Your response

Question	Your response
Question 1: Do you have comments on the overall approach to the review?	Confidential? – N APWPT, the European organization representing the PMSE sector, appreciates this opportunity to comments with OFCOM. APWPT, together with BEIRG, has provided input to Ofcom on several occasions in the past.[1] 1. "PMSE" (Programme Making and Special Events") enables the creation of audio and video content in various frequency bands which is intended for reception by the general public using a variety of platforms. PMSE comprises the "use of terrestrial portable and transportable radio equipment by services ancillary to broadcasting and programme making (SAB/SAP) including electronic field production, TV outside broadcast, wireless microphones and outside production and broadcast, commonly described as electronic news gathering (ENG)", as further defined by the ITU (e.g. in Resolution 59-2 (WRC-19).[2]). PMSE content capture takes place at the front end of every production and is the start of the supply and value chains for a wide range of products, such as recordings of live performances or the archiving of culturally significant material. PMSE enables the creation of audio and video content which is intended for reception by the general public. A variety of platforms distribute this content including terrestrial broadcast, streaming broadcast and, in case of a live events, directly to the audience via a public address system. Therefore, PMSE plays an important role for – The social cohesion and citizen-ship; – Supporting education and learning; – Allowing creativity and cultural ex-cellence; and

[1] https://www.ofcom.org.uk/__data/assets/pdf_file/0029/57935/association_of_professional1.pdf
[2] Available at https://www.itu.int/pub/R-RES-R.59-2-2019

– Capturing peoples' opinions, statements and debates.

For these reasons, safeguarding the quality and reliability of the radio link are fundamental to PMSE. For live PMSE production, undisturbed radio links are required as the moment to be captured cannot be repeated.

To sum up, is very important that any frequency spectrum change be discussed intensively and "before it happens" with the stakeholders for developing a detailed spectrum management plan. We therefore fully support the input provided by BEIRG as an UK based organization that cooperates closely with the APWPT.

2. OFCOM states in Section 2.24 of the Consultation Document: *"This strategy review does not aim to review the future spectrum demands of specific sectors in detail or review the potential future use of specific bands. This is because we separately undertake in-depth sector spectrum reviews, for example for the space, mobile, transport and PMSE (Programme Making and Special Events) sector."* – We respectfully disagree. Ofcom should consider PMSE and its spectrum demands in this Review. The demand for PMSE for content creation for (actual and virtual) events is growing rapidly and PMSE equipment is used in various bands.

3. PMSE is used across the border and its equipment is not manufactured for individual countries. Therefore, APWPT would appreciate it if OFCOM coordinates its approach affecting PMSE with other regulators as it has successfully done it in the past. A harmonized approach for the long-term spectrum policy is in everyone's interest. Especially, the UHF TV band within 470-694 MHz is the primary band for professional wireless audio-PMSE operation globally. We encourage Ofcom to safeguard access to this band for the foreseeable future. This part of the UHF band is the core band for the low power professional PMSE applications due to its physical characteristics (e.g. coverage and body absorption). Ofcom should not adopt measures that change the seamless

	cooperation between PMSE providers, content producers and the broadcasters in this band. 4. Another reason to consider PMSE is that any harmful interference to the low power devices used for PMSE will have an immense influence on the quality of the complete production, such as live broadcasts, religious gatherings, government meetings, cultural and sporting events, and business conferences, etc. All these events are increasing in numbers and quality to deliver the expected user experience, and this content production demands a high volume of interference-free spectrum. Recent experience during the COVID pandemic has shown that the need for PMSE has not dropped thanks to the various online events that require PMSE devices. 5. Ofcom should not overvalue the future technologies that Ofcom describes in **Annex 6** (AI, 6G, Blockchain, super high frequencies…) as they may simply not hold what they promise. Rather, Ofcom should focus on existing technologies, such as PMSE and its innovations, and determine how they can be deployed in the most innovative and efficient matter. For example, for more than 50 years, PMSE (SAB/SAP/ENG) has efficiently shared the 470-862 MHz with the primary service, DTT broadcast and is a role model how distinct wireless services can cooperate and "live" together to use the finite resource of spectrum efficiently.
Question 2: Have we captured the major trends that are likely to impact spectrum management over the next ten years?	Confidential? – N APWPT would appreciate if OFCOM coordinates its approaches affecting PMSE with other regulators as it has successfully done it in the past. OFCOM is certainly aware that PMSE is used across the border and its equipment is not manufactured for individual countries only. APWPT welcomes that OFCOM plans to be actively involved in international working groups. The international ITU-R organization is discussing the future of the UHF-TV plan and plans to discuss opinions at World Radio

