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# **Comments on RA Consultation Document on the 450-470 MHz band re-alignment project**

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## **Speedwing Mobile Communications comments on the proposed 450-470 MHz band alignment**

Speedwing Mobile Communications wish to make a number of observations on the proposed 450-470 MHz band alignment. In our marketplace, there are a number of issues that concern us regarding the feasibility and practicality of the programme.

For on-site networks at relatively small geographic sites such as airports, there is a vast array of RF emitting infrastructure ranging from aeronautical VHF AM to radar, wireless Lan, cellular and PAMR, bringing opportunities for interference products when any changes are made. To minimise the impact, a specialist team of radio engineers is required to arbitrate and solve the inevitable interference problems. The RA have historically provided such support which they have funded from the license revenue stream, but it is not clear that OFCOM will enjoy the same benefit and so the continuity of such a team must be in doubt.

There is also concern about the costs of such an exercise. In the past new incumbents have always paid for any rectification work. What are the rules in this case? Will there be a dispute over the responsibility and will this delay the implementation date? There needs to be much clarification in this area.

We do not agree that the benefits claimed in the consultancy document justify the related risks and costs. Airport systems are 'on-site' by definition and we have engineered out most of the effects of continental interference. There are also concerns that the issue may exist on a wider basis and all that will happen is a shift to the West? We have concerns that there maybe future programmes planned, e.g. for Ireland.

The consultancy document lays claim that 2-3MHz of spectrum will be made available by re-packing of channel assignments from the better utilisation of spectrum. In fact there is a release of some 6MHz, which will happen anyway. Whilst there is some doubt in the claim to the 2-3 MHz, there are easier ways of solving these issues today. We have provided a common platform at nine UK airports, which allows whole communities of users to be housed on a set of trunked frequencies. As well as making that spectrum which would have been used by private systems available, we can shield the users from any future disruption.

Perhaps the most serious issue is the potential disruption to operations at airports during the changeover. It may be feasible to conceive a one hit transition for on-site systems but we would need a working parallel infrastructure and find a timeslot for transition where least disruption would occur. Both of these aspects carry potentially significant cost and operational implications. Heathrow Airport is an excellent example where such an issue will undoubtedly arise.

Speedwing believe that these issues require significant further investigation in order to decide whether the costs, potential disruption to a significant sector of the transport industry and net benefit to the radio industry are substantial.

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## **Speedwing Mobile Communications perspective on the spectrum allocation**

Speedwing is a large user at airports providing a common trunk radio platform to mission critical on-site users whereby these companies' activities have ramifications on the efficiency, safety and security of airport operations.

We understand the Agency's desire to increase the efficiency of spectrum use and we positively contribute to this aim by providing common platforms at UK airports. Thus our mission is to persuade a substantial number of the estimated 35,000 airport users to use the Speedwing trunk radio airport network. To date we have 4,000 live users at 9 airports and new systems are planned in 2003/2004 at a further 8 UK airports making a total of 17 UK airports.

## **Comments from the technical viewpoint**

Of Speedwing's 17 current and planned airport trunked radio systems, 14 are licensed in the UHF1 band and 3 in the UHF2 band. For Ground Movement Control, many airports run repeaters in the UHF2 band.

Our technical evaluation of changes required on those systems directly affected in the UHF2 band is as follows:

- Base stations, mobiles and portables will have to be reprogrammed
- Base station circulators will need retuning or replacement
- Base station duplexers will need retuning
- Some spot frequency antennas will need to be replaced
- Hybrid antenna combining systems will need retuning of receive splitters, TX circulators and TX antenna filters
- Block channelised cell enhancers will need retuning and programming of modules
- Any installed filtering of broadband cell enhancers will need realignment to block the new allocation of the unwanted frequency.

At Stansted Airport, the current allocated frequencies it is suggested that a number of changes would be made at different steps of the changeover process. It is very likely that having transposed RX frequencies too close to un-changed TX frequencies for any period of time may cause interference.

In an airport environment, we clearly cannot plan for such a long changeover. A simple remedy for this could be to allocate new frequencies to be changed together within the early part of the process.

At Bristol Airport, the frequencies will have to be changed. Since this network is not yet on-line it would be more effective to have frequencies allocated in a different band to avoid any disruption to the service. A better solution would be to have realigned frequencies used from the start.

At Jersey Airport, the equipment will need to be replaced so that it can be retuned to the new band.

Speedwing also provide PMR radio for use on VHF Ground Movement Control frequencies. These radios are installed in vehicles, which typically travel about the airport ramp and cross runways. For safety, many airports provide VHF GMC communications through an UHF uplink, and it is this that will be affected. It is critical to be able to be able to retune or replace such equipment at one time to avoid disruption to the airports. Whilst Speedwing can control this for its own customers, the number of changes to a large airport such as LHR will be excessive and is likely to cause severe disruption.

