

Can Wind Power and Radio co-exist?

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Can Wind Power and Radio co-exist?

- Introduction
- What is Scanning Telemetry?
- Why wind farms & radio don't mix
- How to predict the effect of wind farms on radio links
- What the effects look like
- 12 ways to help wind farms and radio links co-exist
- What happens if you get it wrong?

Joint Radio Company Ltd

- Joint venture between UK Gas & Electricity industries
- Owned by Energy Networks Association & National Grid
- Financed and supported by the industries
- Manages spectrum and services for UK Fuel and Power industries
- Communications for core business activities only
- Represents members interests to Government
- Advises member companies on radio issues
- Close contact with UK water industry
- Founding Member of European Utilities Telecom Council (EUTC)



Private Mobile Radio & Microwave



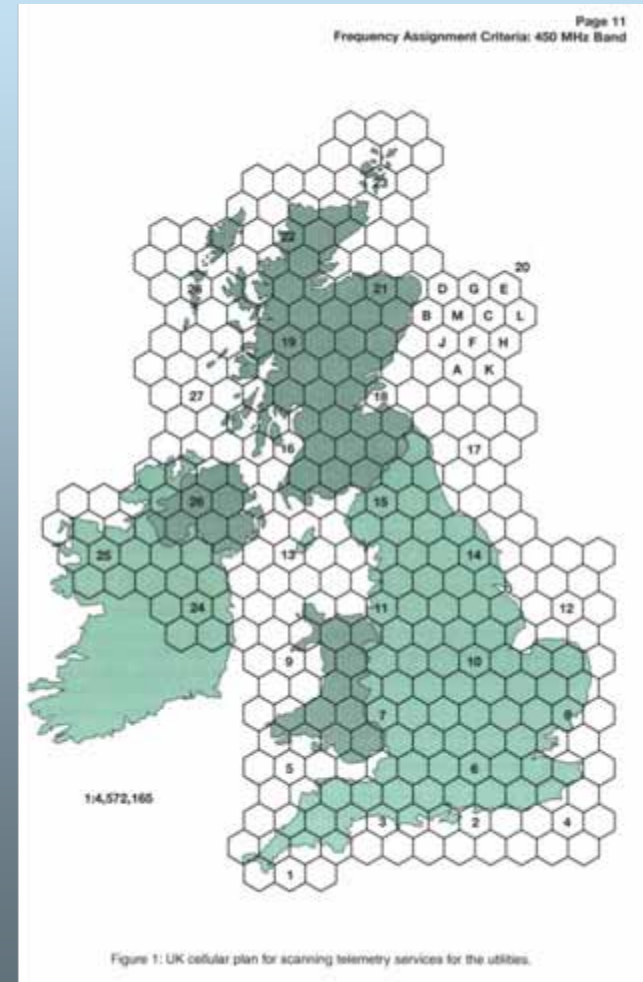
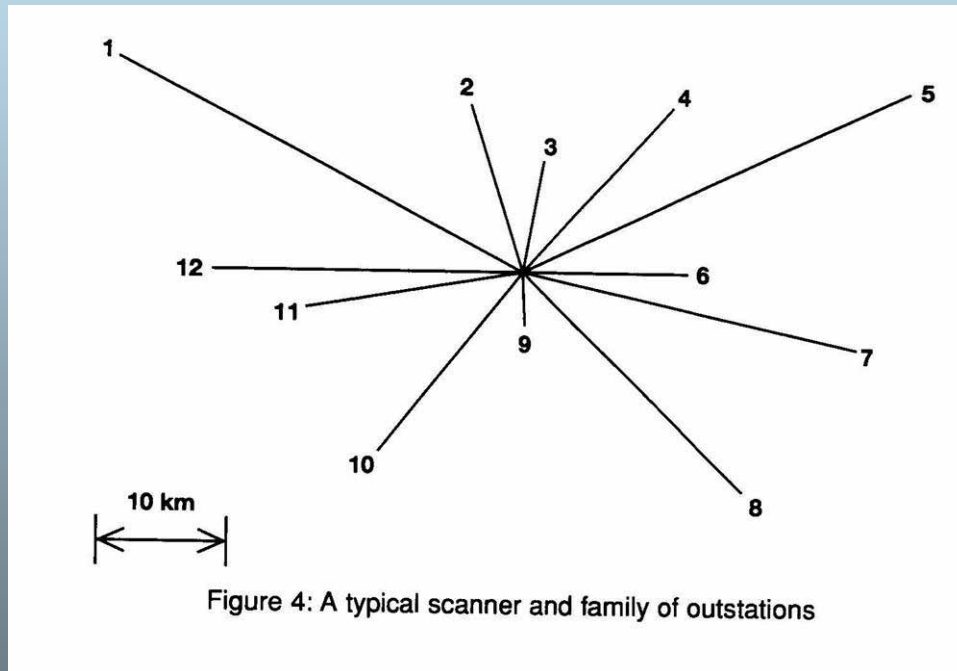
Scanning Telemetry (SCADA)

