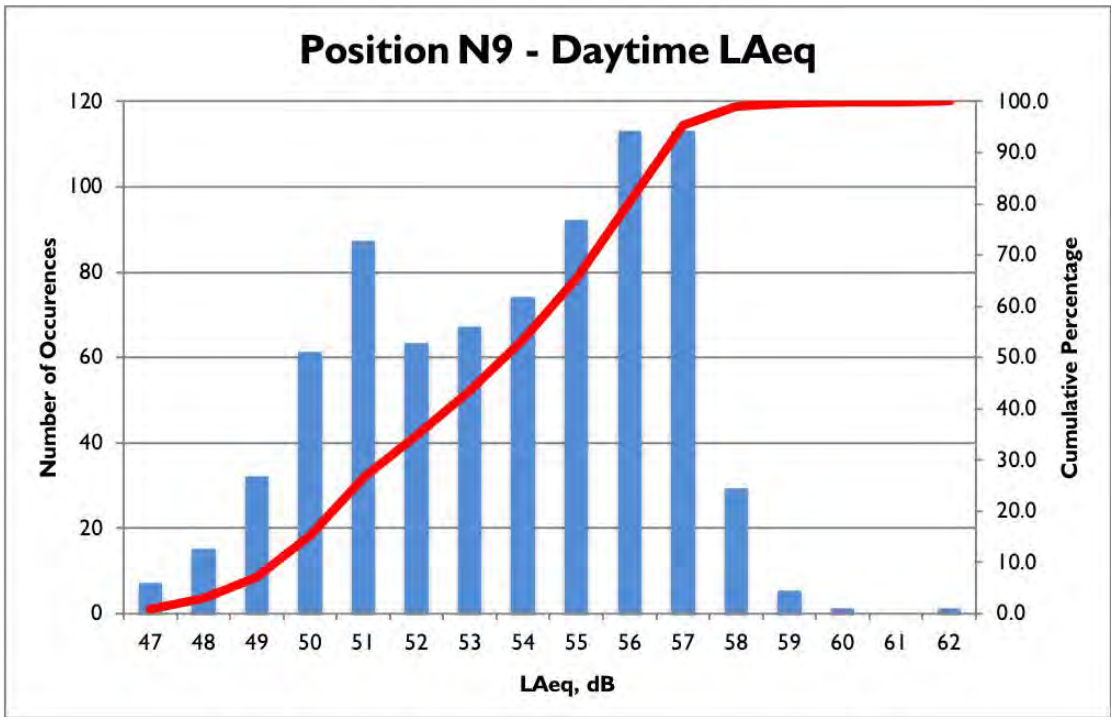


Figure A13A.3.49: L_{Aeq} distribution, night-time, Position N9

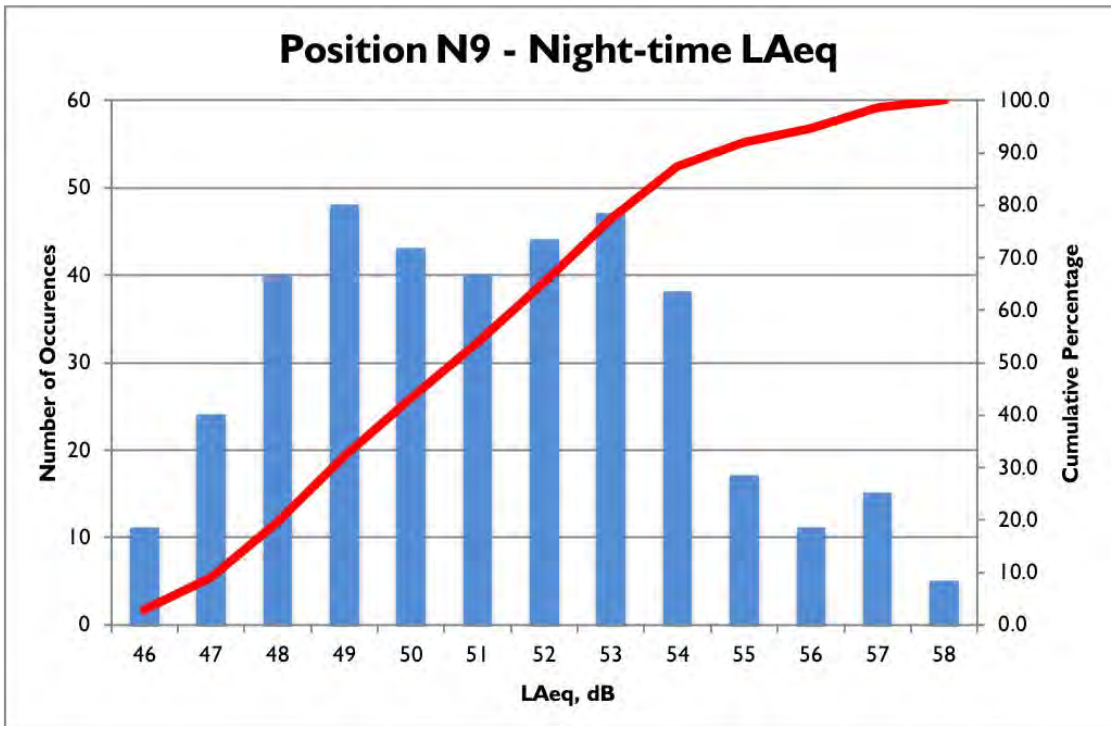


Figure A13A.3.50: L_{Aeq} distribution, daytime, Position N10

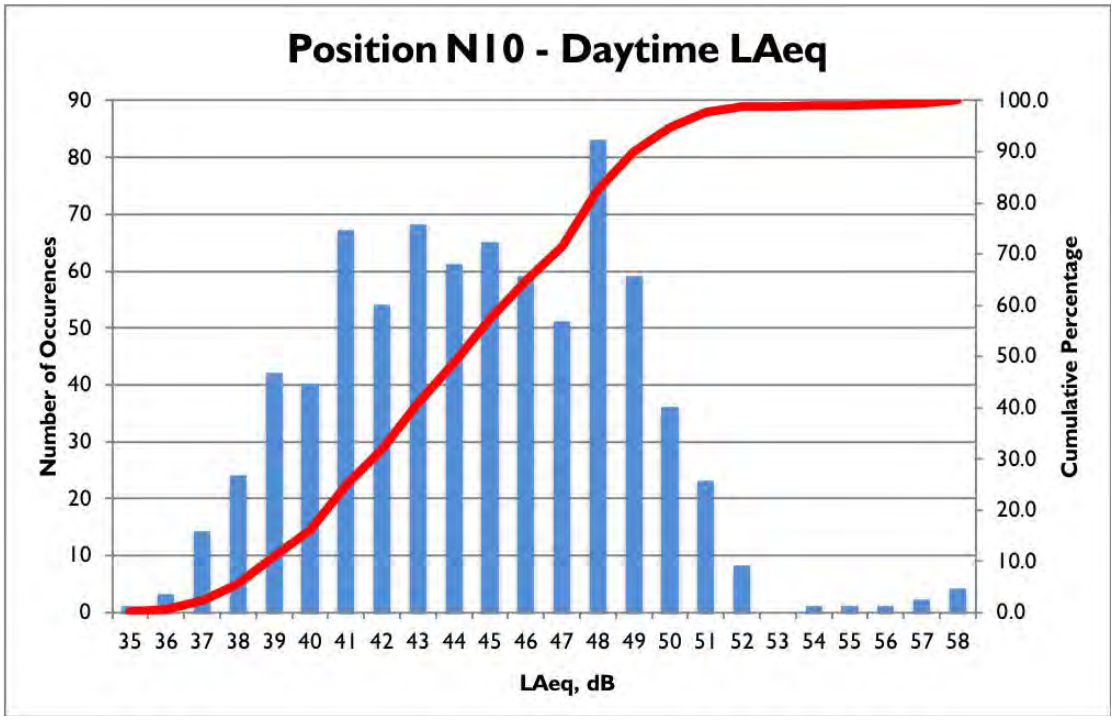


Figure A13A.3.51: L_{Aeq} distribution, night-time, Position N10

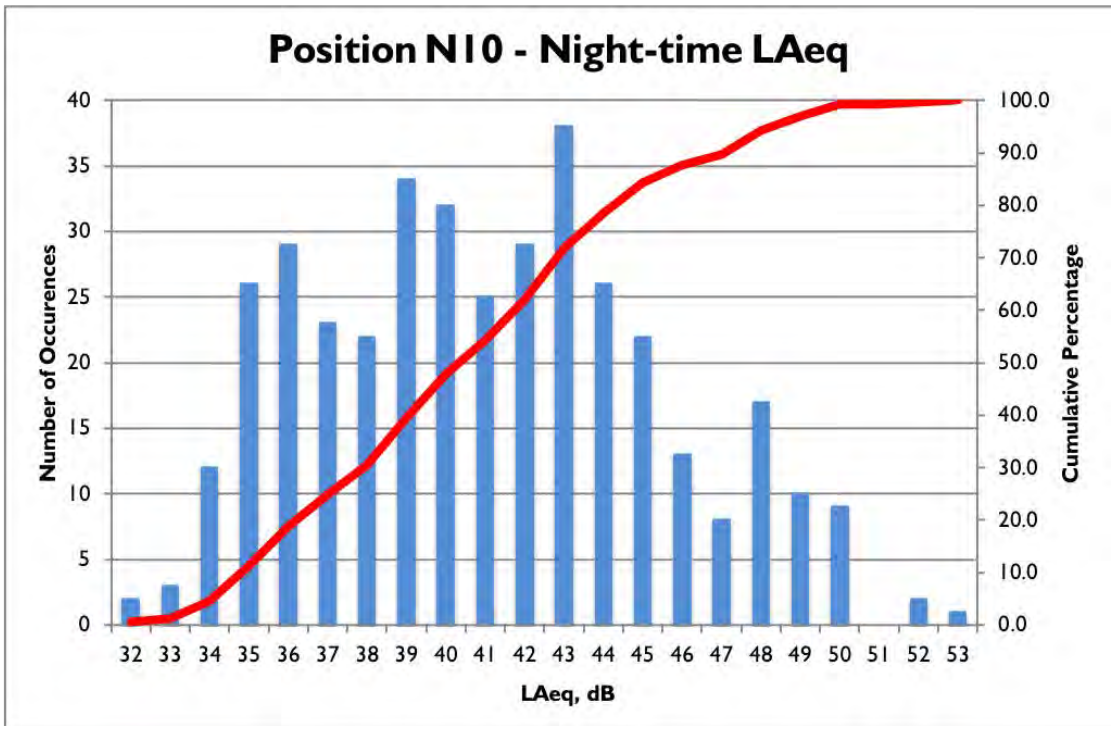


Figure A13A.3.52: L_{Aeq} distribution, daytime, Position N11

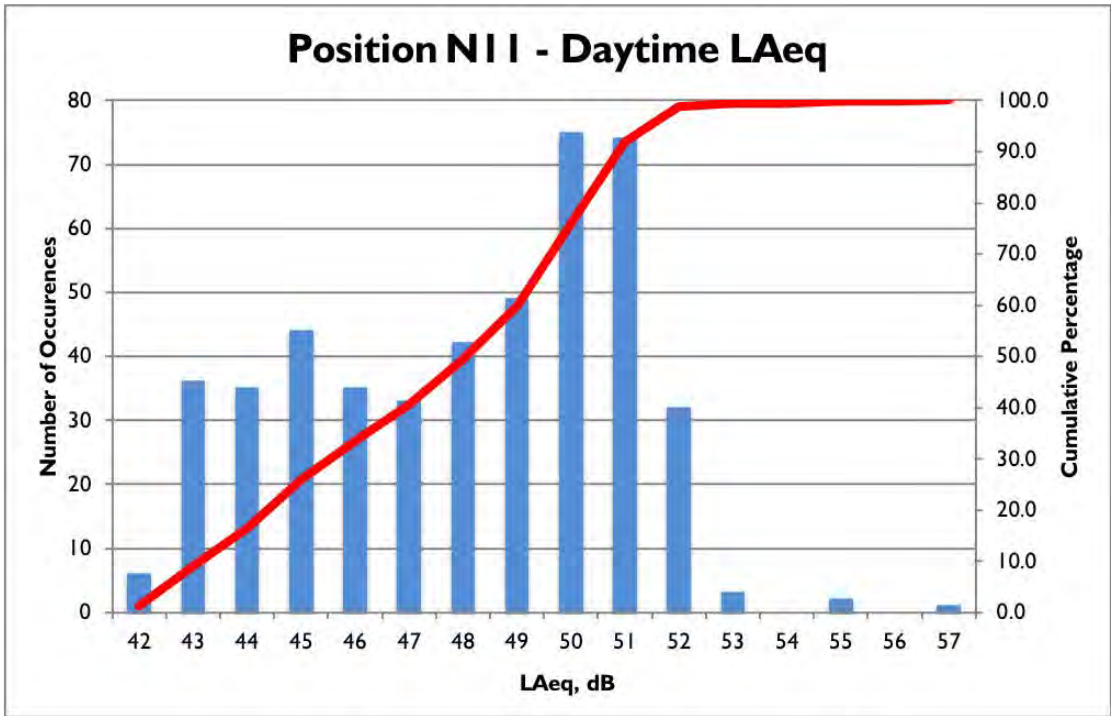


Figure A13A.3.53: L_{Aeq} distribution, night-time, Position N11

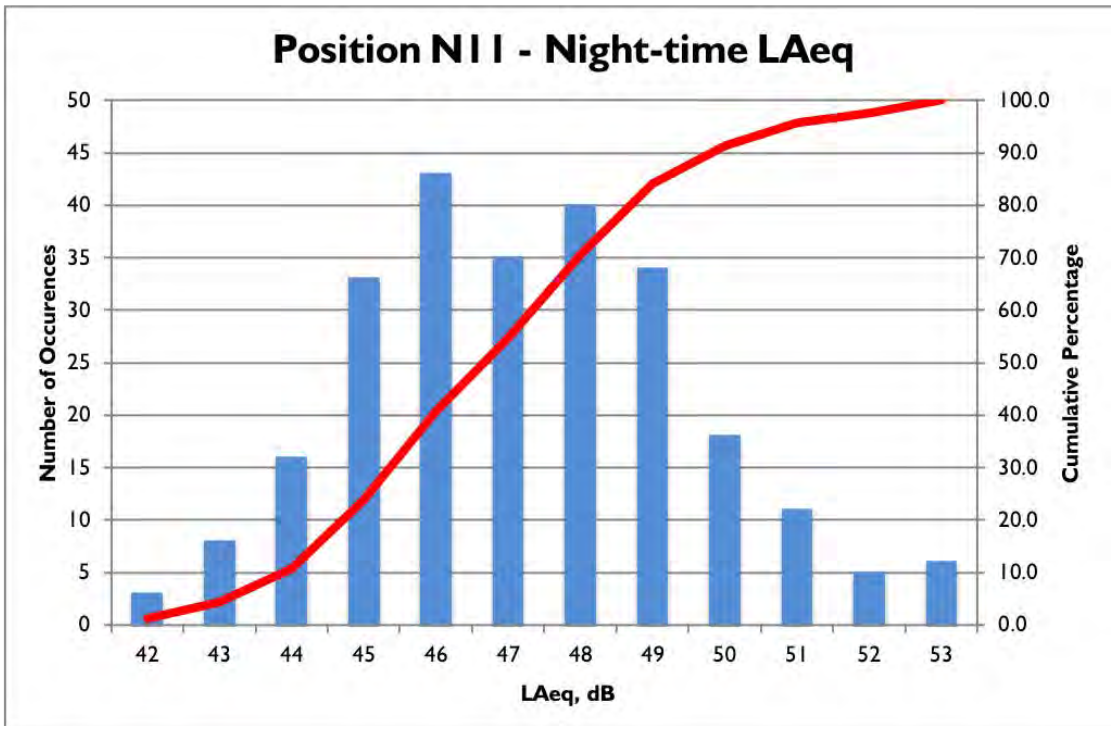


Figure A13A.3.54: L_{Aeq} distribution, daytime, Position N12

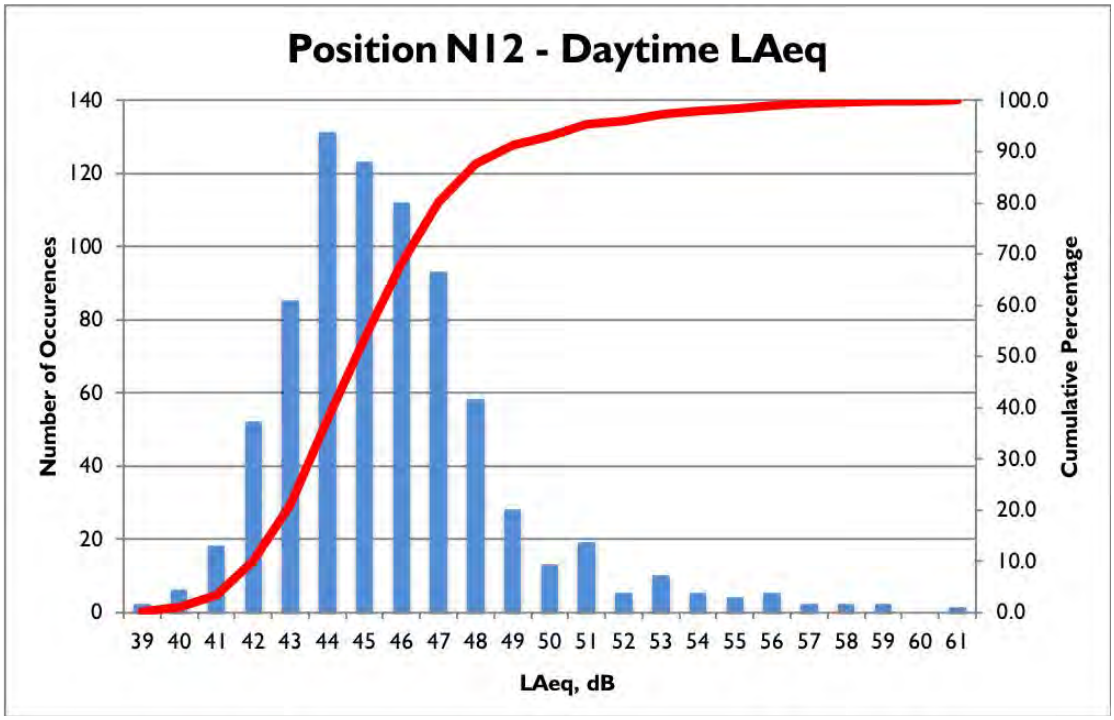
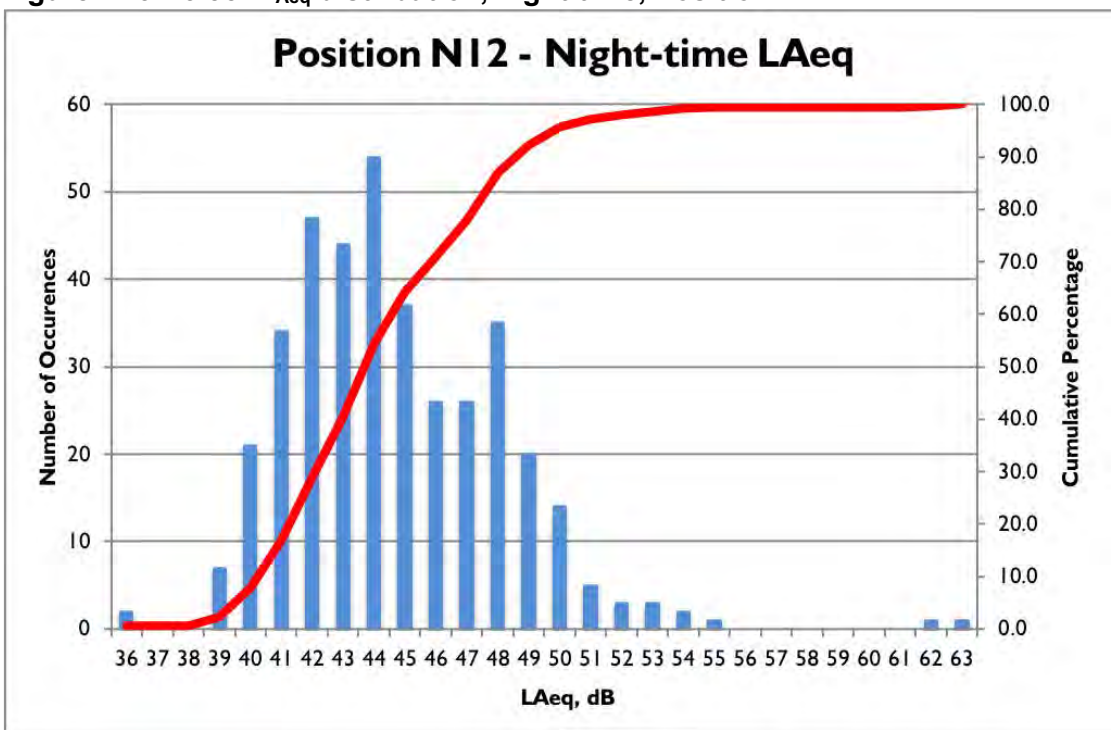


Figure A13A.3.55: L_{Aeq} distribution, night-time, Position N12



Calibration Certificates for Position N1 – June/July 2018 Survey

Documentation Métrologique
Metrological documentation

DUO 12373

Date d'émission :
Date of issue : **17/03/2017**

Référence Document : NOT1536
Nom : Documentation métrologique - *Metrological documentation* FRGB