As experienced recently, the recent changes for CTCSS to be introduced on the airports UHF link to the ATC Ground movement control (GMC) VHF AM channel at London Heathrow have taken many months to complete with disruptions to the operational activities of the airport. The whole programme was delayed for 6 months as some of the user groups failed to meet the imposed timescales and there were 3 deferments in the programme to allow them to “catch-up”. This was a relatively minor exercise in comparison to what is being proposed should re-alignment go ahead, but still resulted in a prolonged and untidy process before being fully implemented

### **Comments from the economic viewpoint**

To a certain extent Speedwing has sheltered its own customers from any changes of equipment as all the current handportable and mobile equipment are capable of being retuned to the new frequencies. There will be many costs associated with infrastructure – base stations, antenna combiners and filters and cell enhancers that sit in the UHF2 band. The other significant cost is in man power where changes must be carried between operating hours to maintain the concurrency of the airport users community.

The very nature of airport operations means that communication concerning a single dispatch of an airline is spread over a number of companies. Added complexity here arises through larger subscriber volumes, less 'quiet' periods across a 24/7 operation, the need for continuity of integrated (inter-company) comms as well as internal operations and service penalties for radio system downtime outside agreed SLA's. So this is not just a question of efficient operations; it permeates the business economics and brings in each companies' duty of care for safety and security. Speedwing itself must adhere to Service Level Agreements that demand a high Grade of Service and continuous operation.

It may be feasible to conceive a one hit transition for on-site systems but in this case we would anticipate that it would require us to establish a working parallel infrastructure in order to minimise downtime. We would also need to carry out any transition at times where least disruption would occur. Both of these aspects carry potentially significant cost implications in their own right and could escalate quite readily beyond that, depending on the number of stages involved in re-farming and interference issues that needed to be subsequently resolved.

The suggestion that sufficient equipment, channels, functionality, coverage or network integrity would be available through short term hire is unlikely, particularly where there are cell enhancers and leaky feeders being employed. Thus a one hit transition is unlikely to be achieved.

### **Comments on the approach**

The multi staged approach is sensible considering the complexity of the changes, but the nature of some of Speedwing's systems mean that frequencies are planned for changes at different stages. This is difficult to plan and may mean additional equipment costs. Airports are small geographic sites and the implementation of such a change programme will inevitably lead to interference issues. The practical issues faced in re-alignment are more complex in so far as the users do not typically come from only one organisation but from a range of commercial operators at the airport all with distinct requirements but related through the airline operations that they support. Whether this impacts on user operations will depend on the ability of the designated RF engineers to resolve amicably. There remains a question of who will manage and police this process, and also who will bear the cost of any resultant rectification from interference.

Heathrow airport represents a good example of the complexity involved on such a site. Speedwing's on-site trunk network at Heathrow operates in UHF1 supporting around 2,500 users. We share that relatively small geographic site with around 4,000 other PMR subscribers, mostly on UHF2 which will all need to move. Add to the mix a vast array of other RF emitting infrastructure ranging from aeronautical VHF AM to radar, wireless Lan, cellular and PAMR, the opportunities for

some interesting interference products when you change the mix are clear. In addition, outside of the managed networks, the logistics of co-ordinating changes across such a large number of licence holders on site is significant.

## **Comments on the timescale**

The timescale is very long and whilst it gives users time to plan, it does mean a great deal of uncertainty in the industry as some of these stages are dependant on external events completing (e.g. the Public Safety Network). This uncertainty may sway some users to move to other technologies, which will depress the whole industry. It may also mean that users migrate to digital technology before that equipment is mature, giving rise to additional costs and a below par service.

Much of the planning relies on OFCOM having available the skilled radio engineering team from the RA. Should this not be in place there will be additional costs of contracting this service which will be substantial. The risk of not having such a core team is that the actual process becomes defective with additional disruption to the users.

## **Conclusions**

Speedwing understand the issues that have brought about this proposed programme of change, but we do not believe that the benefits claimed in the consultancy document justify the related risks and costs. Airport systems are 'on-site' by definition and have engineered out most of the effects of continental interference. If such a problem exists more generally in the SE of England, wouldn't it be the case that we are simply shifting it to the West? Does the Irish government plan to carry out a similar exercise?

The consultancy document lays claim to the better utilisation of spectrum. There is some doubt in this claim, particularly as there are demonstrable ways of solving these issues today, some of which Speedwing have been employing ourselves. Providing a common platform at airports allows whole communities of users to be housed on a set of trunked frequencies. Any changes to technology and spectrum can be wide ranging and will shield the users from disruption. The result is an optimal sharing of spectrum, which benefits all users.

The proposed programme will also inevitably bring major disruption to the UK Air Travel Industry. Speedwing operate systems at the 17 largest and/or busiest of the UK's airports, and we estimate that there are some 35,000 PMR subscriber units operating mission critical services on systems that are mostly UHF, site specific and, as a result, in very close proximity to one another. We believe that this will present a number of issues and challenges (not in the least the cost) in implementing the proposed band reversal scheme.