Supervisory Control And Data Acquisition

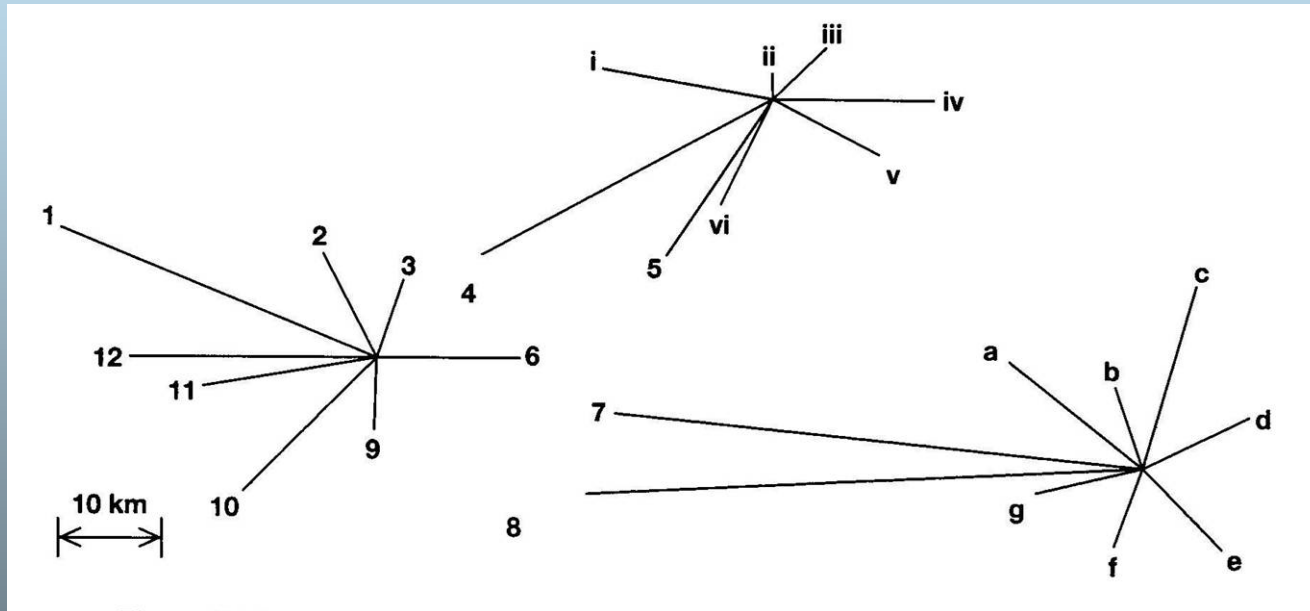


Switch 237542: What's your voltage?
Switch 237542: What's your current?
Switch 237542: **OPEN**

Scanning Telemetry (SCADA)



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Scanning Telemetry (SCADA)