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support@acoemgroup.com

TABLE DES MATIERES
TABLE OF CONTENT

Chapitre 1.
CONSTAT DE VERIFICATION
VERIFICATION CERTIFICATE

CV-DTE-L-17-PVE-47775

DELIVRE PAR :
ISSUED BY

ACOEM

Service Métrologie
200 Chemin des Ormeaux

69760 LIMONEST
France

INSTRUMENT VERIFIE
INSTRUMENT CHECKED

Désignation :
Designation :

Sonomètre Intégrateur-Moyenneur
Integrating-Averaging Sound Level Meter

Constructeur :
Manufacturer :

01dB

Type :
Type :

DUO

N° de serie :
Serial number :

12373

N° d'identification :
Identification number

Date d'émission :
Date of issue :

17/03/2017

Ce constat comprend 5 pages
This certificate includes *pages*

LE RESPONSABLE METROLOGIQUE
DU LABORATOIRE
HEAD OF THE METROLOGY LAB
François MAGAND

[redacted]

IDENTIFICATION :
IDENTIFICATION:

	Sonomètre *Sound level meter*	Préamplificateur *Preamplifier*	Microphone *Microphone*
Constructeur : *Manufacturer*	01dB		GRAS
Type : *Type*	DUO	Interne - Internal	40CD
Numéro de série : *Serial number*	12373		287751

PROGRAMME DE VERIFICATION :
VERIFICATION PROGRAM:

Ce sonomètre a été vérifié sur les caractéristiques suivantes:

- Réponse en fréquence du sonomètre
- Linéarité
- Pondérations fréquentielles A-B-C-Z
- Bruit de fond
- Filtre 1/1 et 1/3 octave

This sound level meter has been verified on its following characteristics:

- *Frequency response of the sound level meter*
- *Linearity*
- *A-B-C-Z Weighting*
- *Background noise*
- *1/1 and 1/3 Octave filter*

METHODE DE VERIFICATION :
VERIFICATION METHOD:

L'appareil est vérifié dans une salle climatisée. Les caractéristiques sont vérifiées étalonnées avec un multimètre et un générateur étalonnés en amplitude et en fréquence. Des corrections constructeurs sont appliquées pour prendre en compte les effets des accessoires et du boîtier selon la norme IEC 61672-3

The instrument is controlled in an air conditioned room. The other characteristics are verified with multimeter and generator calibrated in amplitude and in frequency. Some manufacturer's corrections have been applied to account the acoustical effect from the case of the sound level meter and his accessories (IEC 61672-3).

