PMSE
Nederlandse Belangenvereniging
Draadloze A/V Verbindingen
Programme Making & Special Events

Radio Spectrum Policy Group – Secretariat
DG CNECT B4: Spectrum – Office: BU33 7/065
European Commission, B-1049 Bruxelles, Belgium

RESPONSE of PMSE.NL

To RSPG public consultation on the Draft Opinion on a long-term strategy on future spectrum needs and use of wireless audio and video PMSE applications.

PMSE.NL welcomes the opportunity to provide input to RSPG on this Consultation, proceedings that marks an important and necessary effort to identify additional new spectrum for Programme Making and Special Events ("PMSE") in the European Union.

The RSPG was asked to advise the European Commission on a long-term strategy on wireless audio and video PMSE spectrum use and requirements. The association Program making and Special Events.NL (further named as PMSE.NL) is pleased that the European Commission asked the RSPG to develop an Opinion on a mid- to long-term strategy for PMSE and also appreciates the RSPG accepting the request. The opinion focuses on the challenges of satisfying peak demand requirements.
However, the suggested plans will require further coordination and discussions with the incumbent band users, other national and EU regulators, and bodies dealing with spectrum matters. PMSE.NL supports a coordinated, systematic approach to explore the PMSE opportunities and to find mutually acceptable solutions to obstacles. The members of PMSE.NL include broadcasters, production firms, theater, events, film industry, and other users. We feel that international coordination is necessary for better spectrum in cross border situations. We do not feel that the solution will come from national authorities only.

Our remarks:

1. **<u>PMSE plays a critical role in the national and international economy, culture, and everyday life; the negative impact of the expected PMSE spectrum shortfall will be widespread.</u>**

   Wireless microphones are critical production tools essential to activities in many sectors—broadcast, entertainment, music- and sporting events as outlined in the

Consultation. In addition to content production, wireless tools ensure occupational safety and security, especially in the case of 'moving' productions. Many productions can not be wired of require a mix of wired and wireless equipment.
PMSE.NL would add that today audio PMSE is also important to commercial, educational, civic, religious events and (news) gatherings. PMSE use has increased across all sectors and is now embedded in many facets of everyday life. As such, ensuring that users and audiences across these various applications can continue to rely on high-quality audio PMSE is a matter of economic, cultural, and civic concern.

2. **PMSE.NL welcomes thoughtful work to date exploring potential new spectrum resources suitable for sharing with PMSE. Targeted spectrum should be free from interference and not slated for reallocation to other services.**

Wireless microphones have made excellent use of available spectrum resources. This is based on existing coordination tools and methods. PMSE has successfully shared spectrum with other services for many years, well before spectrum sharing became the focus of national policies. For decades, wireless microphones have shared spectrum with TV broadcasters, and, depending on the jurisdiction, other services without any known interference incidences. Further, manufacturers have pushed technical advances to achieve significant gains in spectral efficiency and wireless microphone channel counts per megahertz continue to increase. However, production demands for spectrum are high and expanding every year; interference, latency or too little spectrum significantly undermines PSME services by restricting the ability to increase channel counts, and/or by degrading quality thereby frustrating both PMSE users, and the millions in the live, televised and online audiences who expect flawless, crystal clear audio for all professional productions.

Technological developments and regulatory requirements could contribute to meet the spectrum demands and quality of service demands for wireless audio and video PMSE. Shared use of spectrum, which could include appropriate and innovative sharing approaches e.g. the availability of geo-location, a higher level of certainty than a framework of non-interference and non-protection accessibility of spectrum in identified cases, as well as a common approach on authorizations and opportunities of localized temporary shared use of spectrum in case of large spectrum needs. PMSE applications typically share spectrum with other services based on sharing criteria, primarily defined to protect these other services from mutual interference. We think that sharing possibilities between applications (as with the Licensed Shared Access for PMSE video in the Netherlands) bring solutions for sharing on a peak-demand bases.

3. **<u>The RSPG should weigh the possibility of harmonization between countries' regulations.</u>**

   The RSPG should also pay close attention to the impact this proceeding will have on the international level. PMSE.NL does not feel that identified national needs can be satisfied better on national level according to national circumstances. Often, we see in the report the remark that frequencies could be subject to some evolution of use at national level. The RSPG-report is to advise the European commission on a long-term strategy on wireless audio and video PMSE spectrum use and requirements. A clear directive on international, European, tuning ranges will hopefully lead to manufacturers, producing for PMSE markets, making standardized equipment instead of equipment exclusively produced for individual countries. PMSE.NL recommends taking into account ITU (region 1) recommendations.

   The report states that requirements in peak demand situations, due to the local and temporary nature of PMSE, are best addressed on a case-by-case basis at a national level using the "tuning range concept" developed by CEPT. PMSE.NL strongly feels this is no solution for limited availability of spectrum. In practice, if there's no or less spectrum available the PMSE market cannot 'borrow' from other services. Equipment is often limited to a single market solution, due to national spectrum regulatory differences. For manufacturers this current situation makes it difficult to develop equipment that can be used in all countries in the EU. Coordination is necessary.