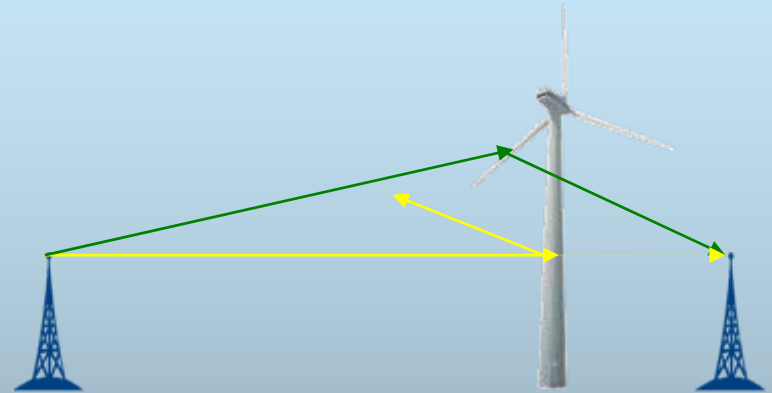
Why don't wind farms and radio mix?

- **Near field effects**

An aerial has a near-field zone where local inductive fields are significant.

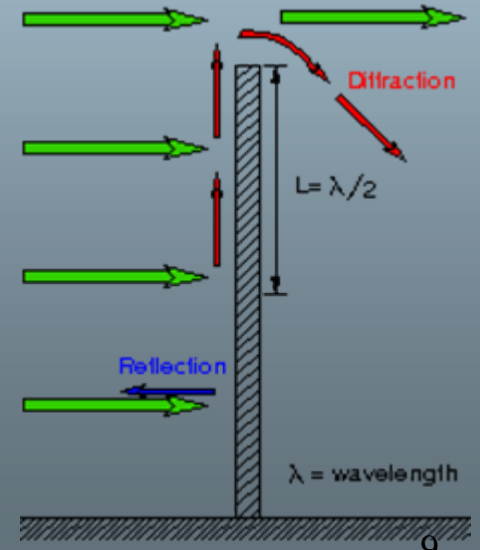
- **Obstruction**

Physical obstruction to the radio path by a turbine structure.



- **Diffraction**

Although not directly obstructing the radio signal, because of the wave-like nature of a radio signal, large structures close to the radio path can cause interference patterns to be generated.



- **Reflection/Scattering**

Radio waves are reflected or scattered off a large structure and interfere with the wanted signal.

How to predict the effects of wind farms on radio links



Exclusion zone based on Ofcom guidelines which triggers an objection for a scanning telemetry link

