

**Questionnaire related to the regulatory consideration of the protection of PMSE<sup>1</sup> in the UHF band in a context of WSD (White Space Device) use**

*Information to be provided in the cover of the questionnaire:*

<b>Responding company/organisation</b>	COGEU: Cognitive radio for an efficient exploitation of TV white spaces in the European context FP7 ICT project <a href="http://www.ict-cogeu.eu/">www.ict-cogeu.eu/</a>
<b>Country</b>	Portugal
<b>Address/ e-mail address</b>	<a href="mailto:pmarques@av.it.pt">pmarques@av.it.pt</a>
<b>Contact name</b>	Dr Paulo Marques, (COGEU project coordinator)

***Contact details of a company will not be published outside the WGFM.***

***Correspondence Group on Cognitive Radio Systems (CG CRS), only answers in gray boxes will be used for analysis. Contact details may be used in case of inaccuracy or in case of specific questions.***

**Respondents are kindly invited to return the completed questionnaire  
before 16 September 2011  
to the European Communications Office (ECO)**

To: Thomas Weber  
preferably by e-mail: [thomas.weber@eco.cept.org](mailto:thomas.weber@eco.cept.org)  
or  
by fax: +45 33 89 63 30

Thank you for your cooperation.

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<sup>1</sup> CEPT Report 32 describes PMSE applications  
(<http://www.erodocdb.dk/Docs/doc98/official/Word/CEPTREP032.DOC>).

## **Introduction:**

During the 71<sup>st</sup> meeting of WGFM, 31<sup>st</sup> January – 4<sup>th</sup> February 2011, it was decided to task CG CRS to work on regulatory consideration on the protection of PMSE on the basis of section D.1 of Chapter 11 of ECC Report 159.  
(<http://www.erodocdb.dk/Docs/doc98/official/Word/ECCREP159.DOCX>).

This section D.1 states:

### ***D. Regulatory consideration on the protection of PMSE***

***D.1*** *The approaches to protect PMSE services from WSD<sup>2</sup> interference need to be identified in accordance with the regulatory regimes employed by different administrations. Specifically, there is a need for further investigation related to the development of a "package solution" that covers a number of tools from which individual countries can choose, such as registration of PMSE in the database and safe-harbour solution.*

## **Questionnaire:**

It is considered necessary, as a first step, to have a broader view on the various approaches from the CEPT administrations to ensure the use of PMSE in the 470-790 MHz band. To reach this objective, administrations and Industry are invited to answer the following questions.

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<sup>2</sup> White Space Device.

**Section A for administrations:**

1. Before the TV switchover from analogue to digital in your country:

Do you, or did you, authorise the use of the 470-862 MHz band for PMSE applications?	
Under which regime? (Individual authorisation? General authorisation? License exemption?)	

2. After the TV switchover from analogue to digital in your country:

Do you, or will you, authorise the use of the 470-790 MHz band for PMSE applications?	
Under which regime? (Individual authorisation? General authorisation? License exemption?)	

3. Do you envisage the introduction of white space devices in the 470-790 MHz band?

Yes / No	
Could you explain your choice?	

4. Do you currently study, or plan to do it in a short time frame, such introduction?

Yes / No	
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5. If you answered “yes” to question 2 above, do you consider that specific mechanisms (e.g., registration in database(s); channels not used by digital TV reserved for PMSE, also called “safe harbour” in ECC Report 159; cognitive capabilities,...) have to be considered to ensure the protection of PMSE with respect to a potential introduction of WSD?

Yes / No	
If so, could you indicate which mechanisms do you foresee?	
For each of these mechanisms, could you give some details and potential advantage/drawback?	

- 5a. In case of registration of PMSE in databases: do you foresee to have sufficient information available, to register PMSE operation in a possible geolocation database?

Yes / No	
If so, which category / type of use of PMSE would be registered and how?	

- 5b. In case of safe harbour:

How many channels would you foresee?	
Would they be regional wide / nation wide?	

- 5c. Other mechanisms (e.g.: beacons, Cognitive-PMSE,...):

If so, please describe.	
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- 5d. Do you consider that any mechanism (e.g., data base, safe harbour, cognitive capabilities,...) have to be considered to ensure the protection of PMSE if no WSD are deployed in the 470-790 MHz band?

If so, please describe.	
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**Section B for Industry and Users:**

1. Do you envisage requesting your Administration or CEPT the introduction of white space devices in the 470-790 MHz band?

Yes / No	No
If so, can you provide details? - date of introduction, - type of applications, - type of technology.	

