instructions were to improve the quality of information initially collected and to make the permit process more efficient.

Affected Public: Individuals; Business or other for-profit organizations; Not-for-profit institutions; State, Local, or Tribal government; Federal Government.

Frequency: On occasion.

Respondent's Obligation: Required to Obtain or Retain Benefits.

Legal Authority: National Marine Sanctuaries Act, 16 U.S.C. 1431 *et seq.*

This information collection request may be viewed at *https://www.reginfo.gov.* Follow the instructions to view the Department of Commerce collections currently under review by OMB.

Written comments and recommendations for the proposed information collection should be submitted within 30 days of the publication of this notice on the following website *https://www.reginfo.gov/public/do/PRAMain.* Find this particular information collection by selecting ''Currently under 30-day Review—Open for Public Comments'' or by using the search function and entering either the title of the collection or the OMB Control Number 0648–0141.

Sheleen Dumas,

Departmental PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2024–24702 Filed 10–23–24; 8:45 am]

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XD212]

2024 Updated Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing—Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts (Version 3.0)

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice.

SUMMARY: The National Marine Fisheries Service (NMFS) announces the availability of our final *2024 Update to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 3.0): Underwater and In-Air Criteria for Onset of Auditory Injury and Temporary Threshold Shifts* (2024 Updated Technical Guidance). The 2024 Updated Technical Guidance provides updated information, or acoustic criteria, to predict when individual marine mammals, both in-air and underwater, will experience changes in their hearing sensitivity (auditory injury or temporary threshold shift) from exposure to anthropogenic sound sources. The 2024 Updated Technical Guidance replaces NMFS's current *2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts* (2018 Revised Technical Guidance).

ADDRESSES: The final 2024 Updated Technical Guidance is available in electronic form via the internet *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.*

FOR FURTHER INFORMATION CONTACT: Amy R. Scholik-Schlomer, Office of Protected Resources, 301–427–8449, *Amy.Scholik@noaa.gov.*

SUPPLEMENTARY INFORMATION: NMFS has updated its guidance for assessing the effects of anthropogenic sound on the hearing of marine mammal species under NMFS's jurisdiction. Specifically, the 2024 Updated Technical Guidance identifies the received levels and auditory weighting functions, or ''acoustic criteria,'' that describe the received levels (decibels (dB)) and frequencies (kilohertz (kHz)) where individual marine mammals are predicted to experience changes in their hearing sensitivity (auditory injury (AUD INJ) or temporary threshold shift (TTS)) from exposure to anthropogenic sound sources both in-air and underwater. This document is intended for use by NMFS analysts and managers and other relevant user groups and interested parties, including other Federal agencies, when seeking to determine whether and how their activities are expected to result in auditory impacts to marine mammals via acoustic exposure in-air and underwater. The 2024 Updated Technical Guidance outlines NMFS's updated acoustic criteria and describes in detail how they were developed and how they will be updated in the future. For information on NMFS' 2018 Revised and the original 2016 Technical Guidance, refer to our 2016 **Federal Register** notification (81 FR 51694, August 4, 2016).

For the 2024 Updated Technical Guidance, NMFS again worked with the U.S. Navy (Navy), which recently updated its marine mammal AUD INJ and TTS criteria (Finneran 2024), to incorporate the best available science. NMFS conducted an independent peer review in October/November 2022. Details of the peer review, peer reviewer comments, and our response to these comments are available at the following website: *https://www.noaa.gov/information-technology/update-to-20162018-technical-guidance-for-assessing-effects-of-anthropogenic-sound-on-marine-mammal.* In May/June of 2023, NMFS solicited input from other relevant Federal agencies on the 2024 Updated Technical Guidance. Federal agency comments and NMFS responses to those comments are available at the following website: *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance.* To complete the review process, NMFS solicited additional feedback from user groups and interested parties via a 45-day public comment period in May/June 2024. Comments received via the public comment period can be found at the following website: *https://www.regulations.gov/document/NOAA-NMFS-2024-0026-0001.*