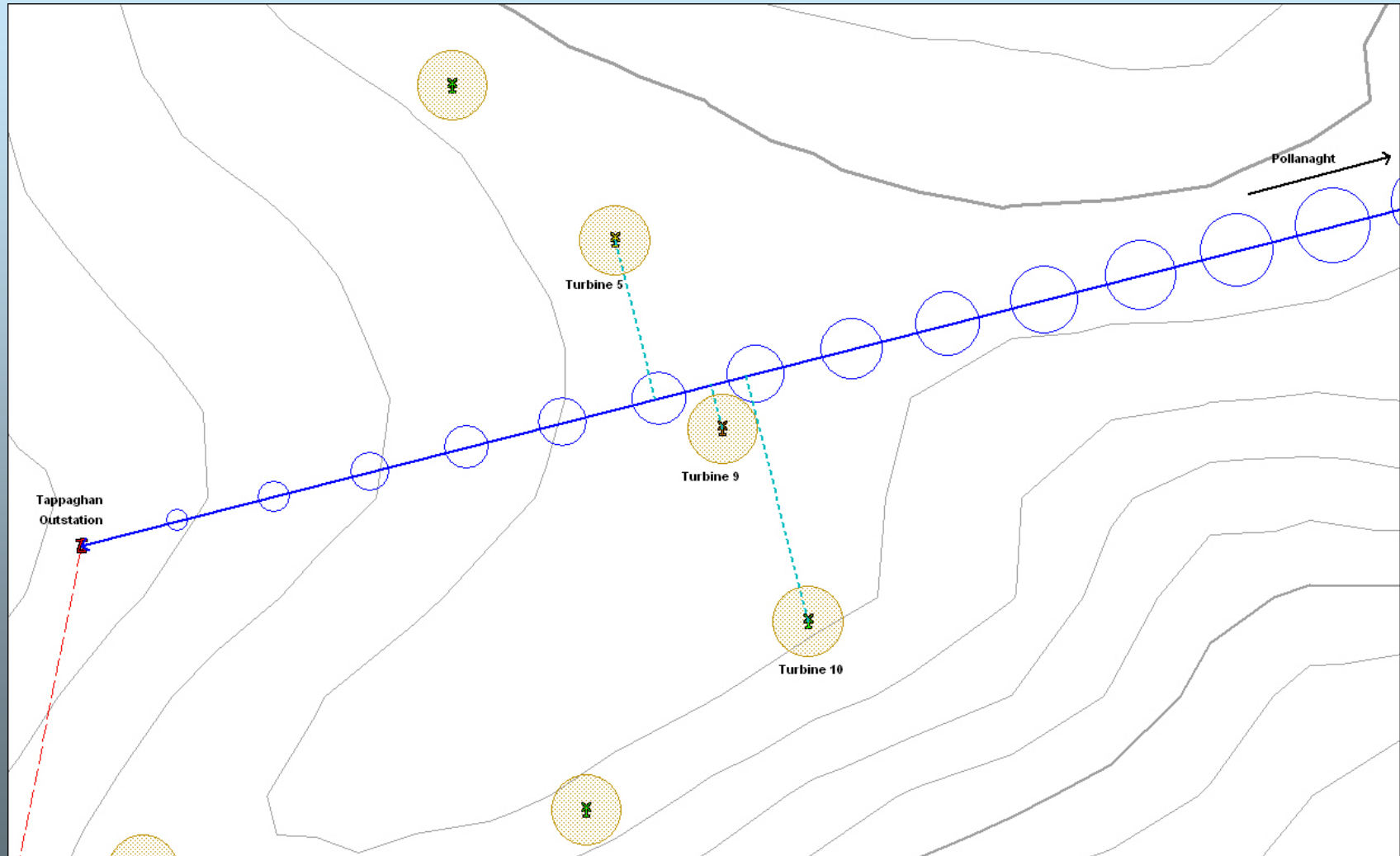
How to predict the effects of wind farms on radio links



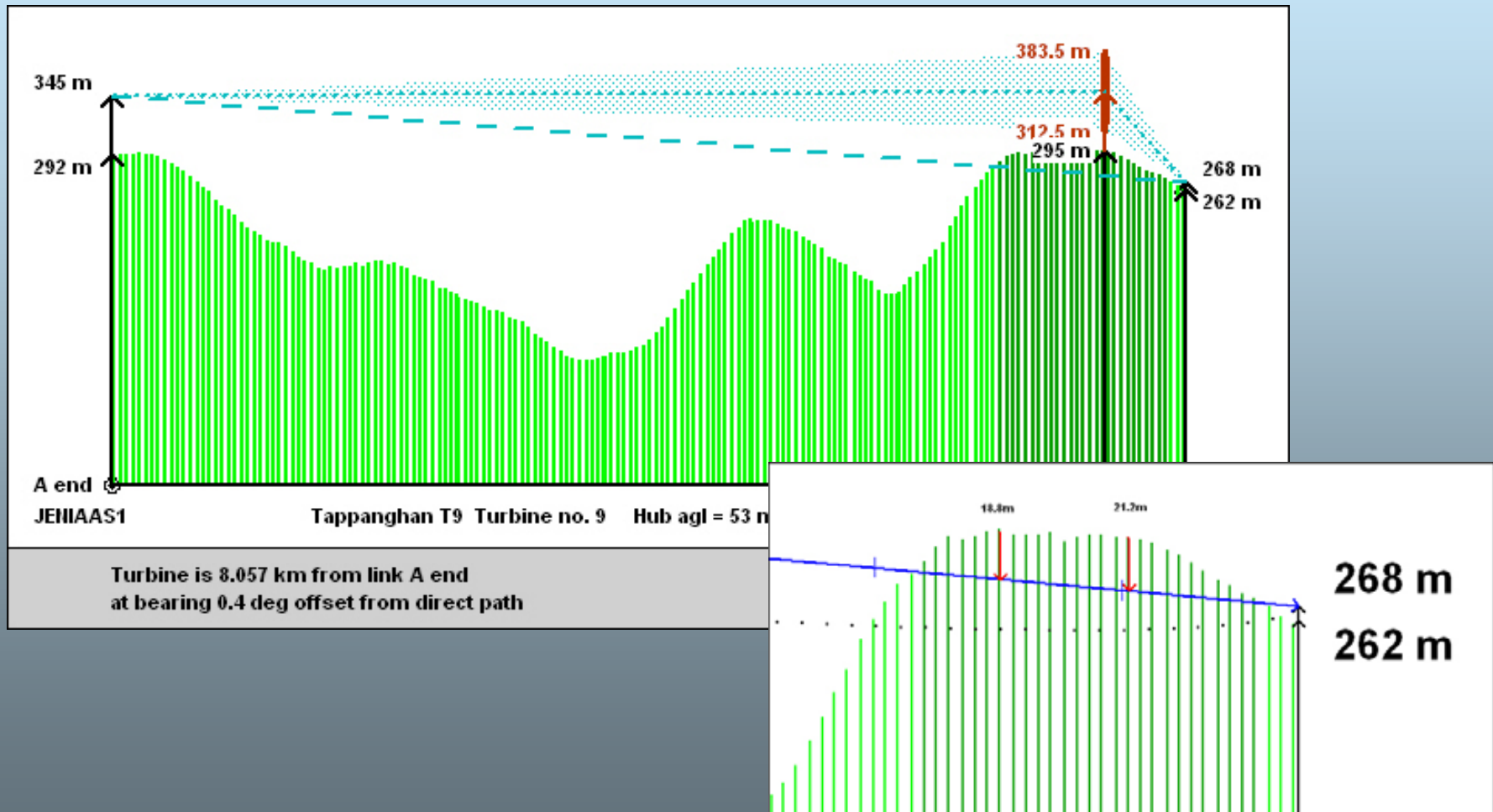
How to predict the effects of wind farms on radio link



