

Oil & Gas - Compression

Site Wide Acoustic Performance Guarantee



PROJECT: FELINDRE COMPRESSOR STATION
CLIENT: NATIONAL GRID
LOCATION: FELINDRE, WALES, UK



PROJECT DESCRIPTION

The Felindre Compressor Station maintains the pressure in the Felindre to Tirley 1,220mm diameter gas pipeline, transporting gas north from the Milford Haven to Aberdulais pipeline to join the existing National Gas Transmission System at Treadow in Herefordshire. The 15MW Solar Titan 130 gas turbine driving a centrifugal natural gas compressor required acoustic attenuation to achieve stringent noise criteria at 170m distance. INNOVA was responsible for the turn-key noise control solution. The noise control solution included a ventilated acoustic silencing building with maximum $R_w=57$ transmission loss performance, gas turbine intake and exhaust silencing and acoustic pipe lagging.

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SCOPE OF WORK

INNOVA designed, supplied and installed all noise control and provided a site-wide performance guarantee. Acoustic mitigation and other scope included:

- » Gas Compressor Building
- » Building Ventilation System
- » 2-stage Turbine Exhaust Silencing
- » 2-stage Turbine Inlet Silencing
- » Equipment Acoustic Lagging
- » Structural Support Steelwork

ACOUSTICAL REQUIREMENTS

In accordance with development permit, the noise guarantee was provided by INNOVA, comprising $L_{eq} = 37\text{dB(A)}$ (re $20\mu\text{Pa}$) and 65dB in the 31.5Hz octave band at a location 170m west of the plant fence line, at Llety Morfil Farm.

NOISE SOURCES

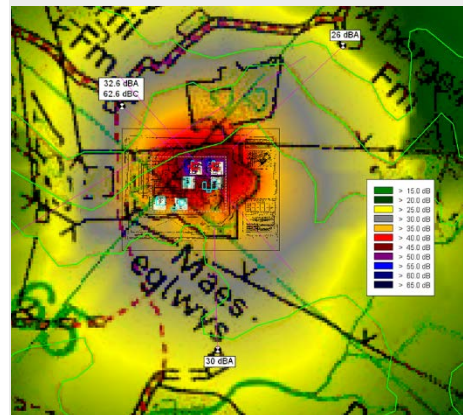
The principal noise sources (L_w) for the compressor station were:

- » 2x Solar Titan 130 turbocompressors – 123 dBA ea.
- » Compressor suction and discharge piping – 107 dBA
- » Turbine Exhaust – 140 dBA
- » Turbine Inlet – 158 dBA



Project Highlights:

- ▶ Noise guarantee achieved while providing effective ventilation and cooling of equipment.
- ▶ Zero lost-time injuries during construction.



For more information:

Please visit innova-gl.com or email us at info@innova-gl.com

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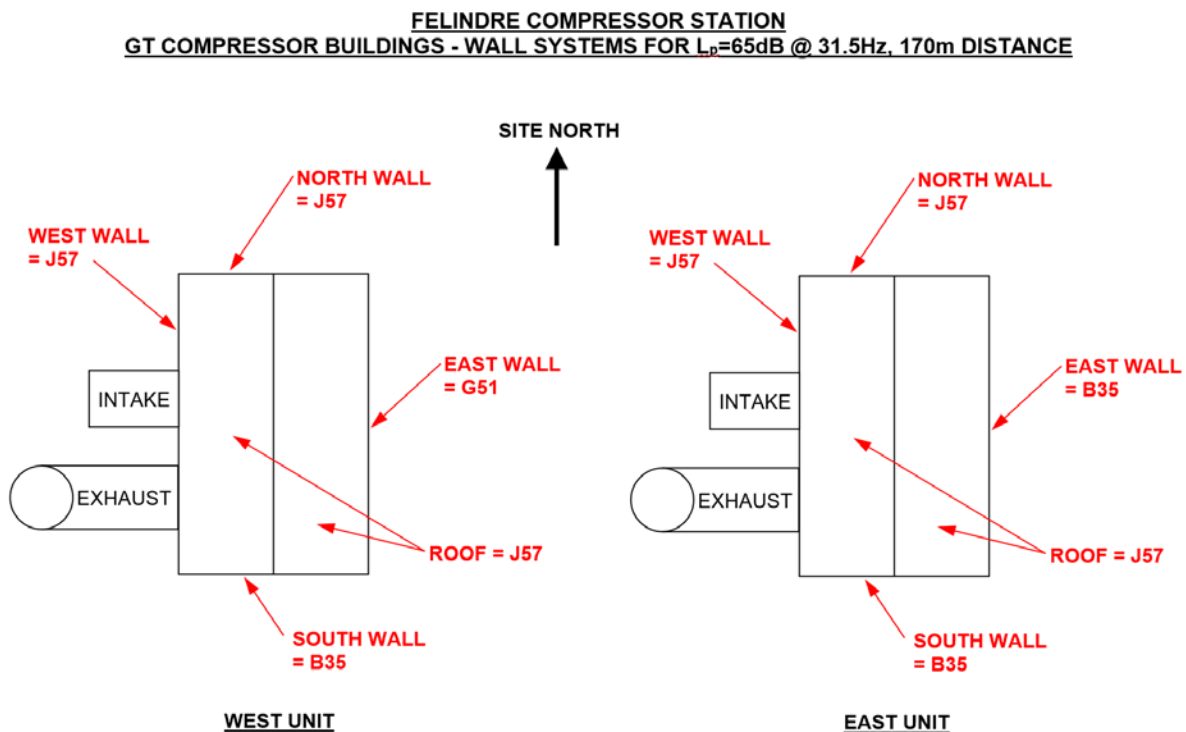