It is important to note that the use of the acoustic criteria within the 2024 Updated Technical Guidance should not be considered to represent the entirety of an impact assessment, but rather serve as one tool to help evaluate the effects of a proposed action. Furthermore, the 2024 Updated Technical Guidance does not create or confer any rights for or on any person, or operate to bind the public. For the purposes of assessing auditory impacts to marine mammals in support of regulatory processes under NMFS' authority, an alternative approach that has undergone independent peer review may be proposed (by Federal agencies or prospective action proponents or applicants) and used if case-specific information/data indicate that the alternative approach is likely to produce a more accurate portrayal of auditory impacts (AUD INJ or TTS) for the project being evaluated, if NMFS determines the approach satisfies the requirements of the applicable statutes and regulations.

The 2024 Updated Technical Guidance reflects the current state of scientific knowledge regarding the characteristics of sound that have the potential to impact marine mammal hearing sensitivity. NMFS recognizes that the implementation of marine mammal weighting functions and the weighted SEL_{24h} criteria may extend beyond the capabilities of some action proponents. Thus, NMFS has developed an optional, alternative tool for those

who cannot fully incorporate these factors into their own analyses (See 2024 Updated Technical Guidance's companion optional User Spreadsheet tool; *https://www.fisheries.noaa.gov/national/marine-mammal-protection/marine-mammal-acoustic-technical-guidance*).

Transitioning to 2024 Updated Technical Guidance

NMFS has determined the updated thresholds and associated weighting functions in the 2024 Updated Technical Guidance represent the best available information for assessing whether exposure to specific activities is likely to result in changes in marine mammal hearing sensitivity (AUD INJ or TTS). Prospective applicants for incidental take authorizations under the Marine Mammal Protection Act (MMPA) and Federal agencies seeking Endangered Species Act (ESA) section 7 consultations that have not yet started their acoustic analyses should begin using the 2024 Updated Technical Guidance immediately. At the same time, we recognize that for some proposed actions, analyses may have already substantially progressed using the existing criteria in the 2018 Revised Technical Guidance or other methods for assessing hearing effects, and it may be impractical to begin those analyses anew, taking into account timing constraints, expense, and other considerations. In such ''pipeline'' cases, the applicant or action agency should contact NMFS as soon as possible to discuss how to best include consideration of the 2024 Updated Technical Guidance to satisfy the applicable requirements. A non-exhaustive list of factors that could affect the extent to which the 2024 Updated Technical Guidance will be quantitatively incorporated for an action include: The relative degree to which the 2024 Updated Technical Guidance is expected to affect the results of the acoustic impact analyses; how far in the process the application or prospective application has progressed; when the activity is scheduled to begin or other timing constraints; the complexity of the analyses and the cost and practicality of redoing them; and the temporal and spatial scope of anticipated effects. We anticipate that after the initial transition period, all applications for MMPA incidental take authorization and all requests for ESA section 7 consultations involving noise that may affect marine mammal hearing will include full consideration of the 2024 Updated Technical Guidance.

Regulatory Context

NMFS uses acoustic criteria to help quantify ''take'' and as part of more comprehensive effects analyses under several statutes. The 2024 Updated Technical Guidance's acoustic criteria do not represent the entirety of the comprehensive effects analysis, but rather serve as one tool among others (*e.g.,* behavioral impact criteria, auditory masking assessments, evaluations to help understand the ultimate effects of any particular type of impact on an individual's fitness, population assessments, etc.) to help evaluate the effects of a proposed action and make findings required by NMFS' various statutes.

Under current agency practice, NMFS considers the onset of auditory injury as an example of ''Level A Harassment'' as defined in the MMPA and as ''harm'' as defined in ESA regulations, such that exposing an animal to weighted received sound levels at or above the indicated permanent threshold shift (PTS) threshold is predicted to result in these two types of ''take'' (*i.e.,* Level A Harassment under the MMPA and harm under ESA).