	Conference 2023. As we understand their plans, the ITU-R does not mandate the use of spectrum but is setting the mindset for the future after 2030. As the UHF-TV band is the core band for audio-PMSE equipment, it is highly important that the frequency spectrum plan identifies PMSE as one of the important services and applications needing spectrum access to this portion of the spectrum. PMSE's core band is the UHF-TV band, but as demand is growing PMSE is looking into different frequency bands and different technologies, e.g. the band 960 – 1164 MHz. One important technology not mentioned in your consultation is DECT2020, which is applying for IMT2020 listing, a technology, which seems to show some advantages compared to 5G at this time. Therefore, it is important for PMSE that the current DECT band 1880 – 1900 MHz is secure as BEIRG describes it in more details in its comments. We cannot predicted, if and when the new communication technologies like 5G, 6G or DECT2020 are able to support the quality requirements for all different PMSE applications, but in any case PMSE users need reliable spectrum access to be able to deploy PMSE systems and equipment. APWPT is of the view that OFCOM should not focus on IMT identification for each individual band in question but should rather support all mobile technologies and innovative sharing methods.
Question 3: Could any of the future technologies we have identified in Annex 6, or any others, have disruptive implications for how spectrum is managed in the future? When might those implications emerge?	Confidential? – N APWPT welcomes OFCOM's strategy for spectrum sharing, as PMSE has been doing that for more than 60 years. The RSPG opinion on spectrum sharing is highly relevant as it discusses the different options. [3] The RSPG notes that such a frequency management

[3] Documents available at https://ec.europa.eu/digital-single-market/en/promoting-shared-use-europes-radio-spectrum

	decision has to be made for every frequency band on a separate basis. Ofcom has spectrum management tools in place organizing the use of the UHF-TV band between DVB-T, PMSE and TVWSD. This approach works very well as it also describes the level of protection supporting the required QoS. DVB is primary, PMSE and TVWDS are secondary user, while PMSE is protected against harmful interference from TVWSD. APWPT agrees with Ofcom that automated spectrum sharing could provide for more flexibility and dynamic licensing. However, Ofcom should be mindful of the enormous challenges that BEIRG describes in its comments for the U.K. Introducing any sharing technology will result in additional costs and complexity. Further, not all its functions and corresponding benefits will be relevant in every case. Sometimes less costly and/or complex alternatives may already exist (cf. Section 6.21 of the Consultation Document). We encourage Ofcom to work closely with the APWPT and BEIRG to determine when and where it will make sense to deploy spectrum sharing, focusing on bands where it is most relevant and can bring the greatest benefits. A "*stand-alone technology […] reducing the assignment duration from 15 minutes down to near-real time*" (Sec. 6.15) alone would likely not solve all the issues. Most importantly, a workable spectrum sharing data base will require significant investments that the PMSE industry and the PMSE users may not be able to shoulder. Learning from the experience of other regulators, such as the Federal Communications Commission in the United States will avoid costly mistakes. Further studies may be needed.
Question 4: Do you agree that there is likely to be greater demand for local access to spectrum in the future? Do you agree with our proposal to consider further options for localised spectrum access when authorising new access to spectrum?	Confidential? – N PMSE devices are typically low power devices. While fixed installations can be planned the major of PMSE devices are used nomadically. The use of frequency spectrum does change every day in time, location and in amount of needed spectrum.

	PMSE traditionally accesses localised spectrum (usually in small geographical areas like stadiums, venues, theatres, conference halls, etc.) to support their connectivity needs. Typically, the local spectrum management between different PMSE applications and equipment is performed locally at the event, using the frequency management tools provided by the manufacturers of the equipment. This local spectrum management is highly important as PMSE equipment needs interference free spectrum to be able to support the requirements based on the user's expected quality. The temporary character of PMSE applications requires portable, self-contained, flexible networks, that can be installed on-demand quickly and easily. APWPT agrees that local options for accessing spectrum are likely to be increasingly important in the future. Many industrial sectors are expressing their wish for retaining their sovereignty in terms of infrastructure, data and services. Access to dedicated local spectrum plays a decisive role to avoid the gatekeeping involvement of 3rd party operators. Local licences in bands supporting (PMSE) mobile technology can also support innovation in the mobile supply chain. APWPT welcomes OFCOM's proposal to support the growing diversity of wireless services and providers by considering further options for localised spectrum access when authorising new access to spectrum. APWPT agrees that there is a need for carefully considering the geographic extent of licences (local vs. regional vs. national). Furthermore, APWPT firmly believes that there is an additional need for carefully considering the temporary extent of local licenses in order