2. Do you consider that specific mechanisms (e.g., registration in database(s), safe harbour, cognitive capabilities,...) have to be considered to ensure the protection of PMSE with respect to a potential introduction of WSD?

Yes / No	Yes
If so, could you indicate which mechanisms do you foresee?	<ul style="list-style-type: none"><li>- Geo location database system</li><li>- Safe harbour based system</li><li>- Beacon / sensing</li></ul>
For each of these mechanisms, could you give some details and potential advantage/drawback?	<p>Geo location databases are available in some countries (e.g. UK) but not so in others (e.g. Germany). It may take some time to establish such a database and there are still open questions. Running the database also causes costs. On the other side if in stable operation, a database is seen as a reasonable tool to protect the predictable (see below) PMSE use. The update time is one important parameter determining the costs: longer periods, e.g. on a 24 hour basis could keep the costs within reasonable limits.</p> <p>Safe harbour concept as described below for ENG application is an easy to install method to avoid interference. This is the regulatory scenario considered by the European research project COGEU (<a href="http://www.ict-cogeu.eu/">http://www.ict-cogeu.eu/</a>). However the PMSE equipment has to be reconverted to the reserved bands or replaced. Besides, investigation are required whether the reserved channels proposes channels 21 to 40 for this) would be enough.</p> <p>Sensing would be a cost saving way to operate WSD without requiring a database. However the extremely low sensing thresholds, required to overcome hidden node problems, makes this variant improbable for the moment. Cooperative sensing could lower the requirements.</p> <p>PMSE beacons (small transmitter informing WSD on PMSE operation at a given location) could be a cheap and easy to realize way to protect PMSE. However as the beacon has to be operated on a separate frequency this requires bandwidth as well. Besides, the WSDs have to be prepared to understand the beacon signals: some standardization may be required, which may take some time. No advantage is seen for beacons.</p>

- 3a. In case of registration of PMSE in databases:

Which category / type of use of PMSE should be registered and how?	<p>PMSE use can be divided into two classes:</p> <p>a) Predictable All those events than are scheduled some time ahead of the event like sports events, music events and so on. Also PMSE use in museums, concert halls, churches... can easily be planned.</p> <p>b) Spontaneous ENG – Electronic News Gathering is something that in general can not be planned. Examples are bad accidents like air crash, oil accidents, earth quakes... Spontaneous political events like resignations may also belong to this class</p> <p>PMSE use of type a) can easily be registered in a database. The way it can be done depends on the way the database is organized (e.g. local or national). The PMSE may contact the database directly or a local institution that tells it which database to contact. Then PMSE may then ask for assignment of channel(s).</p> <p>Contact is via internet, either wired or wireless.</p>
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3b. In case of safe harbour:

How many channels would you foresee? Would they be regional wide / nation wide?	<p>Some countries (e.g. UK) decided to clear one or even more channels from broadcast use and to reserve these channels for PMSE usage. It is believed that this is a waste of spectrum especially in a time where digital dividend cut down the available spectrum for broadcast and where new applications like HDTV transmission are envisaged.</p> <p>PMSE use within the locally unused TV channels has been a proven and successful concept for almost 50 years. So it is proposed to reserve the TVWS in the lower channels (e.g. 21 to 40) for ENG exclusively (i.e. no CRD transmission within these channels). (Note: The predictable PMSE applications shall be registered in a database, which has to be queried by CRD to get assigned appropriate channels before being allowed to transmit.)</p>
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3c. Other mechanisms (e.g.: beacons, Cognitive-PMSE,...):

If so, please describe.	
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3d. Do you consider that any mechanism (e.g., data base, safe harbour, cognitive capabilities,...) have to be considered to ensure the protection of PMSE if no WSD are deployed in the 470-790 MHz band?

<p>If so, please describe.</p>	<p>In Germany the situation so far is as follows: Ch. 21-50: Reserved for public and private broadcast (SAB) and fixed SAP installations Ch. 51-60: Professional use (PMSE=SAB/SAP) fixed installations, rental services , music groups Ch. 61-69: License free use (may also be used by professional PMSE)</p> <p>After digital dividend channels above 60 have to be cleared by broadcast and as well by PMSE. It can be assumed that these PMSE applications will also have to be accommodated in the lower bands then. This means that the density of PMSE use will increase in the future.</p> <p>To guarantee non interfered operation of PMSE (among each other) provisions are required. For the case where use of PMSE can be scheduled in advance, registration in a database seems to be the best solution. For ENG applications (spontaneous use) querying the database could be the way to protect registered PMSE applications, combined with sensing abilities to protect other ENG equipment.</p>
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