As explained below, NMFS does not consider a TTS to be an auditory injury under the MMPA or ESA, and thus it does not qualify as Level A harassment or harm. Nevertheless, TTS is an adverse effect that historically has been treated as ''take'' by ''Level B Harassment'' under the MMPA and ''harassment'' under the ESA.

Marine Mammal Protection Act

The MMPA prohibits the take of marine mammals, with certain exceptions, one of which is the issuance of incidental take authorizations (ITAs). Sections 101(a)(5)(A) & (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made. Through delegation by the Secretary of Commerce, NMFS is required to authorize the incidental taking of marine mammals if the agency finds that the total taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for certain subsistence uses. NMFS must also set forth the permissible methods of taking and requirements pertaining to the mitigation, monitoring, and reporting of such takings. (The ''small numbers'' and ''specified geographical region'' provisions do not apply to military readiness activities.)

The term ''take'' means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal. 16 U.S.C. 1362(13).

Except with respect to certain activities described below, ''harassment'' means any act of pursuit, torment, or annoyance which:

- Has the potential to injure a marine mammal or marine mammal stock in the wild *(Level A Harassment);* or
- Has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding or sheltering *(Level B Harassment).*

See id. at 1362(18)(A)(i) & (ii) (emphasis added).

Congress amended the definition of ''harassment'' as it applies to a ''military readiness activity'' or research conducted by or on behalf of the Federal government consistent with MMPA section 104(c)(3) as follows (section 3(18)(B) of the MMPA):

- Any act that injures or has the significant potential to injure a marine mammal or marine mammal stock in the wild *(Level A Harassment);* or
- Any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavioral patterns, including, but not limited to, migration, surfacing, nursing, breeding, feeding, or sheltering, to a point where such behavioral patterns are abandoned or significantly altered *(Level B Harassment).*

See id. at 1362(18)(B)(i) & (ii) (emphasis added).

The term ''negligible impact'' is defined as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival. 50 CFR 216.103.

In support of the analysis that is necessary to make the required statutory determinations, MMPA implementing regulations require ITA action proponents to provide NMFS with specific information. Although they may also be used to inform the development of mitigation measures, the updated acoustic criteria are particularly relevant to the following 2 of the 14 required pieces of information:

- The *type* of incidental taking authorization that is being requested (*i.e.,* takes by Level B Harassment only; *Level A Harassment;* or serious injury/

mortality) and the method of incidental taking; and

• By age, sex, and reproductive condition (if possible), the *number* of marine mammals (by species) that may be taken *by each type* of taking identified in paragraph (a)(5) of this section, and the number of times such takings by each type of taking are likely to occur. 50 CFR 216.104 (emphasis added).

Endangered Species Act

Section 9 of the ESA prohibits the take of ESA-listed species, with limited exceptions. Section 7 of the ESA requires that each Federal agency, in consultation with NMFS and/or the U.S. Fish and Wildlife Service (USFWS), ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. *See* 16 U.S.C. 1536(a)(2). Provided that NMFS or the USFWS reaches these conclusions through a ''formal consultation'' process, incidental take of ESA-listed species may be exempted from the section 9 take prohibition through an ''incidental take statement'' that must specify the impact, *i.e.,* the amount or extent, of the taking on the species. *See id.* at section 1536(b)(4). Incidental take statements must also include reasonable and prudent measures necessary or appropriate to minimize the impact, and the terms and conditions required to implement those measures.

Under ESA, ''take'' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. *See id.* at section 1532(19). ''Harm'' is defined in NMFS regulations as ''an act which actually kills or injures fish or wildlife'' (and can include significant habitat modification or degradation). *See* 50 CFR 222.102.

Under NMFS and the USFWS implementing regulations for section 7 of the ESA, ''jeopardize the continued existence of'' means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species. *See id.* at § 402.02.