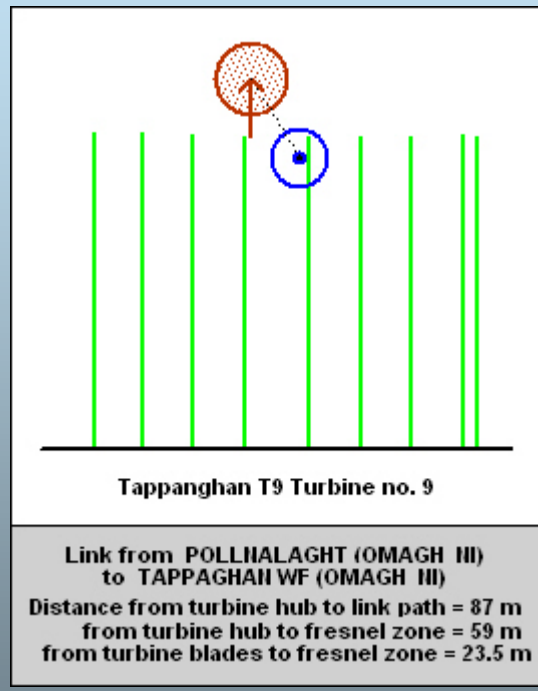
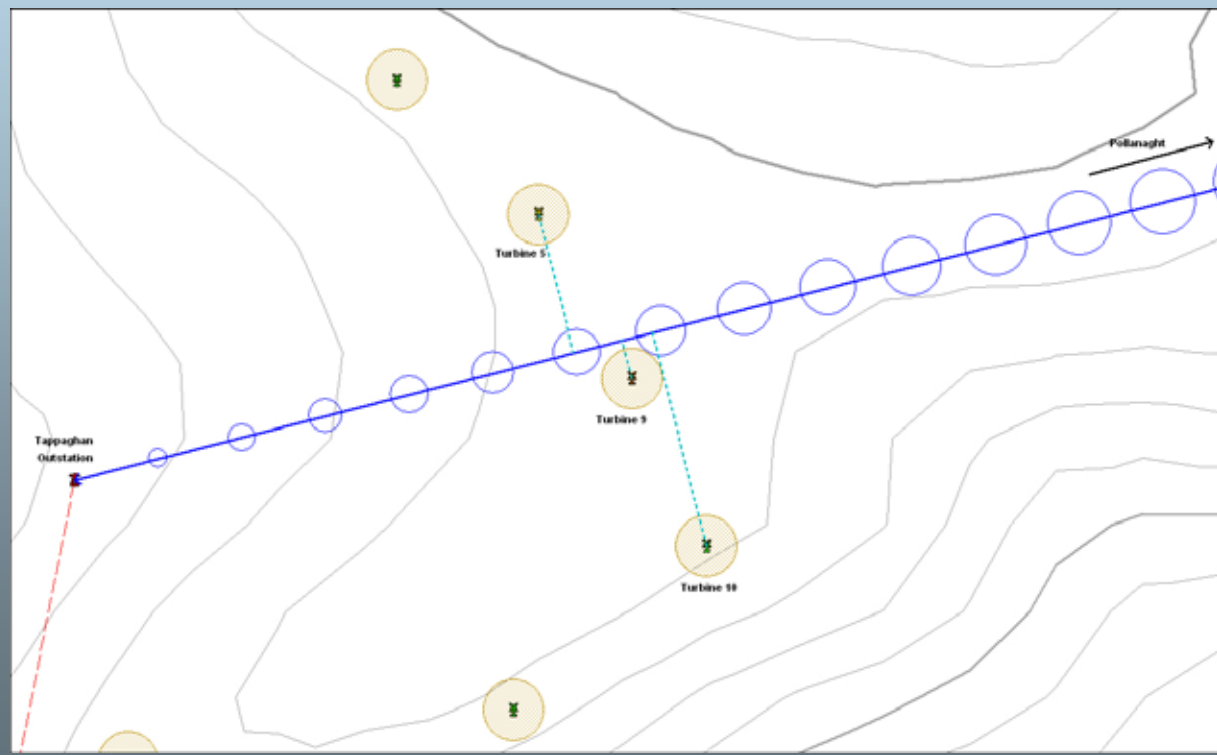
How to predict the effects of wind farms on radio link



