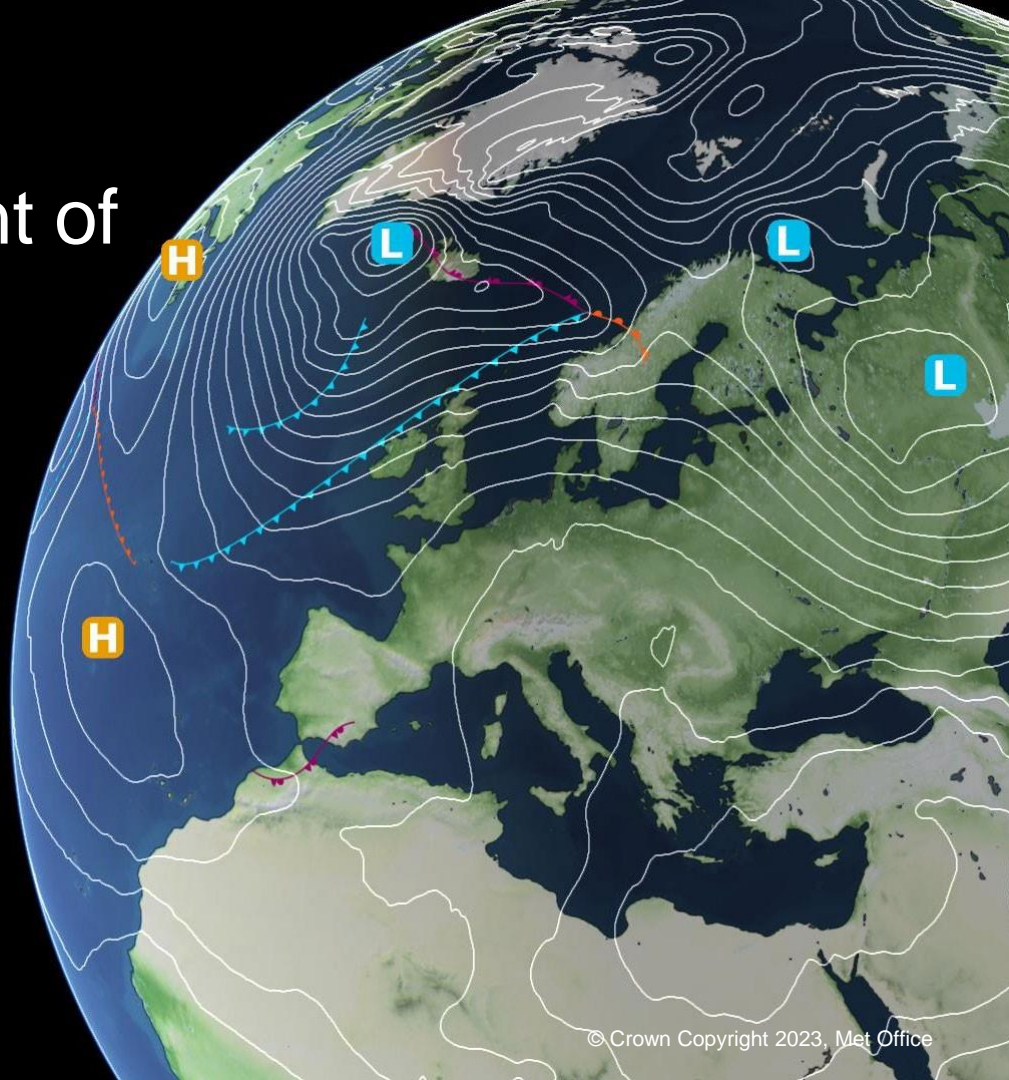# Operational Management of the Met Office Radar Network

Sandeep Sanghera

Fourth Calibration and Monitoring Workshop
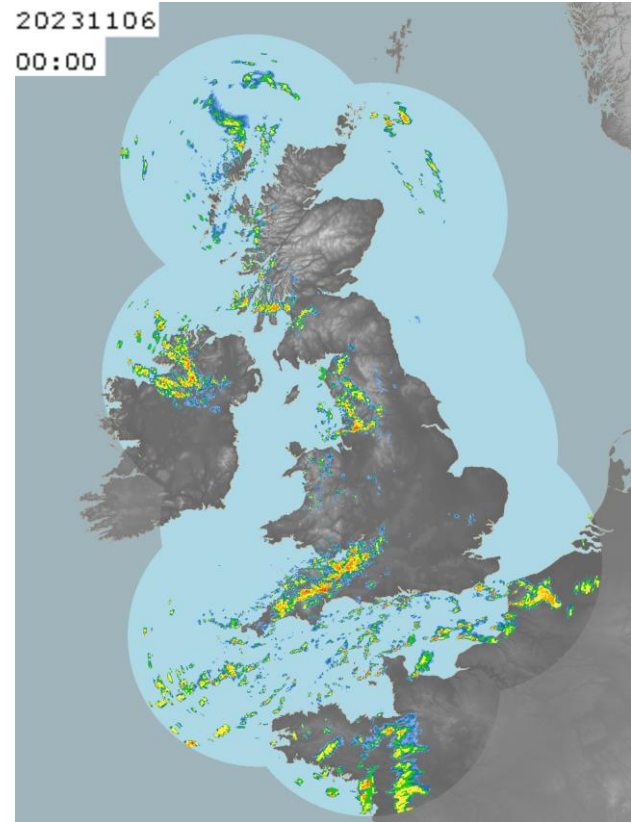
Exeter

