

Our latest primary surveillance Air
Traffic Control Radar update with
windfarm mitigation

The Watchman Radar

Air Traffic Control update

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Key facts

Safety Integrity Level 2 Air Traffic Control Radar

Automatic windfarm mitigation processing

Exploits technology transfer from military air defence radars

Improved radar performance in detection, accuracy and resolution

25 year life extension with simplified radar maintenance

Simple installation procedure



The Watchman radar update

The update will extend the service life by 25 years, address obsolescence and improve reliability and performance whilst assuring minimum operational downtime during installation.



Proven technology low risk

The updated hardware utilises core technology from the latest Royal Navy radars T997 (ARTISAN) and T1045 (Sampson) and that of the T102 (Commander SL) Air Defence radar.



Supporting renewable energy

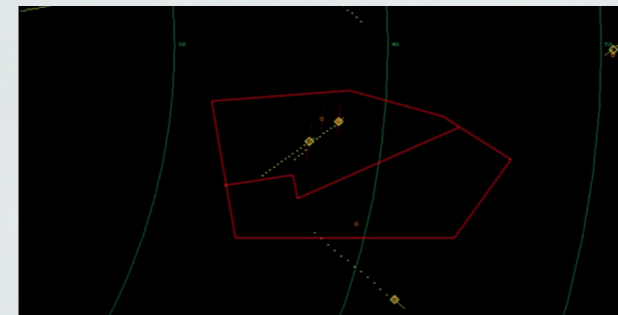
UK Government has a Renewable Energy Strategy to generate 15% of all the UK's energy from renewables from 2020.

Potential interference to Air Traffic Control radar remains a significant reason for planning consent to be stalled or withheld for onshore and offshore wind farms.

The Watchman radar update will deliver high performance even in the presence of wind farms.



Cowes-based Watchman reference radar performance against Rampian wind farm



Performance with complex clutter maps enabled. Two targets <3 nm separation, height 3000ft AMSL. Pd ≥ 90% no track drops or seduction

Benefits

System update incorporates technology insertion from military air defence radar products enabling high system stability supporting windfarm mitigation solution and delivering improved target detection, accuracies and resolution

Advanced signal processing architecture which automatically adapts to changing windfarm clutter environment, to maintain system performance

Simple upgrade installation which can be completed within ten days

25 year life extension removing all obsolescence issues maximising air picture availability 24/7

System parameters

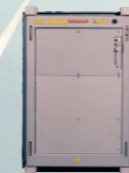
	Legacy	Update
Receiver dynamic range	40dB	69dB
Receiver stability	46dB	>68dB
Pulse compression sidelobes	38dB	55dB
Range cell	60m	30m
Processing bits	8 bit	32 bit
GCF cancellation	~40dB	>62dB
Beam switch range	19nm (typ)	Dual processed
CFAR	8 cell Log	16 cell Linear
Integrator	Marcos	Power sum
Plot and Track Extractor	Extra	Included
Driver Receiver LRU count	~50	~9
Signal Processing LRU count	~50	~5
Transmitter	TWT	Solid state



Current transmitter



Current signal processor



Current plot and track extractor

Cost effective update that extends the system life by 25 years and reduces the through life costs

- Technology insertion from military air defence products delivers common LRU solution supportable for next 25 years
- Advanced military air defence plot and track extractor
- Advanced signal processing architecture which automatically adapts to windfarm clutter
- Reduced installation footprint c.50% less space
- Modern solid state transmitter with graceful degradation
- Improved reliability and simpler maintainability delivering through life cost savings
- Air cooled
- Advance BITE with remote control operation



New improved transmitter



New improved signal processor, plot and track extractor

Watchman update key parameters

Operational features

- _____ S-Band (NATO E/F Band)
- _____ ATC System
- _____ Solid State Tx Modules
- _____ Graceful Degradation
- _____ Windfarm Mitigation
- _____ 4G Mitigated
- _____ Frequency Agile
- _____ Air cooled
- _____ Fully automatic detection and tracking
- _____ Safety Integrity Level 2
- _____ Land and Surface Target Tracking
- _____ Advanced BITE

System parameters

Frequency	2.75 – 3.05GHz
Rotation rate	15rpm
Instrumented range	0.5nmi to 80nmi
MTBCF	5461hrs
MTTR	25mins

Performance data (update) vs (legacy) comparison

Range accuracy	49.5meters rms	vs	80m rms
Azimuth accuracy	0.15° rms	vs	0.16° rms
Target resolution	90 meters	vs	120meters
Azimuth resolution	2.4 degrees	vs	2.6 degrees
Instrumented range	0.5nmi to 80nmi	vs	0.25nmi to 60nmi

Equipment installation

Equipment	Height	Width	Depth	Power	Input air cooling
Transmitter cabinet	1.75m	0.73m	0.80m	400v 17A per Phase 3 phase 230v 3A 1 phase	20°C+/-2°C
Drive receiver signal processing cabinet	1.58m	0.69m	0.65m	355kg	20°C+/-2°C

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