CONDITIONS DE VERIFICATION :
VERIFICATION CONDITIONS:

Date de l'étalonnage : *Date of Calibration [French format]*	**.17 - 3 - 2017 .**
Nom de l'opérateur : *Operator Name*	**Stéphane Trève**
Instruction d'étalonnage : *Calibration instruction*	**P118-NOT-01**
Pression atmosphérique : *Static pressure*	**98,7 kPa**
Température : *Temperature*	**24,8 °C**
Taux d'humidité relative : *Relative humidity*	**32,9 %HR**

MOYENS DE MESURE UTILISES POUR LA VERIFICATION :

INSTRUMENTS USED FOR VERIFICATION:

Désignation Designation	Constructeur Manufacturer	Type Type	N° de série Serial number	N° d'identification Identification number
Générateur de fonction / Waveform generator	Helwet-Packard	HP 33120 A	US36028745	APM 1163
Boite à décades / Decade box	01dB-Metravib	OUT1694	1605202	APM 5541

Tous les moyens de mesure utilisés sont raccordés aux étalons de référence de la société ACOEM. Les étalons de référence de la société ACOEM sont raccordés aux étalons nationaux par un étalonnage COFRAC. La liste de ces étalons est disponible sur simple demande auprès du responsable métrologique du laboratoire.

All the measuring instruments are calibrated using the ACOEM reference standards. ACOEM reference standards are calibrated with COFRAC certificate of calibration. The reference standard list is available on simple request to the head of the Metrology Lab.

RESULTATS :

RESULTS:

Le jugement de conformité de chaque test est établi suivant les tolérances données dans les normes suivantes : *Conformity decision has been taken with the tolerance descriptions in the following standards:*	IEC 61260 IEC 61672-1 classe	1
	ANSI S1.11 class ANSI S1.4 class	1

Linéarité
Linearity

Description *Description*	Résultat *Result*
Linéarité *Linearity*	Conforme *Compliant*

Pondérations fréquentielles A-B-C-Z
A-B-C-Z Weightings

Description *Description*	Résultat *Result*
Pondération fréquentielle *Frequency weighting*	Conforme *Compliant*

Bruit de fond
Background noise

Description *Description*	Résultat *Result*
Bruit de fond *Noise level*	Conforme *Compliant*

Filtre d'octave
1/1 Octave filter

Description *Description*	Résultat *Result*
Fréquence centrale filtre 1/1 octave *1/1 Octave filter central frequency attenuation*	Conforme *Compliant*

Filtre de 1/3 d'octave
1/3 Octave filter

Description *Description*	Résultat *Result*
Fréquence centrale filtre 1/3 octave *1/3 Octave filter central frequency attenuation*	Conforme *Compliant*

Les données liées au DMK01 sont issues de la réponse en fréquence du microphone associé à l'influence typique du DMK01.
The DMK01's results describes the association of the microphone acoustical response with the tipical DMK01 influence.

Fin du constat de vérification End of verification certificate

Chapitre 2.
CERTIFICAT D'ETALONNAGE
CALIBRATION CERTIFICATE

CE-DTE-L-17-PVE-47775

DELIVRE PAR :
ISSUED BY

ACOEM

Service Métrologie
200 Chemin des Ormeaux

69760 LIMONEST
France

INSTRUMENT ETALONNE
CALIBRATED INSTRUMENT

Désignation :
Designation :
Sonomètre Intégrateur-Moyenneur
Integrating-Averaging Sound Level Meter

Constructeur :
Manufacturer :
01dB

Type :
Type :
DUO

N° de serie :
Serial number :
12373

N° d'identification :
Identification number

Date d'émission :
Date of issue :
17/03/2017

Ce certificat comprend 10 Pages
This certificate includes *Pages*

LE RESPONSABLE METROLOGIQUE
DU LABORATOIRE
HEAD OF THE METROLOGY LAB
François MAGAND

[redacted]

CE CERTIFICAT EST CONFORME AU FASCICULE DE DOCUMENTATION FD X 07-012.
THIS CERTIFICATE IS COMPLIANT WITH THE FD X 07-012 STANDARD DOCUMENTATION

IDENTIFICATION :
IDENTIFICATION:

	Sonomètre *Sound level meter*	Préamplificateur *Preamplifier*	Microphone *Microphone*
Constructeur : *Manufacturer*	01dB		GRAS
Type : *Type*	DUO	Interne - Internal	40CD
Numéro de série : *Serial number*	12373		287751

PROGRAMME D'ETALONNAGE :
CALIBRATION PROGRAM:

Ce Sonomètre a été étalonné sur les caractéristiques suivantes :

- Réponse en fréquence du sonomètre en champ libre
- Linéarité
- Pondérations fréquentielles A-B-C-Z

The Sound level meter has been calibrated on the following characteristics:

- *Free field frequency response of the sound level meter*
- *Linearity*
- *A-B-C-Z frequency weightings*

METHODE D'ETALONNAGE :
CALIBRATION METHOD:

L'appareil est étalonné dans une salle climatisée. Les caractéristiques sont étalonnées avec un multimètre et un générateur étalonnés en amplitude et en fréquence. Des corrections constructeurs sont appliquées pour prendre en compte les effets des accessoires et du boîtier selon la norme IEC 61672-3

The instrument is calibrated in an air conditioned room.. The other characteristics are verified with multimeter and generator calibrated in amplitude and in frequency. Some manufacturer's corrections have been applied to account the acoustical effect from the case of the sound level meter and his accessories (IEC 61672-3).

CONDITIONS D'ETALONNAGE :
CALIBRATION CONDITIONS:

Date de l'étalonnage : *Date of Calibration [French format]*	**.17 - 3 - 2017 .**
Nom de l'opérateur : *Operator Name*	**Stéphane Trève**
Instruction d'étalonnage : *Calibration instruction*	**P118-NOT-01**
Pression atmosphérique : *Static pressure*	**98,7 kPa**
Température : *Temperature*	**24,8 °C**
Taux d'humidité relative : *Relative humidity*	**32,9 %HR**

MOYENS DE MESURES UTILISES POUR L'ETALONNAGE :

INSTRUMENTS USED FOR CALIBRATION:

Désignation	Constructeur	Type	N° de série	N° d'identification
Designation	Manufacturer	Type	Serial number	Identification number
Générateur de fonction / Waveform generator	Helwet-Packard	HP 33120 A	US36028745	APM 1163
Boite à décades / Decade box	01dB-Metravib	OUT1694	1605202	APM 5541

Tous les moyens de mesure utilisés sont raccordés aux étalons de référence de la société ACOEM. Les étalons de référence de la société ACOEM sont raccordés aux étalons nationaux par un étalonnage COFRAC. La liste de ces étalons est disponible sur simple demande auprès du responsable métrologique du laboratoire.

All the measuring instruments are calibrated using the ACOEM reference standards. ACOEM reference standards are calibrated to national standard with COFRAC certificate of calibration. The reference standards list is available on simple request to the head of the Metrology lab.