	to allow for short-term planned and sporadic (nomadic) spectrum use, when authorising new access to spectrum. Spectrum policy should neither foster nor tolerate gatekeeping behavior that may stifle innovation.
Question 5: Do you agree with the actual and perceived barriers identified for innovation in new wireless technologies, and our proposed ways of tackling those?	Confidential? –N APWPT agrees, however with reducing the barriers to allow the innovation in new technologies, no additional constraints should be imposed on the existing users in a frequency band. The operational requirements of new users need to be assessed and balanced against those of the existing users in the same or adjacent frequency bands. The spectrum and operational needs of sectors and wireless applications with specialised requirements such as the PMSE sector need to be reflected when reducing the barriers for new wireless technologies.
Question 6: Do you agree with Ofcom's proposals to improve our outreach and reporting activities, and spectrum information tools? • **Are there additional ways that Ofcom could better engage with existing and future users and providers of wireless communications?** • **Please explain any specific areas where you believe more or better provision of information could provide value to stakeholders**	Confidential? – N APWPT agrees in general, however, while making spectrum available to future users and technologies, OFCOM should keep its focus on the protection of the existing spectrum users. Based on the gathered information OFCOM should develop guidance for future spectrum users how to use spectrum efficiently and how to avoid harmful interference into existing users in the same or neighbouring bands. This information will help future users and technologies to fit within the existing spectrum situation. The operational needs of the various sectors and wireless applications with specialised requirements (e.g. PMSE sector) must always be clearly communicated to the present and future spectrum users: To repeat our earlier comment: The PMSE sector requires interference free spectrum for their operation.
Question 7: Do you agree that it is important to make more spectrum available for innovation before its long-term use is certain? Do you have any comments about our proposed approach to doing this?	Confidential? – N APWPT agrees with the general need for spectrum for new technologies. To drive innovation, it is beneficial to make more spectrum available, even before the long-term

	use is certain. Spectrum should be made available on a short-term basis to them to prove the technical viability of such innovations. However, for industry in specific sectors such as PMSE it is important to have a clear perspective on the mid and long-term available spectrum. This perspective and guidance is required by PMSE manufacturers to invest in the development and manufacturing of new innovative equipment. A clear perspective on the future available spectrum is also necessary for the decision-making of the PMSE users whether and when to invest in new equipment. Please see also response to Q1.
Question 8: Do you agree that it is important to encourage spectrum users to be 'good neighbours' to ensure more efficient use of the spectrum? Do you agree with our proposals to: **a) increase realism in coexistence analysis at a national and international level?** **b) encourage spectrum users to be more resilient to interference?** **c) ensure an efficient balance between the level of interference protection given to one service and the flexibility for others to transmit?** **Do you have any comments on which of these will be the most important?**	Confidential? – N APWPT agrees with OFCOM's view, however, the efficient balance between the level of interference protection and the flexibility for others to transmit in a band depends on the users, services and applications in a specific frequency band. PMSE applications require interference free spectrum to be able to provide the expected quality of service. Therefore, any balanced regulatory approach must consider the needs of the spectrum users in detail. The evaluation process and its outcome might be different for every frequency band. Please also see BEIRG's response to this Question.
Question 9: Are there any other issues or potential future challenges that should be considered as part of this strategy?	Confidential? – N Please see our response to Question 1 and BEIRG's detailed response.
Question 10: Do you agree that continued use of our existing spectrum management tools (as set out in sections 4-7) will be relevant and important for promoting our objectives in the future, in light of future trends?	Confidential? – N OFCOM has investigated new frequency management tools and invested into innovative systems in the past. APWPT supports OFCOM to continue with that approach which might require a review of the

	tools every few years to be able to modify it for determining the best use cases.
Question 11: Is there anything else we should be considering doing, or doing differently, to promote our objectives?	Confidential? – N Nothing to report.