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### **APWPT comments on the “RSPG Public Consultation on Licensed Shared Access”**

The APWPT is pleased to provide its comments in this PMSE consultation (“Consultation”) on Licensed Shared Access (“LSA”). APWPT is an international not-for-profit organisation, which is representing the needs of all users of the Programme Making & Special Event (“PMSE”) sector ([www.apwpt.org](http://www.apwpt.org)). The members of APWPT include PMSE organisations, users and manufacturers. The APWPT directly and indirectly represents over 25,000 members of the PMSE community in Europe and beyond.

The RSPG mentions PMSE in its Consultation document as follows:

*“In a number of bands (mainly public spectrum and broadcasting) additional (secondary) users share the spectrum with an incumbent user under certain restrictions (mainly geographical and temporary restrictions) e.g. PMSE (Programme Making and Special Events) within TV white spaces, SAB/SAP services, ENGs. Whether or not such use would be considered under the LSA approach depends on the level of protection provided with the rights of use of a shared band. When the shared rights of use are provided on non-interference, non-protection basis and no licence is granted, it would not be an example of LSA. However, when a licence is granted to the additional users it could be seen as an LSA case.<sup>1</sup>”*

The APWPT agrees with this finding and in general encourages and promotes the concept of LSA. The PMSE industry already has experience with spectrum sharing that the RSPG and the NRA could draw from: for many years PMSE - especially wireless microphone manufacturers and users - have gained valuable experience on how to share spectrum with the broadcaster in the UHF TV band. For instance, public/private spectrum sharing could potentially be enabled by a joint data base of available spectrum for public and private users in certain bands. The APWPT believes that spectrum sharing with PMSE is an LSA case and the broadcasters use the

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<sup>1</sup> See page 11 in the consultation document

UHF TV bands as licensees. Today, PMSE equipment is embedded in many sectors and its use is rapidly expanding to meet increasing demand for more sophisticated productions and advanced audio services. Instead of losing frequencies and being forced to migrate to other bands, using LSA instead could be a viable alternative for the APWPT members, provided that there are no interference issues (*see* APWPT's more detailed comments below).

Furthermore the current secondary status of SAB/SAP is a possible thread to ignore the interest of PMSE users as the secondary user uses the spectrum on a non-interference, non-protection basis. This status is not in balance with the importance that PMSE has already proven in past 65 years of its existence.

In the United States, policymakers have recognized that exclusive reallocation of government-use spectrum takes a long time, is very expensive and may not lead to the most efficient use of spectrum. Reallocation, therefore, may not be able to meet the soaring demand for new spectrum in the near term. U.S. policymakers are now looking at spectrum sharing. There are at least two types of sharing being discussed in the United States:

- **Geographic sharing:** The public entities would allow commercial providers to use the spectrum in areas where they are not (fully) using the spectrum.
- **Time-shifted sharing:** Allowing commercial providers to use spectrum during certain periods of time when the government is not using it.

Cognitive/Database Sharing is an innovative technology that could be used to scan the spectrum or provide Internet access to a database to ensure that applications designed to use the same frequencies of spectrum are not using them at the same time and interfering with each other.

In addition to two reserve TV channels per market for wireless audio production, the Federal Communications Commission (FCC) has already adopted an innovative geolocation database sharing scheme to carefully balance the interests of new spectrum users and incumbents, including wireless microphones. Support for it came from a broad cross-section of users, including the National Association of Broadcasters ("NAB"), Comcast Corporation and NBCUniversal Media, LLC ("Comcast/NBCUniversal"), the National Football League ("NFL"), The Walt Disney Companies (including ESPN, ABC Network and Walt Disney World), The Broadway League, The Recording Academy, the Grand Ole Opry, the Metropolitan Opera, Cirque du Soleil, the Screen Actors Guild-American Federation of Television and Radio Artists and AFL-CIO, The Performing Arts Wireless Microphones Working Group, various churches, the National Systems Contractors Association, Northwestern and Drexel Universities, and over 100 of the nation's top audio service providers. These parties and their counterparts in the EU would probably endorse a similar database sharing system in the EU Member States.

In addition, the 3.5 GHz band is currently the subject of a separate FCC rulemaking set to examine a new "small cell" sharing scheme between commercial users and a significant number of existing federal users, which does not contemplate the use of this spectrum by wireless microphones (*see* Amendment of the FCC's Rules with Regard to Commercial

Operations in the 3550-3650 MHz Band, Notice of Proposed Rulemaking and Order, GN Docket No. 12-354, FCC 12-148 (rel. Dec. 12, 2012).

However, as positive as LSA is in general for PMSE, it needs to be introduced by the NRA only in a manner that protects the PSME equipment from interference. In particular, the APWPT draws the attention of the RSPG and the EC to the issues of interference from LSA and the impact on the QoS. The remarks below are meant to be non-exhaustive and to create a dialogue with the RSPG and the NRA. The earlier these issues can be addressed, the better for the introduction of LSA in Europe.