RESULTATS :

RESULTS:

Les incertitudes élargies mentionnées sont celles correspondant à deux incertitudes types (k=2). Les incertitudes types sont calculées en tenant compte des différentes composantes d'incertitudes, étalons de référence, moyens d'étalonnage, conditions d'environnement, contribution de l'instrument étalonné, répétabilité …

Mentioned expanded uncertainties correspond to two standard uncertainty types (k=2). Standard uncertainties are calculated including different uncertainty components, reference standards, instruments used, environmental conditions, calibrated instrument contribution, repeatability…

Pondération fréquentielle
Frequency Weighting

Pondération fréquentielle (voie interne) - Frequency weighting (primary channel)					
Z	*0° Short windscreen*	*0° RA0208 + integral windscreen*	*90° RA208 + short windscreen*	*90° Ra0208 + integral windscreen*	Incertitude uncertainty (dB)
63 Hz	-0,8	-0,6	-0,8	-0,7	0,45
125 Hz	-0,7	-0,5	-0,7	-0,6	0,45
250 Hz	-0,6	-0,5	-0,7	-0,6	0,29
500 Hz	-0,5	-0,4	-0,6	-0,6	0,29
1000 Hz	-0,4	-0,4	-0,4	-0,4	0,29
2000 Hz	0,1	0,1	0,1	-0,1	0,29
4000 Hz	-0,3	0,1	0,3	0,0	0,39
8000 Hz	-0,3	-1,2	-0,7	-0,8	0,61
16000 Hz	-0,6	-2,6	-6,6	-6,4	0,61
A	*0° Short windscreen*	*0° RA0208 + integral windscreen*	*90° RA208 + short windscreen*	*90° Ra0208 + integral windscreen*	Incertitude uncertainty (dB)
63 Hz	-27,0	-26,9	-27,0	-27,0	0,45
125 Hz	-16,9	-16,7	-16,9	-16,8	0,45
250 Hz	-9,2	-9,1	-9,4	-9,3	0,29
500 Hz	-3,7	-3,7	-3,9	-3,8	0,29
1000 Hz	-0,4	-0,4	-0,4	-0,4	0,29
2000 Hz	1,3	1,3	1,3	1,2	0,29
4000 Hz	0,7	1,1	1,3	0,9	0,39
8000 Hz	-1,9	-2,8	-2,3	-2,4	0,61
16000 Hz	-12,6	-14,6	-18,6	-18,4	0,61
B	*0° Short windscreen*	*0° RA0208 + integral windscreen*	*90° RA208 + short windscreen*	*90° Ra0208 + integral windscreen*	Incertitude uncertainty (dB)
63 Hz	-10,2	-10,0	-10,1	-10,1	0,45
125 Hz	-4,9	-4,8	-4,9	-4,8	0,45
250 Hz	-1,9	-1,8	-2,0	-2,0	0,29
500 Hz	-0,7	-0,7	-0,9	-0,8	0,29
1000 Hz	-0,4	-0,4	-0,4	-0,4	0,29
2000 Hz	0,0	0,0	0,0	-0,2	0,29
4000 Hz	-1,0	-0,6	-0,4	-0,8	0,39
8000 Hz	-3,7	-4,6	-4,1	-4,2	0,61
16000 Hz	-14,4	-16,4	-20,4	-20,1	0,61
C	*0° Short windscreen*	*0° RA0208 + integral windscreen*	*90° RA208 + short windscreen*	*90° Ra0208 + integral windscreen*	Incertitude uncertainty (dB)
63 Hz	-1,6	-1,5	-1,6	-1,5	0,45
125 Hz	-0,8	-0,7	-0,8	-0,8	0,45
250 Hz	-0,6	-0,5	-0,7	-0,6	0,29
500 Hz	-0,4	-0,4	-0,6	-0,5	0,29
1000 Hz	-0,4	-0,4	-0,4	-0,4	0,29
2000 Hz	-0,1	-0,1	-0,1	-0,2	0,29
4000 Hz	-1,1	-0,7	-0,5	-0,9	0,39
8000 Hz	-3,8	-4,7	-4,2	-4,3	0,61
16000 Hz	-14,5	-16,5	-20,5	-20,3	0,61

Linéarité
Linearity

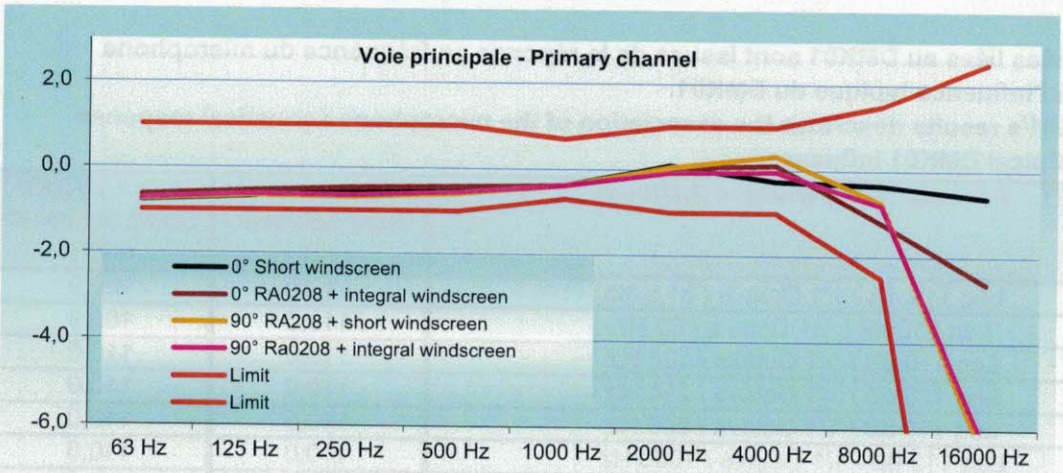
Linéatité (voie principale) *Linearity (Primary channel)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 35 dBZ / 8000 Hz	35,0	35,0	0,2
Leq 40 dBZ / 8000 Hz	40,0	40,0	0,2
Leq 50 dBZ / 8000 Hz	50,0	50,0	0,2
Leq 60 dBZ / 8000 Hz	60,0	60,0	0,2
Leq 70 dBZ / 8000 Hz	70,0	70,0	0,2
Leq 80 dBZ / 8000 Hz	80,0	80,1	0,2
Leq 90 dBZ / 8000 Hz	90,0	90,0	0,2
Leq 100 dBZ / 8000 Hz	100,0	100,0	0,2
Leq 110 dBZ / 8000 Hz	110,0	109,9	0,2
Leq 120 dBZ / 8000 Hz	120,0	119,8	0,2
Leq 130 dBZ / 8000 Hz	130,0	129,9	0,2
Leq 134 dBZ / 8000 Hz	134,0	133,9	0,2
Leq 134 dBA / 8000 Hz	134,0	133,8	0,2
Leq 130 dBA / 8000 Hz	130,0	129,8	0,2
Leq 120 dBA / 8000 Hz	120,0	119,8	0,2
Leq 110 dBA / 8000 Hz	110,0	109,9	0,2
Leq 100 dBA / 8000 Hz	100,0	100,0	0,2
Leq 90 dBA / 8000 Hz	90,0	90,0	0,2
Leq 80 dBA / 8000 Hz	80,0	80,0	0,2
Leq 70 dBA / 8000 Hz	70,0	70,0	0,2
Leq 60 dBA / 8000 Hz	60,0	60,0	0,2
Leq 50 dBA / 8000 Hz	50,0	50,0	0,2
Leq 40 dBA / 8000 Hz	40,0	40,0	0,2
Leq 30 dBA / 8000 Hz	30,0	29,9	0,2
Leq 26 dBA / 8000 Hz	26,0	26,0	0,2