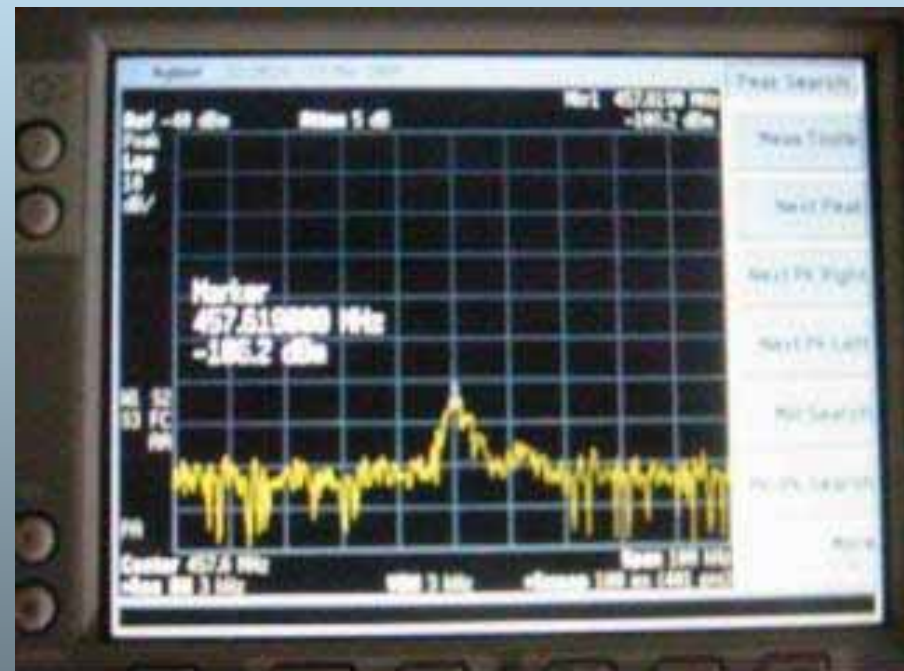
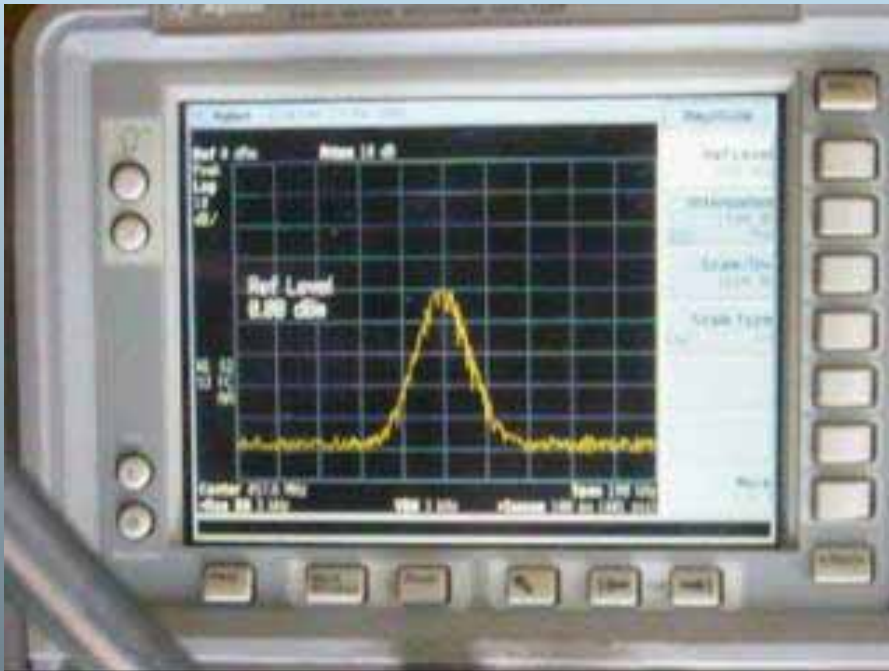
How to predict the effects of wind farms on radio link



