

MOTTATT
17 JUNI 2011



Rambøll Norge AS Trondheim
Postboks 9420 Sluppen
7493 TRONDHEIM
Norge

Vår saksbehandler
Line Maria Hammerlund

Vår dato
15.06.2011
Deres dato

Vår ref
11/02344
Deres ref.

Avinor - Maurneset vindkraftverk - avklaringer luftfart

Avinor har gjennomført en analyse av konsekvensene av Maurneset vindkraftverk på inn- og utflygingsprosedyrer til Sørkjosen Lufthavn.

Anlegget har ingen innvirkning på prosedyrene.

Med vennlig hilsen



Jan-Gunnar Pedersen

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AVINOR AS



Line Maria Hammerlund

Kopi: Arkiv (FKF Admin Arkiv)

Vedlegg: 1

PROCEDURE DOCUMENTATION





AIRAC:	20110922
Procedure:	Operational assessment
Aerodrome:	ENSR

Synopsis: Operational assessment of the impact caused by a wind turbine installation at Maurneset.

	Date:	User ID:
Completed:	20110603	CAMGB
Controlled:		

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2 Dataset

<p>Procedure design software:</p>	<p>GéoTITAN v2.11.1 / 3.01</p>
<p>Spot heights:</p>	<p>Spot heights extending 50 NM around the design aerodrome have been incorporated in the software templates.</p> <p>Spot heights are imported from the digital dataset N50 created by Statens Kartverk and is available through the Norwegian digital terrain project Norge Digitalt</p>
<p>Digital terrain model:</p>	<p>A 50 meter post spacing, square grid digital terrain model has been incorporated in the software templates. The data source is the Norwegian mapping authority's N50 2.0 digital chart database and includes height information from lakes, height contours and spot heights in N50.</p> <p>N50 was digitised partly through scanning and vectorisation of analogue charts in scale 1:50 000 and partly through photogrammetric stereo construction or through a combination of these methods.</p> <p>The average horizontal accuracy is 25 meters, with a confidence level of 90%. The average vertical accuracy is 5-6 meters with a maximum error of 30 meters, with a confidence level of 90%. Certain areas containing very steep terrain, slopes steeper than 1:1, may exceed the maximum value. These areas are located in Troms and Finnmark and are identified here.</p> <p>Vertical resolution is 1 meter based on mean sea level and terrain with no addition for vegetation. The DTM was produced in 2000-2001 with an integrity level better than 10⁻³</p> <p>Originally the DTM was produced in USGS DEM format but has been converted to CGX format to function within GéoTITAN.</p>



Procedure documentation



Aerodrome data:	All aerodrome data is directly imported from the ORBIT Database automatically upon site creation. All RWY characteristics and associated landing aids such as localizers, landing DME stations, and instrument landing systems are automatically imported and later verified through the software validation process. Only post successful verification is the imported data used for procedure design.
NAVAID data:	All navigation facilities not associated with the aerodrome is automatically imported from the ORBIT database and later verified through the software validation process. Only post successful verification is the imported data used for procedure design.
NRL data:	<p>The Norwegian aeronautical obstacle database is run by Statens Kartverk and has the responsibility for maintaining an accurate and up to date database of all man made obstacles in Norway which is not owned by the aerodrome.</p> <p>An aeronautical obstacle is by law defined as any building or construction, temporary or permanent, with a height above ground or water of 15 meters or more. Within populated areas the equivalent height is 30 meters.</p> <p>NRL data is imported on a monthly basis into the ORBIT database and is automatically imported into the GéoTITAN working site.</p> <p>The full law concerning NRL can be found at lovdata: Forskrift om rapportering og registrering av luftfartshindre (BSL E 2-1)</p>
AIP 2.10 obstacles:	All obstacles listed in section 2.10 of the Norwegian AIP are defined as obstacles owned by the local aerodrome. The responsibility for accurately updating and maintaining this list of obstacles resides with the airport manager. These obstacles are currently not part of the ORBIT database and have to be manually entered into the working site. Future plans involve flagging these obstacles as Avinor owned obstructions within the database for automatic importation.



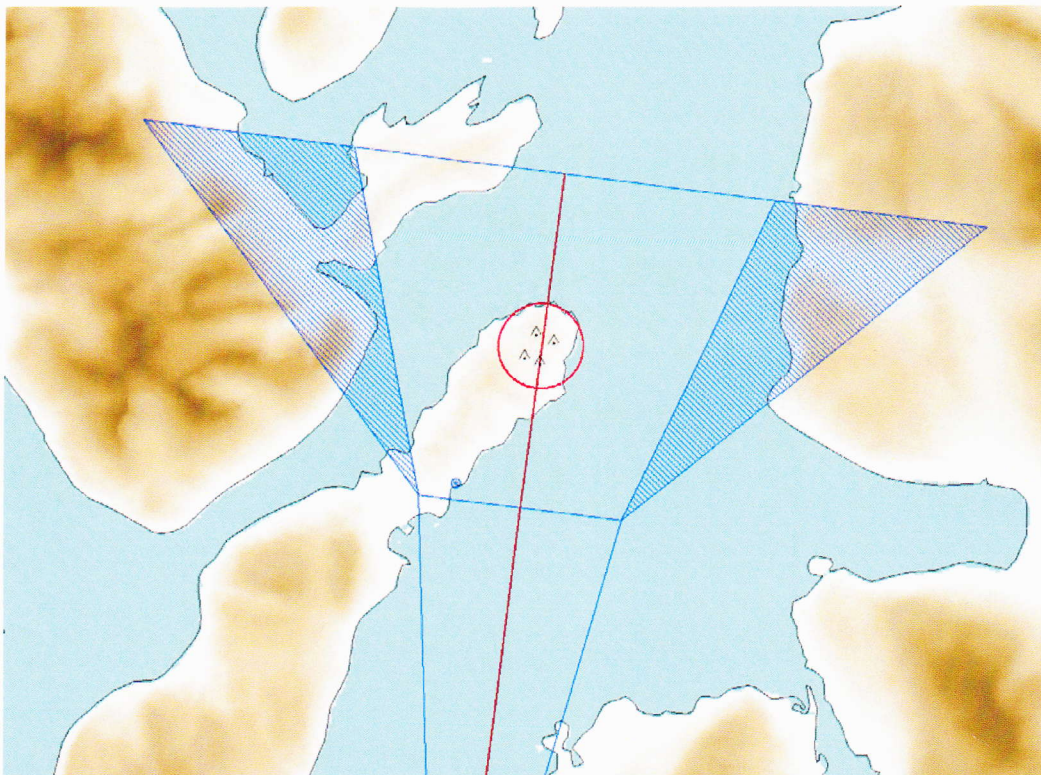
3 LOC-a



The wind turbine installation at Maurneset resides exactly on the inbound localizer course for the instrument approach procedure LOC-a at ENSR.

The maximum height of the tallest wind turbine is 265.m meters, which gives the following obstacle clearance altitude for a localizer procedure:

$$(265.5 + 75) \cdot 3.2808 = 1117.1124_{feet}$$

While the wind turbines are the most critical obstacles within the intermediate segment of the procedure, more critical obstacles reside in the final and missed approach segment. In addition, the procedure altitude overhead Hestvik NDB is 3190 FT, which renders the wind turbine installations insignificant.



	<p>Procedure documentation</p>	
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4 Conclusion

The wind turbine installation at Maurneset has no operational impact on existing instrument flight procedures at ENSR.

5 Version history

Date:	Version:	Comments:
20110603	1.0	Initial document draft