8th November 2023

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- Network overview

- Reporting faults and implementing changes

- Radar network coverage requirements

- How the Radar teams work together

- Process of resolving faults

- Radar Hardware management

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20231106
00:00

Network overview

- 15 sites - composite ingests from a further 3 non-MO sites (plus Wardon Hill and Exeter development site)

- All Dual Pol / Doppler capable

- Radar R&D:
    - Software – Cyclops (in house design)
    - Data processing – Radarnet (in house design)

- Hardware - in house design, construction and maintenance.

- Field Service Engineers (FSE) are located across the UK and complete 6 monthly maintenance.

- Comms/Tx Room - Air Conditioned

- Radome – not temperature controlled

- Radome Maintenance - 3 yearly (completed by an external company)
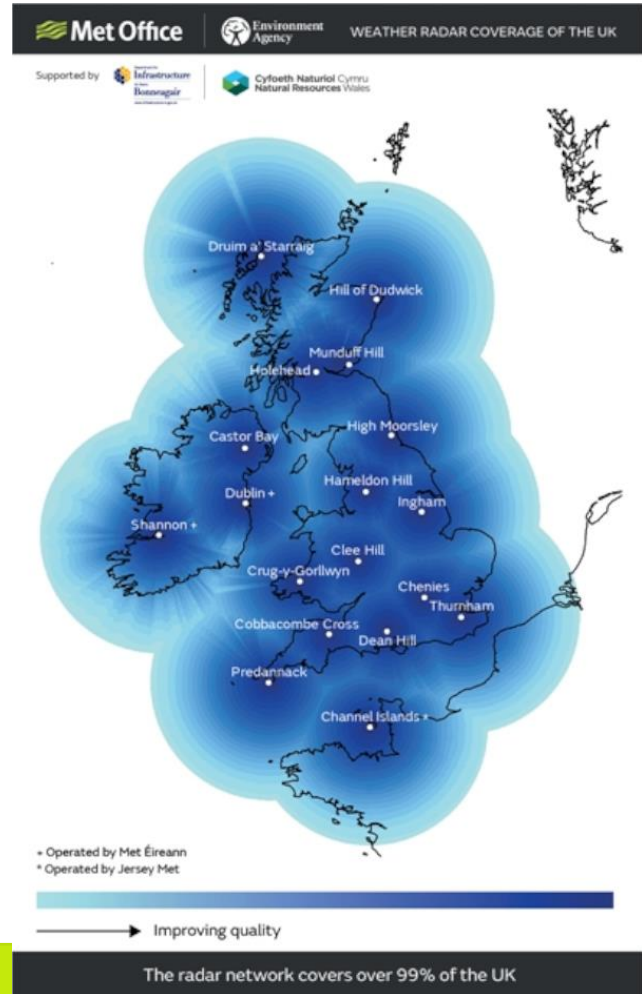
Met Office

Reporting faults and implementing changes

- Service Now: Third party IT service and operations management platform, licences have been purchased and used by many teams across the Met Office.

  Types of tickets (visible to all Service Now users):
  - Incidents
  - Problem
  - Changes
- Jira (used for software development and tracking changes)
  - Tickets for Cyclops (Radar software) requests
- Concept reach
 - Site infrastructure related issues

Incident Priority

Priority	Example	On call hours*
Low	Non outage fault such as the backup 4G link being offline	Monday - Friday
Medium	Single Radar site out of service during <u>non-critical</u> weather conditions	Monday – Friday
High	Loss of all Radars during <u>non-critical</u> weather conditions Single Radar out of Service and a valid weather warning is in force or due to come into force. Single Radar out of Service and an adjacent radar is also off.	Monday – Sunday (normal working hours)
Critical	Loss of all Radars during <u>critical</u> weather conditions	24/7