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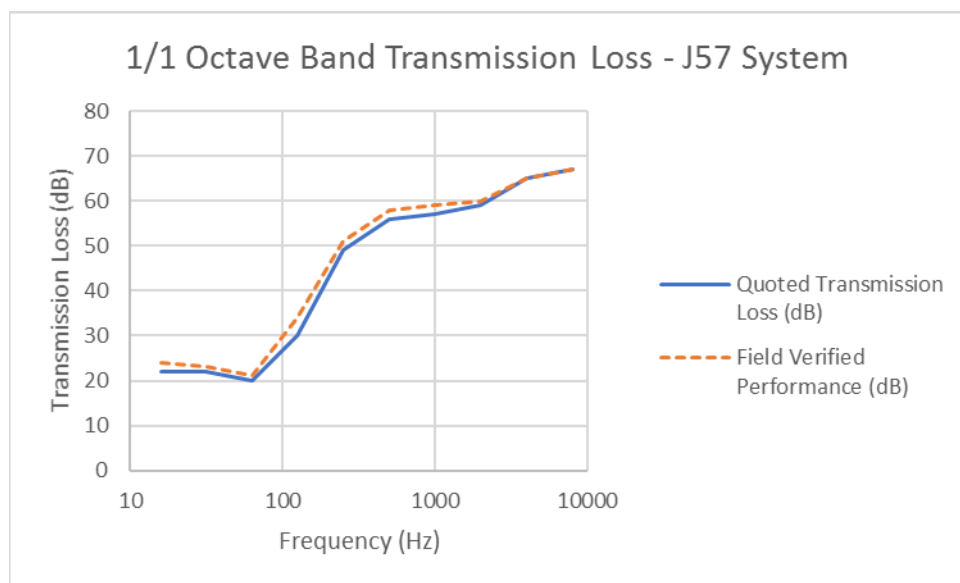
ACOUSTIC SOLUTION

INNOVA's acoustic solution considered all individual noise sources contributing to the overall sound pressure level at the receptor positions. By utilizing a Cadna/A noise model and tuning the design of each noise attenuation feature, the contribution from each was weighted between its project cost and performance. The directional nature of the critical receptor allowed INNOVA to balance the design with three high-performance building wall systems (INNOVA J57-G51-B35), ventilation silencing, two-stage gas turbine inlet and exhaust silencing and heavy acoustic lagging to achieve the required acoustic criteria. The highest performing wall systems were used on the building surfaces that faced the critical receptor location. This included the roof.



ACOUSTIC PERFORMANCE

Guaranteed sound pressure levels were achieved at the nominated receptor positions $L_{eq} = 37\text{dB(A)}$ (re $20\mu\text{Pa}$) and $L_{eq} = 65\text{dB}$ at 31.5Hz octave band at a location 170m west of the plant fence line. The compressor building wall/roof system performance for the J57 wall system is summarized as follows:



Wall System Transmission Loss	OBCF (Hz)										Rw
	16	31.5	63	125	250	500	1000	2000	4000	8000	
Quoted Transmission Loss (dB)	22	22	20	30	49	56	57	59	65	67	57
Field Verified Performance (dB) *	24	22	21	34	51	58	59	60	65	67	58

* Adjusted from raw measurement data to account for background sound, acoustic reflections, and surrounding compressor unit noise sources. Actual measurements recorded in the field are different to those reported in the table.