Filtre
Filter

Filtre par bande d'octave (Voie principale) *Octave filter (primary channel)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 110 dB / 1/1 Octave / 31,5 Hz	110,0	109,9	0,5
Leq 110 dB / 1/1 Octave / 63 Hz	110,0	109,9	0,5
Leq 110 dB / 1/1 Octave / 125 Hz	110,0	110,0	0,5
Leq 110 dB / 1/1 Octave / 250 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 500 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 1000 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 2000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/1 Octave / 4000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/1 Octave / 8000 Hz	110,0	110,0	0,4

Filtre tiers d'octave (Voie principale) *Third octave filter (Primary channel)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 110 dB / 1/3 Octave / 25 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 31,5 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 40 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 50 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 63 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 80 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 100 Hz	110,0	109,9	0,5
Leq 110 dB / 1/3 Octave / 125 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 160 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 200 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 250 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 315 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 400 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 500 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 630 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 800 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 1000 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 1250 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 1600 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 2000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 2500 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 3150 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 4000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 5000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 6300 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 8000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 10000 Hz	110,0	110,0	0,6

Réponse acoustique
Acoustic response



OPTION DMK 01 (1/3)

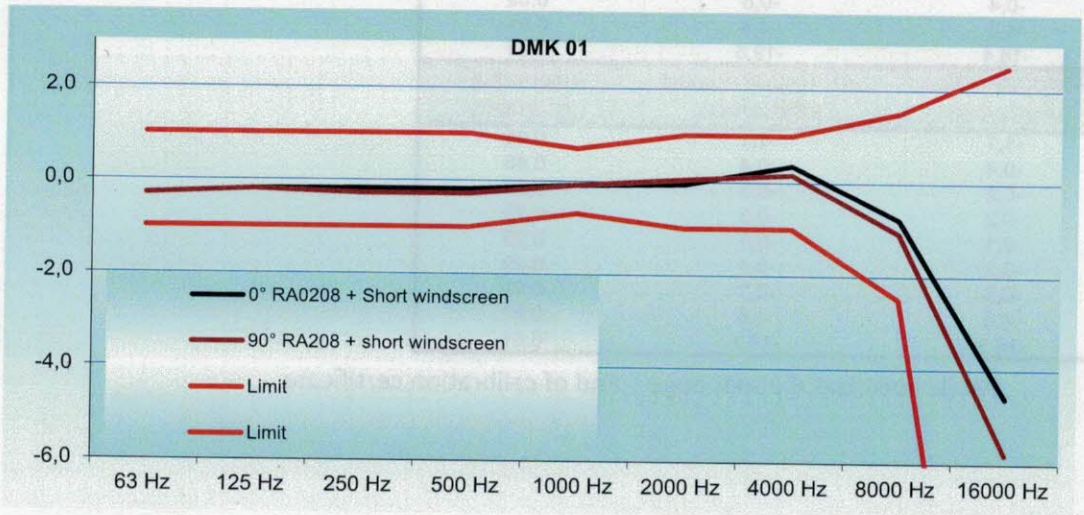
Les données liées au DMK01 sont issues de la réponse en fréquence du microphone associé à l'influence typique du DMK01.
The DMK01's results describes the association of the microphone acoustical response with the tipical DMK01 influence.

Filtre par bande d'octave (DMK 01) *Octave filter (with DMK01)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 110 dB / 1/1 Octave / 31,5 Hz	110,0	109,9	0,5
Leq 110 dB / 1/1 Octave / 63 Hz	110,0	109,9	0,5
Leq 110 dB / 1/1 Octave / 125 Hz	110,0	110,0	0,5
Leq 110 dB / 1/1 Octave / 250 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 500 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 1000 Hz	110,0	110,0	0,3
Leq 110 dB / 1/1 Octave / 2000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/1 Octave / 4000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/1 Octave / 8000 Hz	110,0	110,0	0,4

Filtre tiers d'octave (DMK 01) *Third octave filter (with DMK01)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 110 dB / 1/3 Octave / 25 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 31,5 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 40 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 50 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 63 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 80 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 100 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 125 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 160 Hz	110,0	110,0	0,5
Leq 110 dB / 1/3 Octave / 200 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 250 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 315 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 400 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 500 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 630 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 800 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 1000 Hz	110,0	110,0	0,3
Leq 110 dB / 1/3 Octave / 1250 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 1600 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 2000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 2500 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 3150 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 4000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 5000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 6300 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 8000 Hz	110,0	110,0	0,4
Leq 110 dB / 1/3 Octave / 10000 Hz	110,0	110,0	0,6

OPTION DMK 01 (2/3)

Linéatité (avec DMK01) *Linearity (with DMK01)*	Valeur nominale *Nominal value* (dB)	Valeur affichée *Displayed value* (dB)	Incertitudes *Uncertainty* (dB)
Leq 35 dBZ / 8000 Hz	35,0	35,1	0,2
Leq 40 dBZ / 8000 Hz	40,0	40,0	0,2
Leq 50 dBZ / 8000 Hz	50,0	50,0	0,2
Leq 60 dBZ / 8000 Hz	60,0	60,0	0,2
Leq 70 dBZ / 8000 Hz	70,0	70,0	0,2
Leq 80 dBZ / 8000 Hz	80,0	80,0	0,2
Leq 90 dBZ / 8000 Hz	90,0	90,0	0,2
Leq 100 dBZ / 8000 Hz	100,0	100,0	0,2
Leq 110 dBZ / 8000 Hz	110,0	110,0	0,2
Leq 120 dBZ / 8000 Hz	120,0	119,8	0,2
Leq 130 dBZ / 8000 Hz	130,0	129,8	0,2
Leq 134 dBZ / 8000 Hz	134,0	133,8	0,2
Leq 134 dBA / 8000 Hz	134,0	133,8	0,2
Leq 130 dBA / 8000 Hz	130,0	129,8	0,2
Leq 120 dBA / 8000 Hz	120,0	119,8	0,2
Leq 110 dBA / 8000 Hz	110,0	109,9	0,2
Leq 100 dBA / 8000 Hz	100,0	100,0	0,2
Leq 90 dBA / 8000 Hz	90,0	90,0	0,2
Leq 80 dBA / 8000 Hz	80,0	80,0	0,2
Leq 70 dBA / 8000 Hz	70,0	70,0	0,2
Leq 60 dBA / 8000 Hz	60,0	60,0	0,2
Leq 50 dBA / 8000 Hz	50,0	50,0	0,2
Leq 40 dBA / 8000 Hz	40,0	40,0	0,2
Leq 30 dBA / 8000 Hz	30,0	30,0	0,2
Leq 26 dBA / 8000 Hz	26,0	26,1	0,2



OPTION DMK 01 (3/3)

Pondération fréquentielle (avec DMK01) Frequency weighting (with DMK01)			
Z	*0° RA0208 + Short windscreen*	*90° RA208 + short windscreen*	Incertitude uncertainty
63 Hz	-0,3	-0,3	0,45
125 Hz	-0,2	-0,2	0,45
250 Hz	-0,2	-0,3	0,29
500 Hz	-0,2	-0,3	0,29
1000 Hz	-0,1	-0,1	0,29
2000 Hz	0,0	0,1	0,29
4000 Hz	0,4	0,2	0,39
8000 Hz	-0,8	-1,1	0,61
16000 Hz	-4,6	-5,8	0,61
A	*0° RA0208 + Short windscreen*	*90° RA208 + short windscreen*	Incertitude uncertainty
63 Hz	-26,6	-26,6	0,45
125 Hz	-16,4	-16,4	0,45
250 Hz	-8,9	-9,0	0,29
500 Hz	-3,4	-3,5	0,29
1000 Hz	-0,1	-0,1	0,29
2000 Hz	1,2	1,3	0,29
4000 Hz	1,3	1,1	0,39
8000 Hz	-2,4	-2,7	0,61
16000 Hz	-16,6	-17,8	0,61
B	*0° RA0208 + Short windscreen*	*90° RA208 + short windscreen*	Incertitude uncertainty
63 Hz	-9,7	-9,7	0,45
125 Hz	-4,4	-4,4	0,45
250 Hz	-1,5	-1,6	0,29
500 Hz	-0,5	-0,6	0,29
1000 Hz	-0,1	-0,1	0,29
2000 Hz	-0,1	0,0	0,29
4000 Hz	-0,4	-0,6	0,39
8000 Hz	-4,2	-4,5	0,61
16000 Hz	-18,4	-19,6	0,61
C	*0° RA0208 + Short windscreen*	*90° RA208 + short windscreen*	Incertitude uncertainty
63 Hz	-1,1	-1,1	0,45
125 Hz	-0,4	-0,4	0,45
250 Hz	-0,2	-0,3	0,29
500 Hz	-0,2	-0,3	0,29
1000 Hz	-0,1	-0,1	0,29
2000 Hz	-0,2	-0,1	0,29
4000 Hz	-0,5	-0,7	0,39
8000 Hz	-4,3	-4,6	0,61
16000 Hz	-18,5	-19,7	0,61