In support of the analysis necessary to conduct the consultation, the ESA implementing regulations state that in order to initiate formal consultation, the Federal action agency must submit a written request for formal consultation to the Director (of NMFS or the USFWS) that includes, among other things, a description of the manner in which the action may affect any listed species. *See id.* at § 402.14(c).

Application of Acoustic Criteria for Auditory Injury

The acoustic criterias for AUD INJ will be used in conjunction with sound source characteristics, environmental factors that influence sound propagation, anticipated marine mammal occurrence and behavior in the vicinity of the activity, as well as other available activity-specific factors, to quantitatively estimate (acknowledging the gaps in scientific knowledge and the inherent uncertainties in a marine environment) the takes of marine mammals (by Level A harassment and harm under the MMPA and ESA, respectively) and facilitate compliance with the MMPA and ESA, as described above.

NMFS will use the same AUD INJ criteria in the identification and quantification of MMPA Level A harassment for both military readiness and non-military readiness activities. Because the acoustic criteria for AUD INJ predict the onset of AUD INJ, they are inclusive of the ''potential'' and ''significant potential'' language in the two definitions of Level A harassment. The limited data now available do not support the parsing out of a meaningful quantitative difference between the ''potential'' and ''significant potential'' for injury and, therefore, the designated AUD INJ criteria will be treated as onset of Level A harassment for both types of activities.

Estimating the numbers of take by Level A harassment and harm is one component of the fuller analyses that inform NMFS' ''negligible impact'' and ''jeopardy'' determinations under the MMPA and ESA, respectively. Last, the AUD INJ criteria may be used to inform the development of mitigation and monitoring measures (such as shut-down zones) pursuant to the MMPA or ESA.

When initiating any of the MMPA or ESA processes described above, agencies and other action proponents should utilize the AUD INJ criteria, in combination with activity-specific information, to predict whether, and if so how many, instances of AUD INJ are expected to occur.

Application of Acoustic Criteria for Temporary Threshold Shift

As previously stated, NMFS has not considered TTS an auditory injury for purposes of the MMPA and ESA, based on the work of a number of investigators that have measured TTS before and after exposure to intense sound. For example, Ward (1997) suggested that a TTS is within the normal bounds of physiological variability and tolerance and does not represent physical injury. In addition, Southall *et al.* (2007, 2019) indicate that although AUD INJ is a tissue injury, TTS is not because the reduced hearing sensitivity following exposure to intense sound results primarily from fatigue, not loss, of cochlear hair cells and supporting structures, and is reversible. TTS is not considered Level A harassment under the MMPA. However, given the associated disruptions of behavioral patterns anticipated to co-occur with TTS in some cases, it has been considered take by Level B harassment under the MMPA and harassment under the ESA, which will be the subject of future guidance.

MMPA Level B harassment and ESA harassment are broad categories that encompass not only TTS but also other behaviorally related impacts that almost always involve a lower onset threshold than that for onset of TTS. In quantifying take by Level B harassment or harassment, NMFS considers *all* effects that fall into those categories of take, not just TTS. NMFS is in the process of developing updated acoustic criteria for the onset of behavioral effects and will further consider the best approach for considering TTS at that time. When that process is completed, NMFS will provide further guidance regarding how to best consider and/or quantify TTS for non-pulse and impulse sources that do not involve instantaneous explosives (see exception below for underwater explosives). In the meantime, except in the case of instantaneous underwater explosives (discussed next), action proponents do not need to quantify estimates of TTS separately from their overall behavioral harassment take calculations. NMFS will consider the TTS acoustic criteria in the 2024 Updated Technical Guidance as part of the larger comprehensive effects analyses under the MMPA and the ESA.