## **1. Interference from LSA on PMSE must be avoided**

If LSA is introduced, it needs to be done right. The U.S. experience shows that it takes years to set up a system that works. Given the interference that LSA could cause in the different bands, there is no room for error. The APWPT is concerned that the LSA principle will lead to an interference with PMSE equipment that comes to life all of a sudden, especially in those countries where this equipment is license exempt or governed by a general license; PMSE equipment would lose this band if LSA users appear unannounced and claim the first right of use for their equipment.

This concerns in particular the UHF spectrum. In particular, given the long successful history of spectrum sharing with broadcast television, the technical advantages of the UHF TV band spectrum for PMSE, and the fact that other major markets support PMSE operations in the UHF TV bands, the APWPT believes that the UHF TV band is and remains the best spectrum choice for wireless microphones now and in the future. UHF TV band spectrum is uniquely suited for wireless audio uses based on its favourable combination of wavelength, low body absorption, shadowing, and low ambient noise.

PMSE equipment requires known, clean spectrum. Incumbent users, especially wireless microphones, require greater accuracy to accommodate the often fluid spectrum environment in which wireless microphones operate particularly with wireless-intensive large events. Thus in many cases, frequency coordinators conduct site surveys days or weeks before events to ensure they understand the ambient RF levels on channels contemplated for wireless microphones and complementary low-power broadcast auxiliary transmitters. The random introduction of unlicensed devices in fractional channels within broader UHF TV band channels through LSA already occupied by wireless microphones would result in an unpredictable and constantly changing RF environment unsuitable for high-profile PMSE operations. Unlicensed TV Band Devices (TVBDs), for instance, that would operate co-channel with protected incumbents may disrupt live or broadcast events, and may also present an acute threat to public safety should they prevent breaking news, announcements and alerts from being disseminated.

Placing new devices with PMSE in the same band could greatly increase the risk of interference related to intermodulation ("IMD") product, which occurs when multiple signals from different sources in close proximity combine to produce unwanted new signals, as well as creating interference related to out-of-band emissions from nearby TV band devices. Finally, LSA should

not be introduced by NRA in a way that it will hinder advances in spectral efficiency. High-density PMSE systems require a significantly lower noise floor than conventional wireless microphones to facilitate tighter spacing while minimizing IMD. Therefore, thorough studies of CEPT and other technical bodies may be required before LSA can be introduced in bands that PMSE uses.

## **2. While a “Data Base” approach for LSA is positive, it requires more thought**

The Commission document states that

*“In addition to conventional planning methods, cognitive radio technologies and their capabilities (geolocation databases, sensing, etc.) may have a role as enablers for sharing under the LSA approach.”<sup>2</sup>*

One potential solution for LSA is indeed that the NRA establishes a regulatory system ensuring that there is/are database(s) of all equipment with “real time” interference control. However, any registration database approach is still relatively new and no database has yet received final approval in any EU jurisdiction to operate as the principal means of interference avoidance. To-date, while there is reason to be optimistic, there is no real-world experience with the implementation of a registration database. Accordingly, NRA should proceed cautiously in implementing a database solution. Without going too much into the details, it will be absolutely critical that the NRA thoroughly evaluate and validate any proposed database administrators and their untested, complex system architectures. It is also imperative that the administrator be an impartial, neutral party rather than an interested provider of devices or technology that will have strong incentives to prohibit database access to incumbents and unaffiliated devices.

While the APWPT would hope that companies participating in the database proposal process would not engage in discriminatory, preferential treatment, as a matter of sound public policy, it is essential for the NRAs to ensure the impartiality of the chosen database administrator or administrators by requiring the administrator to be a neutral party unaffiliated, directly or indirectly, with any interested party. NRAs should also consider a designation of multiple entities to operate the database. Moreover, strong authentication as the most effective deterrent against security risks must also be adopted for the data bases. It will be upon the NRA to make these determinations. Database administrators are not policy makers and are not authorized to determine the substantive rights of LSA for the LSA participants.

Finally, the NRA need to ensure that the operator of the database is financially stable and provides its services to all band users at a reasonable rate. On the one hand, the database services should not set up financial obstacles and high fees for PMSE users that deter them from participating and from registering their devices in the database. On the other hand, an unreliable or financially unstable data base operator would be devastating for LSA. It will be upon the NRA to balance these factors ensure that the LSA works as intended. A potential solution could be that the NRA operates the database to ensure that it works and delivers the desired benefits.