How to predict the effects of wind farms on radio link



What the effects look like



12 ways to help wind farms and radio links co-exist



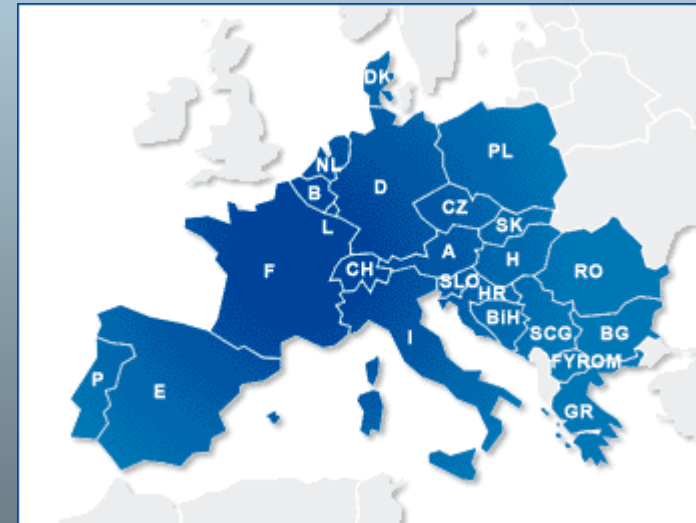
1. Good theoretical models
2. Practical research to validate models
3. Accurate location of radio sites
4. Identify corridors for radio links to pass through wind farm
5. Address telemetry outstations from an alternative scanner
6. Improve aerial discrimination
7. Find an alternative mast, eg the met mast or turbine pylon
8. Use a repeater site to by-pass the wind farm
9. Use a satellite link
10. Use a physical connection: fibre, copper, pilot cable, PSTN
11. Construct a new radio mast at an alternative location
12. Make sure your network connection is not interfered with

And if you get it wrong

Sunday 28 September 2003

A night to remember ..

[or why energy utilities are paranoid about their telemetry & telecontrol]



Account from Investigation by UCTE
(Union for the Co-ordination of Electricity Transmission)

TSOs responsible for synchronous frequency interconnection in 23 European Countries



Can Wind Power and Radio co-exist?

- Yes, if you're careful



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