With respect to instantaneous underwater explosives (as distinguished from repeated explosives such as gunnery exercises), NMFS already requires quantification of TTS estimates because instantaneous explosives do not have a separate behavioral component from a lower exposure threshold and there is no time accumulation involved. The rationale for calculating TTS for instantaneous explosives continues to apply with the 2024 Updated Technical Guidance.

The occurrence and estimated number of TTS takes is one component of the larger analysis that informs NMFS's ''negligible impact'' and ''jeopardy'' determinations under the MMPA and ESA, respectively. As with AUD INJ, TTS acoustic criteria also may be used to inform the development of mitigation and monitoring measures pursuant to the MMPA or ESA.

Comments and Responses

On May 3, 2024, NMFS published the draft 2024 Updated Technical Guidance for a 45-day public comment period (89 FR 36762). During the public comment period, NMFS received 7 comments from individual members of the public, Fugro, EnerGeo Alliance and American Petroleum Institute, National Resources Defense Council, and Ocean Conservation Research. Six commenters (*i.e.,* one commenter provided two separate comments) provided substantive comments addressing technical aspects or issues relating to the implementation of criteria.

Some comments were similar to those received during the public comment periods for the 2016 Technical Guidance. For example, these similar comments addressed topics such as why NMFS does not consider TTS as injury, use of mean/medians, pseudoreplication, uncertainty, development of criteria for low-frequency (LF) cetaceans, Tougaard *et al.* 2015, and Wright 2015. NMFS will not repeat our responses from 2016 here but instead refers readers to our previous **Federal Register** notification (81 FR 51694, August 4, 2016) that previously addressed these comment topics.

2024 Updated Technical Guidance Scope

Comment 1: One commenter stated that Sirenians should be included in the 2024 Updated Technical Guidance.

Response: The 2024 Updated Technical Guidance does not pertain to marine mammal species under the U.S. Fish and Wildlife Service's jurisdiction (*e.g.,* walrus, polar bears, manatees, dugongs, sea otters). Thus, Sirenians are not included in the main document. However, they are included in the Navy's Technical Report, attached to the 2024 Updated Technical Guidance as Appendix A.

Peer Review Process

Comment 2: One set of commenters stated that while the main sections of the 2024 Updated Technical Guidance was peer reviewed by experts, the Navy's Technical Report does not seem to be.

Response: The 2024 Updated Technical Guidance document, including the Navy's Technical Report (Appendix A), completed all stages of the review process (*i.e.,* the entire document underwent NMFS internal review, peer review, Federal agency preview, and public comment). Furthermore, during the peer review, federal agency preview, and public comment period, NMFS worked directly with the Navy to address some of the comments received.

Marine Mammal Hearing

Comment 3: To define a marine mammal hearing group's generalized hearing range, one commenter asked whether the 65 dB level above the threshold of maximum hearing sensitivity was chosen arbitrarily (*i.e.,* they asked for a reference that supports choosing a threshold specifically 5 dB wider than that in humans).

Response: NMFS did not choose this level arbitrarily. We specifically chose the 65 dB threshold to be slightly wider than how the hearing range for humans is defined in order to encompass the general uncertainty of marine mammal hearing ranges, since we do not have hearing data for all species.

Comment 4: One commenter's letter stated that sperm whales are categorized as high-frequency (HF) cetaceans but produce lower frequency sounds and are expected to hear lower frequencies compared to smaller delphinids. The commenter pointed out that Southall *et al.* 2019 indicated that sperm whales, killer whales, and beaked whales may be separated from other HF cetaceans in the future (*i.e.,* compose a mid-frequency (MF) cetacean hearing group), but Appendix A (Finneran Technical Report) does not address this potential future hearing group. The comment also notes there is potential variation of phocid hearing that may necessitate splitting this hearing group in the future. In a related comment, another commenter questioned why killer whale hearing data were not used to define audiograms for a separate MF cetacean group.