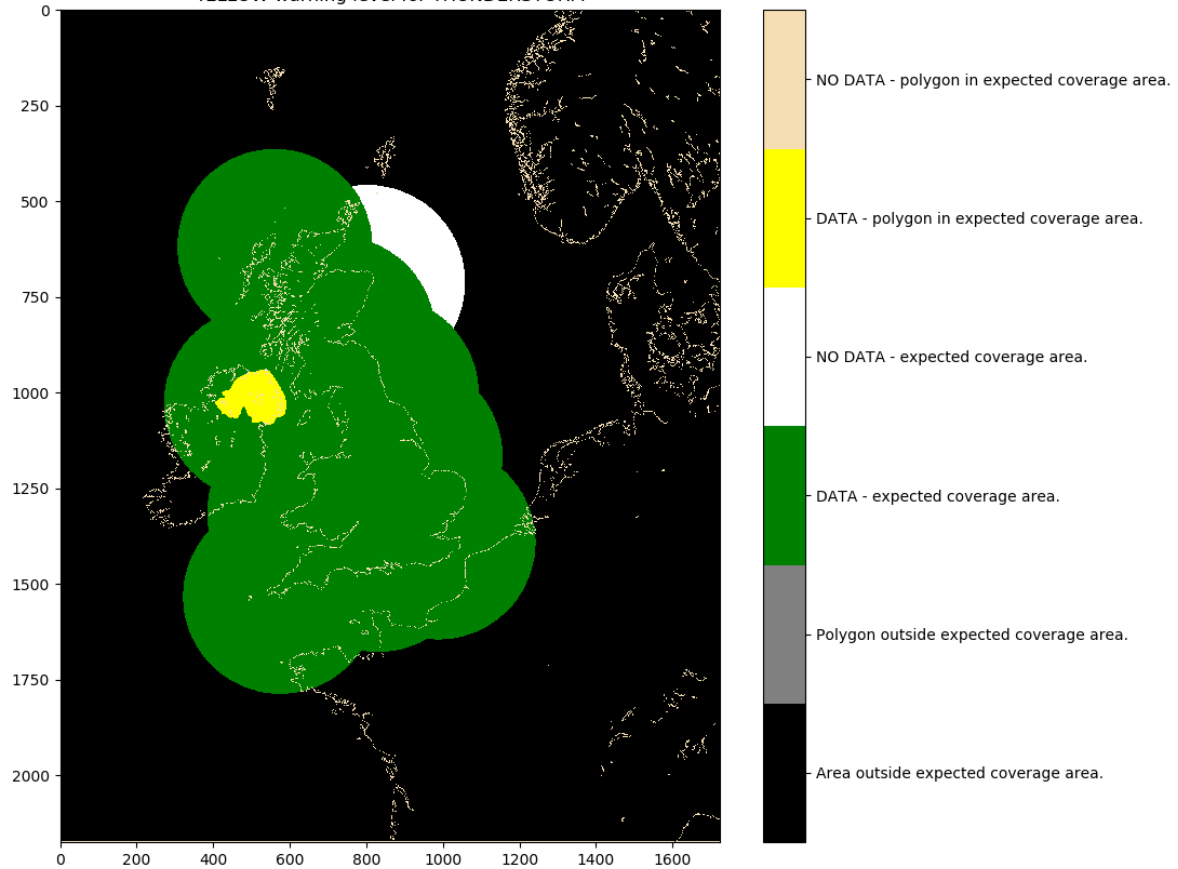*On call hours are dependent on the weather and what is happening in other observing networks