Fin du certificat d'étalonnage End of calibration certificate

Chapitre 3.

CERTIFICAT DE CONFORMITE

CONFORMITY CERTIFICATE

CC-DTE-L-17-PVE-47775

Nous, fabricant
We, manufacturer

Acoem
200, Chemin des Ormeaux
F 69578 LIMONEST Cedex- FRANCE

déclarons sous notre seule responsabilité que le produit suivant :
declare under our own responsibility that the following equipment:

Désignation :
Designation:
Sonomètre Intégrateur Moyenneur
Integrating-Averaging Sound level meter

Référence :
Reference:
DUO

Numéro de série :
Serial Number:
12373

est conforme aux dispositions des normes suivantes :
complies with the requirements of the following standards:

	Norme *Standard*	Classe *Class*	Edition du *Edition of*
Sonomètre :	IEC 60651	1	10-2000
Sound level meter :	IEC 60804	1	10-2000
	IEC 61672-1	1	09-2013
	IEC 61260	1	07-1995-2011
	ANSI S1.11	1	2004
	ANSI S1.4	1	1983-1985

et répond en tout point, après vérification et essais, aux exigences spécifiées, aux normes et règlements applicables, sauf exceptions, réserves ou dérogations énumérées dans la présente déclaration de conformité.

After testing and verification, this device satisfies all specified requirements and applicable standards and regulations apart from exceptions, reservations, or exemptions listed in this conformance certificate.

Date
Date
17/03/2017

LE REFERENT METROLOGIE ACOUSTIQUE
PAR DELEGATION
THE REFERENT ACOUSTIC METROLOGY
Bertrand LEROY

[redacted]

Calibration Certificates for Position N2 – June/July 2018 Survey

Certificate of Calibration

Issued by University of Salford (Acoustics Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

APPROVED SIGNATORIES
Claire Lomax [x] Andy Moorhouse [ ]
Gary Phillips [ ] Danny McCaul [ ]

acoustic calibration laboratory
The University of Salford, Salford, Greater Manchester, M5 4WT, UK
http://www.acoustics.salford.ac.uk
t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk

UKAS CALIBRATION
0801

University of Salford MANCHESTER

Certificate Number: 03764/4 Date of Issue: 3 May 2018

PERIODIC TEST OF A SOUND LEVEL METER to IEC 61672-3:2006

FOR:	Acoustic 1 The Barns Overdale Manordeilo Llandeilo Carmarthenshire SA19 7BD
FOR THE ATTENTION OF:	Steve Thomas
PERIODIC TEST DATE:	02/05/2018
TEST PROCEDURE:	CTP12 (Laboratory Manual)

Sound Level Meter Details

Manufacturer	01dB	
Model	DUO	
Serial number	10515	
Class	1	
Hardware version	LIS1005G	Application FW: 2.40. Metrology FW: 2.12

Associated Items	**Microphone**	**Preamplifier**
Manu	GRAS	01dB
Model	40CD	PRE22
Serial Number	136819	10126

Test Engineer (initial): GP Name: Gary Phillips

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 the 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.

Certificate Number: 03764/4 Date of Issue: 3 May 2018

Procedures from IEC 61672-3: 2006 and TPS 49 Edition 2 June 2009 were used to perform the periodic tests. The manufacturer's instruction manual was marked as follows: DOC1112 June 2014 G - DUO User Manual GB. Adjustment data used to adjust the sound levels indicated in response to the application of a multi-frequency sound calibrator to sound levels equivalent to those that would be indicated in response to plane, progressive sound waves were obtained from the manufacturer. The sound level meter calibration check frequency is 1000 Hz; the reference sound pressure level is 94 dB. As this instrument only has a single range, this range is the reference level range.

The environmental conditions in the laboratory at the start of the test were:
Static pressure 99.805 kPa ± 0.022 kPa; air temperature 23.1 °C ± 0.3 °C; relative humidity 38.0 % ± 1.8 %.

The initial response of the instrument to application of the suitable laboratory sound calibrator was 93.4 dB (C). The instrument was then adjusted to indicate 93.8 dB (C). This indication was obtained from the calibration certificate of the calibrator and information in the manufacturer's instruction manual specified in this certificate, when the instrument is configured for use with the external input, using the DMK01 weatherproof outdoor microphone unit, supplied RAL135-5M microphone extension cable and the following instrument settings; Microphone input: External, Microphone type: 40CD, Reference direction: 90°, High-pass filter: 10 Hz, Nose cone: Yes.

With the microphone replaced by an electrical input device with a similar capacitance to that of the electrical input device specified by the manufacturer, the levels of self-generated noise were:

A: 12.7 dB*
B: 12.2 dB*
C: 13.6 dB*
Z: 19.1 dB*

* Under-range indicated on instrument display.

The environmental conditions in the laboratory at the end of the test were:
Static pressure 99.981 kPa ± 0.022 kPa; air temperature 22.3 °C ± 0.3 °C; relative humidity 45.1 % ± 1.8 %.

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 organization 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.

Certificate Number: 03764/4 Date of Issue: 3 May 2018

The instrument failed to meet the requirements for the test of electrical signal tests of frequency weightings at 250 Hz, 500 Hz and 1 kHz for the A, B, C and Z-weightings, as the uncertainty of measurement exceeded the maximum permitted value due to a significant contribution from data supplied by the manufacturer. If the manufacturer's uncertainty data were not included, the meter would meet the requirements of the Standard.

As the actual frequency response of the microphone was unavailable, the typical frequency response for the model of microphone has been used to correct the level differences determined in the electrical signal test of frequency weighting.

Instruments used in the verification procedure were traceable to *National Standards*. The multi-frequency calibrator method was employed in the acoustical tests of a frequency weighting.

The uncertainty evaluation has been carried out in accordance with UKAS requirements. All measurement results are retained at the acoustic calibration laboratory for at least four years.

Calibration Certificates for Position N4 – June/July 2018 Survey

Certificate of Calibration

Issued by University of Salford (Acoustics Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

APPROVED SIGNATORIES
Claire Lomax [x] Andy Moorhouse [ ]
Gary Phillips [ ] Danny McCaul [ ]

[redacted]

acoustic calibration laboratory
The University of Salford, Salford, Greater Manchester, M5 4WT, UK
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UKAS CALIBRATION 0801

University of Salford MANCHESTER

Certificate Number: 03169/3 Date of Issue: 12 April 2017

PERIODIC TEST OF A SOUND LEVEL METER to IEC 61672-3:2006

FOR:	Acoustic 1 The Barns Overdale Manordeilo Llandeilo Carmarthenshire SA19 7BD
FOR THE ATTENTION OF:	Steve Thomas
PERIODIC TEST DATE:	12/04/2017
TEST PROCEDURE:	CTP12 (Laboratory Manual)

Sound Level Meter Details

Manufacturer	01dB	
Model	CUBE	
Serial number	10692	
Class	1	
Hardware version	LIS001A	Application FW: 2.38, Metrology FW: 2.12

Associated Items	**Microphone**	**Preamplifier**
Manu	GRAS	01dB
Model	40CD	PRE22
Serial Number	224253	10755

Test Engineer (initial): GP Name: Gary Phillips

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 the 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.