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<sup>2</sup> See page 6 in the consultation document

### 3. QoS must always be ensured under any LSA arrangement.

The RSPG states on p. 8 of the Consultation document that

*“Under the LSA framework, the additional users are allowed to use the spectrum (or part of the spectrum) in accordance with sharing rules included in their rights of use of spectrum, thereby allowing all the authorized users, including incumbents, to provide a certain QoS.”<sup>3</sup>*

The criterion of a “*certain level of QoS* (Quality of Service)” gives rise to concerns because it is very vague. Much of the PMSE equipment needs to be on standby and ready to transmit 24 hrs. / 7 days a week. This is in particular true for wireless microphones, in-ear devices and cameras that are used for ENG (Electronic Newsgathering). In addition, this requirement for 24/7 readiness becomes more and more the standard for PMSE equipment that is used for ENG content production, conferences and tours. Equipment that is used for these purposes cannot cope with any interference from other devices. In addition, unforeseen technical problems or demand may force a frequency coordinator at a large sporting event, award ceremony, or concert to reassign equipment to new, previously unreserved frequencies for PMSE. Regardless of how the need arises, when new channels are needed immediately for urgent incumbent use there must be a mechanism to accommodate these users and set aside channels.

What are thus needed are pre-defined license conditions and clearly defined sharing arrangements, including sufficient reserved capacities for “emergencies” and near real-time updates and synchronization, between different users play to ensure a certain quality of service (QoS) and a minimum of interference from PMSE. The incorporation of near real-time updates and synchronization into these agreements will encourage the users of the bands to reserve channels only for the period of time they actually need to operate on the frequencies, promoting spectral efficiency by making channels more rapidly available for unlicensed use after the conclusion of a protected incumbent’s broadcast, production or event. The GSM-R sharing agreement of 2005 between DEF (Ministry of Defence) and ARCEP, the French regulator, that is described in the Consultation document (pp. 10/11), is a good example demonstrating how complicated the QoS issues are. The goal must indeed be “*ensuring predictable QoS for all rights holders and consumers*”<sup>4</sup>.

To sum up, the APWPT intends to address the LSA system actively and to provide industry-based alternative solutions.<sup>5</sup> The goal is to allow sharing, while at the same time safeguarding the PMSE rights as the incumbent users in accordance with footnote 5.296 of the ITU Treaty mentioning the use of ENG in the 470 to 790 MHz / 698 MHz band.<sup>6</sup>

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<sup>3</sup> See page 8 in the consultation document

<sup>4</sup> See page 21 in the consultation document

<sup>5</sup> See planned PMSE Workshop at European Microwave Week October 11, 2013:  
<http://www.apwpt.org/upcoming-events.html#710036a20d0ba8903>

<sup>6</sup> See RESOLUTION COM5/10 (WRC-12) and the footnote 5.296: “*Additional allocation: in Albania, Germany, Saudi Arabia, Austria, Bahrain, Belgium, Benin, Bosnia and Herzegovina, Burkina Faso, Cameroon, Congo (Rep. of the), Côte d'Ivoire, Croatia, Denmark, Djibouti, Egypt, United Arab Emirates, Spain, Estonia, Finland, France, Gabon, Ghana, Iraq, Ireland, Iceland, Israel, Italy, Jordan, Kuwait, Latvia, The Former Yugoslav Republic of Macedonia, Libya, Liechtenstein, Lithuania, Luxembourg, Mali,*

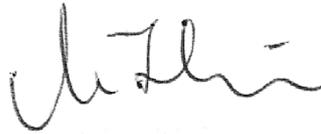
Many countries in Region 1 (EMEA) have agreed on this footnote during WRC-12 for Region 1. The APWPT could imagine a similar solution endorsing the use of PMSE in certain bands during WRC-15. In order to reach these goals, the APWPT and its members actively participate in Joint Task Group 4-5-6-7 (JTG 4-5-6-7) - WRC-15 Agenda items 1.1 and 1.2, in particular Sub Working Group 2.3 on SAB/SAP where the APWPT holds the chair.<sup>7</sup> In view of these on-going international activities and deliberations, the NRA should not pre-empt any industry-based solutions by prematurely adopting LSA concepts that are not fully supported by the ITU /CEPT bodies and all relevant industry sectors.

APWPT will be pleased to continue the dialogue with the RSPG on these issues.

Respectfully submitted,



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*Malta, Morocco, Moldova, Monaco, Niger, Norway, Oman, the Netherlands, Poland, Portugal, Qatar, the Syrian Arab Republic, Slovakia, the Czech Republic, the United Kingdom, Sudan, Sweden, Switzerland, Swaziland, Chad, Togo, Tunisia and Turkey, the band 470-790 MHz, and in Angola, Botswana, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Zambia and Zimbabwe, the band 470-698 MHz are also allocated on a secondary basis to the land mobile service, intended for applications ancillary to broadcasting. Stations of the land mobile service in the countries listed in this footnote shall not cause harmful interference to existing or planned stations operating in accordance with the Table in countries other than those listed in this footnote. (WRC-12)" Source:*

[http://www.itu.int/dms\\_pub/itu-s/oth/02/02/S02020000244501PDFE.pdf](http://www.itu.int/dms_pub/itu-s/oth/02/02/S02020000244501PDFE.pdf)

<sup>7</sup> <http://www.itu.int/ITU-R/index.asp?category=study-groups&mlink=jtg4-5-6-7&lang=en>