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**Cc:** [Airspace Protection](#)  
**Subject:** RE: Notice of Exhibition - Liverpool Range Wind Farm Modification (SSD-6696-Mod-1) [SEC=OFFICIAL]  
**Date:** Thursday, 13 October 2022 5:35:47 PM

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## **OFFICIAL**

Natasha

CASA has reviewed the Aviation Impact Assessment (AIA) (January 2022 version) by Aviation Projects for the proposed Liverpool Range Wind Farm near Coolah.

The proposed modified wind farm will comprise up to 220 wind turbines with a maximum tip height of 250 m Above Ground Level (AGL) or 1,347 m above Australian Height Datum (AHD), up to 14 wind monitoring towers with a maximum height of 169 m AGL and approximately 82 km of 330 kV transmission line with towers up to 55m AGL.

The AIA advises that the grid LSALT of 1,646 m AHD (5,400 ft AMSL) should be increased by 30 m (100 ft) to 5,500 ft AMSL to accommodate the Modified Project Wind Turbine Generators. From the Airservices Australia assessment of 24 September 2020 (AIA pages 27 and 28), it appears that Airservices can accommodate the LSALT change. However, a revised Airservices assessment is essential.

Aviation Impact Assessment section 3.8 *Rules of Flight* advises that aircraft are restricted to a height of 500ft above ground level (AGL) and 1,000ft at night. The turbines will reach a height of 250m (820ft) above ground level. While pilots are required to fly no lower than 500ft above the ground or any object on the ground, a pilot could be off track or at a low level due to weather, navigation difficulties, controllability issues etc. Pilots could be required to navigate around the project site in low cloud conditions. The charting of a wind farm is one mitigator but does not eliminate the risk of an aircraft colliding with a turbine or wind monitoring tower.

On 31 March 2017, CASA advised that, at 165m AGL, the Liverpool Range Wind Farm would not require aviation hazard lighting. However, the height of the turbines has increased significantly. CASA considers the proposed Liverpool Range Wind Farm will be a hazard to aviation safety, but the risks to aviation safety could be mitigated to some extent by the provision of obstacle lighting. CASA recommends that the wind farm is obstacle lit with medium intensity steady red lighting in accordance with the NASF Guideline D and section 9.31 of the CASA Part 139 (Aerodromes) Manual of Standards. The Defence assessment of 13 August 2020 advises: If CASA determines that obstacle lighting is to be provided, it should be compatible with persons using night vision devices. If LED lighting is proposed, the frequency range of the LED light emitted should be within the range of wavelengths 665 to 930 nanometres.

While international standards require, and the NASF guideline recommends 2,000 candela lighting intensity; CASA would accept 200 candela lighting intensity. If the lighting fails, it should fail in the 'on' condition until it can be rectified.

CASA is prepared to review a lighting plan that indicates which turbines are proposed to be lit, if requested. CASA only considers aviation safety and does not consider the effect of lighting on neighbours. However, CASA notes there are recommended treatments including measures such as baffling and Aircraft Detection Lighting Systems listed in Page 97 Table 12 Risk ID 5 ('Effect of obstacle lighting on neighbours') of the AIA. Also, Annexure 3-6 describes shielding in downward directions and intensity control. The Visual Impact Assessment Section 14.5 also describes mitigations to reduce the potential visual impact of obstacle lighting.

The AIA advises that the site is within the Defence Restricted Area R559B and within the Danger Area D538B and that low level military flight operations will 'need to be conducted in consideration of the Modified Project WTGs'. The implications of '*need to be conducted in consideration of the Modified Project WTGs*'; are a matter for Defence.

#### Aviation Impact Assessment (Section 11) Recommendations

CASA agrees with the recommendations at Section 11 starting on page 104 of the Aviation Impact Assessment; except for Recommendation 10 *Lighting of Turbines*.

Further to Recommendations 3 and 5, on commencement of the (vertical) construction of the first turbine, or a 169m high Wind Monitoring Tower if preceding the turbines, Airservices Australia should be requested to publish a NOTAM.

Further to Recommendation 11, the Wind Monitoring Towers in the order of 169m AGL must be marked to some extent, depending on the proximity to the surrounding turbines. CASA recommends marker balls on the upper guy wires and conspicuous colour on the upper frame as a minimum.

Further to Recommendation 12, the following Australian Standard could be considered regarding the overhead transmission lines:

AS 3891.2, Air navigation — Cables and their supporting structures — Marking and safety requirements, Part 2: Low-level aviation operations.

If the Wind Monitoring Towers are to be installed a significant duration before the turbines and are in a prominent position, then they should incorporate a medium intensity red obstacle light at night.

Regards

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