Certificate Number: 03169/3 Date of Issue: 12 April 2017

Procedures from IEC 61672-3: 2006 and TPS 49 Edition 2 June 2009 were used to perform the periodic tests. The manufacturer's instruction manual was marked as follows: DOC1144 June 2014 G - CUBE User Manual GB. Adjustment data used to adjust the sound levels indicated in response to the application of a multi-frequency sound calibrator to sound levels equivalent to those that would be indicated in response to plane, progressive sound waves were obtained from the manufacturer. The sound level meter calibration check frequency is 1000 Hz, the reference sound pressure level is 94 dB. As this instrument only has a single range, this range is the reference level range.

The environmental conditions in the laboratory at the start of the test were:
Static pressure 101.192 kPa ± 0.017 kPa, air temperature 22.5 °C ± 0.3 °C, relative humidity 39.0 % ± 1.9%.

The initial response of the instrument to application of the suitable laboratory sound calibrator was 93.5 dB (C). The instrument was then adjusted to indicate 93.7 dB (C). This indication was obtained from the calibration certificate of the calibrator and information in the manufacturer's instruction manual specified in this certificate, when the instrument is configured for use with the external input, using the DMK01 weatherproof outdoor microphone unit, supplied RAL135-5m microphone extension cable and the following instrument settings; Microphone input: External, Microphone type: 40CD, Reference direction: 90°, High-pass filter: 10 Hz, Nose cone: Yes.

With the microphone replaced by an electrical input device with a similar capacitance to that of the electrical input device specified in the manufacturer's instruction manual, the levels of self-generated noise were:

A: 12.9 dB*
B: 12.3 dB*
C: 13.6 dB*
Z: 19.8 dB*

* Under-range indicated on instrument display.

The environmental conditions in the laboratory at the end of the test were:
Static pressure 101.159 kPa ± 0.017 kPa, air temperature 23.6 °C ± 0.3 °C, relative humidity 39.0 % ± 1.9%.

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. However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Certificate Number: 03169/3 Date of Issue: 12 April 2017

As the actual frequency response of the microphone was unavailable, the typical frequency response for the model of microphone has been used to correct the level differences determined in the electrical signal test of frequency weighting.

The instrument failed to meet the requirements for the test of electrical signal tests of frequency weightings at 250 Hz, 500 Hz and 1 kHz for the A, B, C and Z-weightings, as the uncertainty of measurement exceeded the maximum permitted value due to a significant contribution from data supplied by the manufacturer. If the manufacturer's uncertainty data were not included, the meter would meet the requirements of the Standard.

Instruments used in the verification procedure were traceable to *National Standards*. The multi-frequency calibrator method was employed in the acoustical tests of a frequency weighting.

The uncertainty evaluation has been carried out in accordance with UKAS requirements. All measurement results are retained at the acoustic calibration laboratory for at least four years.

Calibration Certificates for Position N5 – June/July 2018 Survey

Certificate of Calibration

Issued by University of Salford (Acoustics Calibration Laboratory)
UKAS ACCREDITED CALIBRATION LABORATORY NO. 0801

APPROVED SIGNATORIES
Claire Lomax [x] Andy Moorhouse [ ]
Gary Phillips [ ] Danny McCaul [ ]

acoustic calibration laboratory
The University of Salford, Salford, Greater Manchester, M5 4WT, UK
http://www.acoustics.salford.ac.uk
t 0161 295 3030/0161 295 3319 f 0161 295 4456 e c.lomax1@salford.ac.uk

UKAS CALIBRATION 0801

University of Salford MANCHESTER

Certificate Number: 03348/1 Date of Issue: 18 July 2017

PERIODIC TEST OF A SOUND LEVEL METER to IEC 61672-3:2006

FOR:	Acoustic 1 The Barns Overdale Manordeilo Llandeilo Carmarthenshire, SA19 7BD
FOR THE ATTENTION OF:	Steve Thomas
PERIODIC TEST DATE:	17th and 18th July 2017
TEST PROCEDURE:	CTP12 (Laboratory Manual)

Sound Level Meter Details

Manufacturer	01dB
Model	CUBE
Serial number	10414
Class	1
Hardware version: LIS001B	Application FW: 2.35. Metrology FW: 2.12

Associated Items	**Microphone**	**Preamplifier**
Manu	GRAS	01dB
Model	40CD	PRE22
Serial Number	144941	10644

Test Engineer (initial): GP Name: Gary Phillips

Certificate Number: 03348/1 Date of Issue: 18 July 2017

Procedures from IEC 61672-3: 2006 and TPS 49 Edition 2 June 2009 were used to perform the periodic tests.

The manufacturer's instruction manual was marked as follows: DOC1144 June 2014 G - CUBE User Manual GB. Adjustment data used to adjust the sound levels indicated in response to the application of a multi-frequency sound calibrator to sound levels equivalent to those that would be indicated in response to plane, progressive sound waves were obtained from the manufacturer. The sound level meter calibration check frequency is 1000 Hz, the reference sound pressure level is 94 dB. As this instrument only has a single range, this range is the reference level range.

The environmental conditions in the laboratory at the start of the test were:
Static pressure 101.838 kPa ± 0.017 kPa, air temperature 21.8 °C ± 0.3 °C, relative humidity 49.3 % ± 1.9%.

The initial response of the instrument to application of the suitable laboratory sound calibrator was 93.7 dB (C). No adjustment of the instrument was required. This indication was obtained from the calibration certificate of the calibrator and information in the manufacturer's instruction manual specified in this certificate, when the instrument is configured for use with the external input, using the DMK01 weatherproof outdoor microphone unit, supplied RAL135-10 microphone extension cable and the following instrument settings; Microphone input: External, Microphone type: 40CD, Reference direction: 90°, High-pass filter: 10 Hz, Nose cone: Yes.

With the microphone replaced by an electrical input device with a similar capacitance to that of the electrical input device specified in the manufacturer's instruction manual, the levels of self-generated noise were:

A: 13.1 dB*
B: 13.0 dB*
C: 15.2 dB*
Z: 20.2 dB*

* Under-range indicated on instrument display.

The environmental conditions in the laboratory at the end of the test were:
Static pressure 101.458 kPa ± 0.017 kPa, air temperature 21.9 °C ± 0.3 °C, relative humidity 58.2 % ± 1.9%.

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. However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2002 because evidence was not publicly available, from an independent testing organization responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2002, and because the periodic tests of IEC 61672-3:2006 cover only a limited subset of the specifications in IEC 61672-1:2002.

Certificate Number: 03348/1 Date of Issue: 18 July 2017

As the actual frequency response of the microphone was unavailable, the typical frequency response for the model of microphone has been used to correct the level differences determined in the electrical signal test of frequency weighting.

The instrument failed to meet the requirements for the test of electrical signal tests of frequency weightings at 250 Hz, 500 Hz and 1 kHz for the A, B, C and Z-weightings, as the uncertainty of measurement exceeded the maximum permitted value due to a significant contribution from data supplied by the manufacturer. If the manufacturer's uncertainty data were not included, the meter would meet the requirements of the Standard.

Instruments used in the verification procedure were traceable to *National Standards*. The multi-frequency calibrator method was employed in the acoustical tests of a frequency weighting.

The uncertainty evaluation has been carried out in accordance with UKAS requirements. All measurement results are retained at the acoustic calibration laboratory for at least four years.