4. **<u>The PMSE industry has already reaped the benefits of skilled frequency planning and digital techniques.</u>**

   The Consultation suggests that PMSE users can address the spectrum shortfall by improvements in central planning and frequency management "on the ground" as well as by incorporating digital techniques. The PMSE community is populated with many professional frequency coordinators and producers highly skilled and experienced in the task of providing audio PMSE support to the complex broadcast, entertainment, sports and other productions that are typical in today's production environment. Today, these professionals work cooperatively across different venues and productions to balance competing demands for PMSE spectrum. The everyday examples of events are daily business with a lot of areas with more request (especially more than the suggested 60MHz for Audio PMSE). PMSE-users are already requiring sophisticated skills, technologies, and extensive consultation among the stakeholders.
   Digital techniques also are not a simple cure to spectrum scarcity. Clean, interference free spectrum must be available in order for users to reap the full

potential of spectrum efficiencies made available by digital techniques. Without clean spectrum, the potential for alleviating spectrum congestion through the use of digital technology is limited. PMSE users cannot realize the full potential for efficiency and an expanded channel count even with digital equipment if, for example, it is operating in a noisy duplex gap situated between LTE or other signals.

5. Useable spectrum

Another important aspect of these sharing arrangements is that the spectrum is able to provide the high quality of service required for live events and programme making. 'High quality' in this context does not only mean increasing demands on content quality, but also high demands on radio spectrum quality. There has been substantial growth in the use of wireless PMSE in the last decade and decrease of useful spectrum in the same time span. PMSE equipment operators are already reporting a capacity crunch at daily normal events, especially in cross-border coordinated area's.
The loss of the 700 MHz band for PMSE users is already "a challenge". After the 700 MHz action, the frequency loss for audio PMSE is at least 50%. A further review of the UHF band in 2023 could mean the industry loses even more spectrum in the future. Stable spectrum is needed for the industry to focus on in the foreseeable future. Companies (production teams, PMSER manufacturers and users and their service providers) make investment decisions based on forecasts of return on investments. At this moment the manufacturers of PMSE equipment are reluctant to develop UHF equipment and the same goes for developing equipment for other spectrum, due to the lack of directives on which spectrum is of will be available in the near future.
Although the present document covers all spectrum, PMSE.nl emphasizes that multi-channel audio PMSE systems used in professional productions are best suited to spectrum under 2 GHz for reasons of propagation and body interaction.
The RSPG document suggests that tuning ranges will solve planning's issues. PMSE.NL emphasizes that tuning ranges of equipment give no guaranty on usable spectrum. Further information on audio PMSE is available in ECC Report 204 [i.15].

Given the importance of the audio and video PMSE industries in the production of European content, it is essential that certainty over future spectrum access is offered in order to ensure continued high quality productions. European content is exported worldwide and the substantial financial returns generated by production of this content should not be allowed to be constrained by either financial or spectrum related pressures. Political decisions too often change the framework conditions. Therefore, the enthusiasm for further investments is limited.

6. **Technical solutions alone will not solve spectrum shortage.**

   An increase in the use of PMSE equipment does not necessarily mean that the use of spectrum should also increase. But a loss of spectrum (e.g. the UHF band) will not be solved by new technology. In the longer term, perhaps new technology will help. However, new technology presents regulatory and standardization challenges that must be overcome before equipment can be placed on the market and adopted by PMSE operators.

7. **Solution in Cognitive-PMSE**

   The most important objective in the C-PMSE project is the preservation and possibly increase of the operational reliability under the conditions of dynamic and heterogeneous frequency utilization. The result of this research project is (summarized) that it is possible to maintain production quality even in case of disturbances., if you can quickly switch to undisturbed frequencies. This results in a higher frequency requirement for production. The basic idea is, to scan continuously the usable frequency range against potential risks. As soon as potential interferers are detected, countermeasures will be initiated. The basic principle sounds quite easy, but it requires very complex interactions between different components and different stake-holders. Equipment with the specifications needed is not yet available on the market or is still under research. The results of tests witch a large amount of channels are not impressive.

8. **Video PMSE**

   Wireless camera equipment that is more spectral efficient, might be developed and be available within the next few years, with codec technology improving roughly in step with the demand for increasing resolution. (Please note that spectral efficiency does not automatically lead to technically better video quality).Codec technology gives latency in a video stream. In live broadcast situations, the latency and battery-use will become an issue. We think there is still a need to have spectrum for wireless camera's (especially needed for Ultra HD). The development in the area of 5G should be monitored, because this could have an impact on the long-term bandwidth needs of extra spectrum for video PMSE and multichannel audio PMSE. PMSE.NL does not feel the implementation of 5G technology alone will eliminate the problem of undisturbed production frequencies. The telecom networks provide at this moment on large events not the high quality of service required for live events and programme making. There's also a risk of overloaded network and capacity problems

in case of calamities. We agree that there is a new use in situations as point-to-point delivery of video and audio but this is not reliable in peak-demand situations.

9. **Extraordinary circumstances**

PMSE.NL strongly recommends that the RSPG maintains the possibility of PMSE use (audio and video) of spectrum that is not clearly designated to PMSE, in extraordinary circumstances. This is necessary to meet specific short-term peak demand locally (e.g. national disasters), but also cross-border (e.g. for large international (sport)events. Obviously PMSE users will only make use of this additional spectrum if possible and appropriate.

Yours faithfully,

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President of PMSE.NL

Representing our members:

Ampco Flashlight, Utrecht
Audio Electronics Mattijsen BV, Duivendrecht
Audio XL, Utrecht
Broadcast Rental bv, Hilversum
De Herrieboerderij, Duivendrecht
Facility House, Hilversum
Focus Amsterdam, Amsterdam
H.F. Prints, Lelystad
Hoens Broadcast Facilities B.V., Loosdrecht
Iemke Roos Audio BV, Amsterdam
Monacor Nederland BV, Malden
Nederlandse Associatie voor Podiumkunsten, Amsterdam
NOS, Hilversum
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Nederlandse Publieke Omroep, Hilversum
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O.L.O.N., Nijmegen
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