Radar network coverage requirements

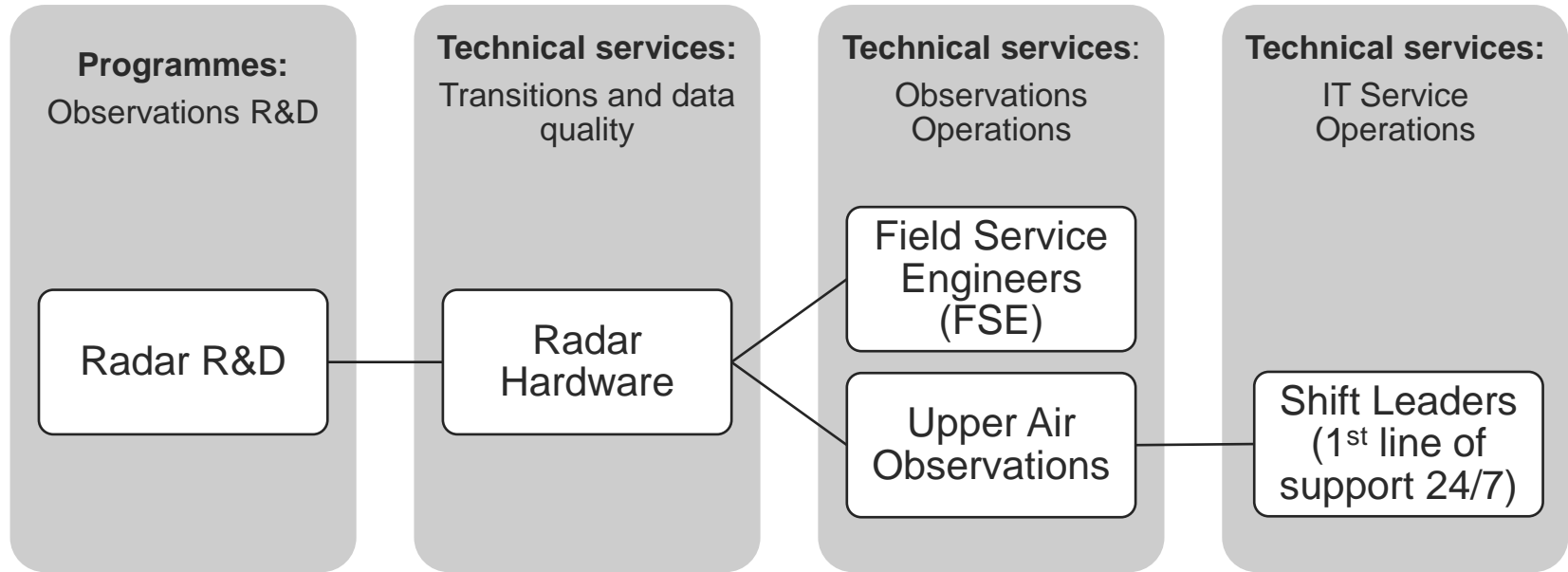| Weather Situation	Network coverage target
Red rain, snow or thunderstorm warning	99%
Amber rain, snow or thunderstorm warning	98%
Yellow rain, snow or thunderstorm warning	95%
No weather warning	80%

Yellow warning
Thunderstorm
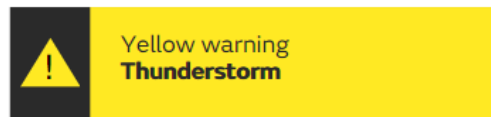
Between
13:00 Mon 19 Jun 2023 and
20:00 Mon 19 Jun 2023

Comparison of Radar Coverage to
Expected Availability at 2023-06-19 18:05:00+00:00
YELLOW warning level for THUNDERSTORM

- NO DATA - polygon in expected coverage area.
- DATA - polygon in expected coverage area.
- NO DATA - expected coverage area.
- DATA - expected coverage area.
- Polygon outside expected coverage area.
- Area outside expected coverage area.

How the Radar teams work together

Programmes:
Observations R&D

Technical services:
Transitions and data quality

Technical services:
Observations Operations

Technical services:
IT Service Operations

Radar R&D

Radar Hardware

Field Service Engineers (FSE)

Upper Air Observations

Shift Leaders (1st line of support 24/7)

Met Office

Process of resolving faults

1st line of support 24/7:
Shift Leaders

Issue: Lack of data alert from Thurnham data seen. Incident ticket created with Medium priority; customers are then informed.

Possible cause: Pentek failure error was seen.

Workaround: Restart Cyclops software. Incident resolved.
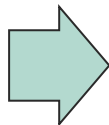
2nd line of support: Upper Air Observations

Issue became frequent – Problem ticket raised and assigned to the Upper Air team. FSE are informed of the issue.

Gathered information for the R&D and Radar Hardware team. Checked monitoring pages no issue found apart from Pentek error in the cyclops logs.

3rd line of support: Radar R&D

Radar R&D reviewed the cyclops logs and didn't think the issue lied in the PC or software. Likely to be a Radar hardware fault.
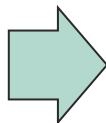
Hardware team
Consulted and created instructions for FSE

Process of resolving faults
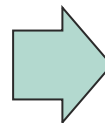
Site visit arranged for FSE

Service Now Change ticket raised for the planned outage. Shift leaders notify customers of the site outage.

No issue found with the slipring and no loose connections found.

3rd line of support: Radar R&D and Hardware team

Site visit results discussed; it was decided the receiver needs to be swapped.

Site visit arranged for FSE

Receiver swapped, resulting in resolving the ongoing issue.

R&D confirmed if the calibration figures are appropriate, then applied to site by Upper Air. Problem ticket closed.

Radar Hardware management

Hardware spares:

- Stores team – manage the Radar spares and repairs, they engage with the suppliers to manage obsolescence and stock levels.

Radar Hardware Assets are tagged if:

- They hold value
- We need to track their history/repair history
- We need to know the type of part and where it is
- We need to know how long a part has been installed.

The above information is held in Service Now.

Radar Hardware management

Life cycle management

- Monthly Radar management group meeting
  - All supporting team managers attend to discuss resource, issue over the last month and upcoming work.

- Life cycle management meeting
  - 3 monthly meeting with the Radar team managers and product owner to discuss the future of the network, this ensures everyone is keeping on track and understands the upcoming network requirements.

Questions & Answers