

Loch Kemp Storage - EIA Report

Appendix 17.4: Source Noise Data during Operation

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Operating Equipment Sound Power Levels - Loch Kemp Pump Storage



Revision	Date	Comment
0	03/10/2022	Initial
1	03/09/2023	Transformers in powerhouse building. Switching Station separated out

Equipment or Source	Octave Band Sound Power Level, Lw (Linear)								Overall LwA (dB)	Frequency shaping (L/M/H)	Point (P) Line (L) Area (A)	Length (m) / Area (m ²)	Distance from alc (m) (if point or line source)	Directivity Index (dB) (if point or line source)	Average Lp at meas. surface	% On-time	No. off	Corrected overall LwA (dB)	Comments
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz											
Powerhouse roof (from internal sources)	99	96	95	87	79	70	63	61	89	A	3200			54	100	1	54 LwA/m2	See notes 1) and 2) below	
Powerhouse walls (from internal sources)	100	97	96	88	80	71	64	62	90	A	3400			55	100	1	55 LwA/m2	See notes 1) and 2) below	
Main transformer (located within powerhouse building)	104	104	102	94	89	89	84	79	98	P					100	2	101 LwA	See note 3)	
Auxiliary transformer (located within powerhouse building)	99	99	97	89	84	84	79	74	93	P					100	2	96 LwA	See note 4)	
Control room ventilation apertures	85	85	80	78	75	68	65	62	80	P					100	5	87 LwA	See note 5)	
Workshop ventilation	95	95	90	88	85	78	75	72	90	P					100	2	93 LwA	See note 5)	
Electrical substation	97	97	95	87	82	82	82	77	92	P					100	1	92 LwA	See note 6). Considered as Associated Development	
Notes																			
1) Sound pressure level inside powerhouse	83	86	87	83	80	78	76	74	86										Octave band sound pressure level spectrum in powerhouse approximately equivalent to 86dBA
2) Sound insulation R powerhouse cladding	16	22	24	28	33	40	45	45											This is typical R values in each octave band for a propriety wall or roof cladding system enhanced to have a medium sound insulation characteristic of Rw = 34 dB. Ventilation apertures will be attenuated as required so as not to significantly degrade the overall powerhouse insulation.
3) Noise data for main transformer, Lw	104	104	102	94	89	89	84	79	98										Taken from typical vendor data for this type of large 175 MVA transformer
4) Noise data for auxiliary transformer, Lw	99	99	97	89	84	84	79	74	93										Significantly smaller than main transformer.
5) Noise data for typical ventilation systems	86	83	78	75	70	70	65	62	78										Generic from database of site data
6) Precautionary (high) noise level for Switching Station (normally less than this)	97	97	95	87	82	82	77	72	91										Generic from database of site data. LpA at 15m from centre of typical substation - 60 dBA (Switching Station will be substantially quieter than this in practice, (around - 8/15 dBA), as no transformers which are the loudest source. The cautious (high) values is assumed in the modelling.