Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title: **Low power licence-exemption limits above 10GHz**

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Name : **Keith Groves** Signed (if hard copy)

MET OFFICE RESPONSE TO THE OFCOM CONSULTATION ON LOW POWER LICENCE-EXEMPTION LIMITS ABOVE 10GHz

1. The Met Office welcomes the opportunity to comment on Ofcom's consultation on "Low-Power licence exemption limits above 10 GHz", published on 8 August 2008.

2. The Met Office has already contributed to the development of, and fully endorses, the joint response to this consultation from WMO, GEO and EUMETNET. We also fully support the response from ESA. There is therefore no need to repeat the technical and other points made in those responses, and this document will focus on the potentially very serious consequences of failing to protect the key radio frequency bands used in earth observation.

3. In July 2006 the Met Office produced the attached document entitled 'Impact on UK from pollution of spectral wavebands used for meteorological observing' which forms the main part of the Met Office's response to the consultation. In particular, we draw attention to the following sections contained in the document:

i). "Observing the state of the atmosphere is fundamental to the process of producing weather forecasts or climate predictions and the majority of improvements in forecasting accuracy over the last 15 years have come from using data obtained by satellites. Half of these gains can be attributed to use of instruments operating in the microwave (1-200GHz) frequency bands due to their unique ability to provide information in and below clouds, which is impossible in any other frequency band.

So far these bands have been absolutely protected from both intentional and unintentional active emissions under international Radio Regulation 5.340 which prohibits all emissions in these specified bands. Despite this, some commercial users have been pressing for this regulation to be relaxed, or even dropped, allowing active emissions in these bands and the setting of higher out-of-band interference limits.

Interference corrupts the observed data which can render it useless. The effects of this would be two-fold:

- *Setting back current capability up to 10 years through loss of vital data, wiping out recent gains*
- *Slowing the rate of future improvements that would have been expected through further exploitation of the data. New technology and observing techniques may eventually overcome the impact of the lost data, but this is by no means certain, and may be at considerable cost.*

Any relaxation of the current regulations must be resisted as the effects on the UK's current and future operations would significantly reduce:

- *capability to support and advise UK Government policy on Climate Change, International Development issues and the Environment,*
- *the accuracy of services provided in support of national security and consequent implications for the UK public and infrastructure."*

ii) "The UK investment in environmental observations in the 1-200GHz frequency range is of the order £136million, with commitment of at least £63million over the next 15 years. Much of this could be at risk if interference were permitted that corrupts data."

iii). *"These investments in environmental observations have been made by the UK government with the expectation of benefits to society to come through improved weather/environmental services. An external assessment of benefits to the UK from the services operated through / provided by, the Met Office was put at £1.5billion per annum."*

4. The Met Office is very concerned about the proposals set out in the consultation document. It concentrates on the potential benefits of '*increased competition in the provision of new and innovative radio communication goods and services*' without properly considering the very significant impacts, particularly financial, that could arise from the loss or corruption of data through interference. Statements such as '*…there is some risk that earth observation may be slightly affected.*' are particularly concerning as they indicate a serious lack of awareness of the sensitivity of the operational numerical weather prediction models to corrupt data. Low

levels of interference can be more damaging than higher levels, as plausible but incorrect observations are generated which subsequently cannot be removed by quality control routines. Obviously corrupt data, that is a consequence of higher levels of interference, can be rejected but this results in loss of data and consequential degradation of the forecast accuracy.

5. It is important that careful studies are carried out into the relative benefits of the competing uses of this spectrum. The severe flooding events of June and July 2007 that affected England and Wales are a good example of the importance of maintaining and improving the quantity and quality of the observations that are made using the passive bands. The Pitt review into the flooding, which can be found at http://www.cabinetoffice.gov.uk/thepittreview, contains the following statements:

a). Para ES.2: *"…..The insurance industry expects to pay out over £3 billion – other substantial costs will be met by central government, local public bodies, businesses and private individuals…."*.

b). Para 4.10: *"…..Evidence suggests that increased lead times for predicting events are directly related to reductions in the damage caused to properties and infrastructure. Improving the science within the models and increasing the quantity and quality of observations used in the models will both help to achieve this…."*

This indicates that mitigating action taken following accurate warnings can result in the prevention of very substantial losses. In events such as those that occurred in June and July 2007 this could amount to many £millions.

The Pitt Review also contains the following recommendation:

Para 4.17: *"RECOMMENDATION 3: The Met Office should continue to improve its forecasting and predicting methods to a level which meets the needs of emergency responders."*.

It is essential that the Met Office has continued reliable access to the observations provided through use of the passive bands if it is to achieve this.

6. There is no indication of what could be done to recover the situation if these devices were deployed and unacceptable levels of interference occurred. The devices would be licence-exempt and great difficulty would be experienced in eliminating them. We would also anticipate that it will be difficult, very time-consuming and therefore expensive to prove that particular devices were actually the source of observed interference. This situation has already occurred at 10.6GHz. The Met Office already has experience of what can happen if licence-exempt devices are permitted in bands that are essential to its operations. There have already been a number of instances of interference to C-band meteorological radars from RLANs, despite earlier reassurances from the industry that they could share with the radars through the use of DFS. The situation is likely to get worse as more RLAN devices are deployed.

7. The Met Office is also very concerned that active use of bands protected under RR 5.340 would set a dangerous precedent. Whilst Ofcom may believe that the proposed devices can be deployed in the UK in a manner that would not cause unacceptable interference to users of the passive bands, this cannot be said of the administrations in many other countries. The Met Office, to support agreed UK Government national and international commitments, needs observations from all over the globe.

8. It is also not clear whether interference into the passive bands from other current and future sources has been taken into account.

Consultation question responses

Q1: Do you agree with this assessment of the services that do not need further analysis?

The Met Office does not agree with this. Considerably more work needs to carried out on the impact of the proposals on the passive services. This must include assessments of the impact on future developments in remote sensing. The Met Office agrees with the response given by WMO, GEO and EUMETNET

Q2: Is this analysis of the risk of interference to broadcasting satellite correct?

Not applicable

Q3: Is this analysis of the risk of interference to radionavigation and location correct?

Not applicable

Q4: Is this approach to meteorological aids appropriate?

The Met Office agrees with the response given by WMO, GEO and EUMETNET

Q5: Do you agree with the proposed licence-exemption limits set out above?

The Met Office agrees with the response given by WMO, GEO and EUMETNET