Response: While the potential to separate some marine mammal species into a separate MF cetacean hearing group is not directly mentioned in Appendix A (Finneran Technical Report), NMFS does address this in our main document. Specifically, table 1, footnote 1, says Southall *et al.* 2019 indicates that as more data become available there may be separate hearing group designations for very low-frequency cetaceans (blue, fin, right, and bowhead whales) and MF cetaceans (sperm, killer, and beaked whales). However, at this point, all baleen whales are part of the low-frequency (LF) cetacean hearing group, and sperm, killer, and beaked whales are part of the HF cetacean hearing group. Additionally, recent data indicate that as more data become available for Monachinae seals, separate hearing group designations may be appropriate for the two phocid subfamilies (Ruscher *et al.* 2021; Sills *et al.* 2021). NMFS concurs with the aforementioned studies that there are currently not enough data to further separate out MF cetaceans from HF cetaceans or further divide the phocid hearing group.

Comment 5: One comment letter questioned why the LF cetacean generalized hearing range expanded by 1 kHz, if there are no new data.

Response: While there are no new data available for LF cetaceans specifically, the weighting function parameters slightly changed for all hearing groups as a result of maintaining consistency with other hearing groups. As a result, NMFS re-examined the generalized hearing range for all hearing groups.

Comment 6: Numerous commenters inquired why auditory evoked potential (AEP) data are not being considered in deriving composite audiograms for various hearing groups and encouraged that all data be considered. Some commenters advocated for further research to focus on better integrating AEP data.

Response: NMFS agrees that incorporating AEP data into composite audiograms would be preferred and would expand the number of species where hearing data are available. Nevertheless, there are some well-defined reasons this is not done. Behavioral techniques measure perception of sound by a receiver, while AEP methods measure only neural activity (Jewett and Williston 1971) (*i.e.,* the two methodologies are not necessarily equivalent). Behavioral techniques, which are considered most representative (*i.e.,* ''gold standard'' for measuring auditory sensitivity, consistently produce lower thresholds, which are indicative of greater sensitivity, than those obtained by AEPs (*e.g.,* Szymanski *et al.* 1999; Yuen *et al.* 2005; Houser and Finneran 2006). AEP data are considered if they are the only data available for a hearing group (*e.g.,* LF cetaceans; See *Response* to next *Comment*). Currently, there are no established means for ''correcting'' AEP data so they are more comparable to behavioral data (Heffner and Heffner 2003; Finneran 2015; Sisneros *et al.* 2016; Erbe *et al.* 2016). NMFS is aware that the Navy's Living Marine Resources

(LMR) Program is supporting a project entitled *Standardizing Auditory Evoked Potential Hearing Thresholds with Behavioral Hearing Thresholds* by Dorian Houser, National Marine Mammal Foundation, which may allow for the addition of AEP data to future versions of our Technical Guidance: *https://exwc.navfac.navy.mil/Portals/88/Documents/EXWC/Environmental_Security/Living%20Marine%20Resources/LMRFactSheet_Project47.pdf.* NMFS also included this topic as a specific data gap in Appendix B to the 2024 Updated Technical Guidance (''Research Recommendations for Improved Criteria'').

Comment 7: Many commenters were interested in learning about recent AEP hearing measurements collected on minke whales by the National Marine Mammal Foundation. One commenter cautioned that the *Balaenoptera* (blue, fin, Rice's, Bryde's, minke, and sei whales) are just one genus of whale that use sounds in ways differently than *Megaptera* (humpback whales), *Eschrichtius* (gray whales), *Balaena* (bowhead whales), or *Eubalaena* (right whales) do. Similarly, another comment stated that NMFS should acknowledge that, given substantial differences among these LF cetacean species in their anatomy, sound production, and acoustic ecology, minke whales may not appropriately represent the hearing sensitivity of blue, fin, humpback, gray, and certain other baleen whales in the LF cetacean group; and that a more conservative approach to weighting in the very low frequencies may still be necessary. The commenter also remarked that NMFS should commit to a re-evaluation of LF cetacean group thresholds as soon as those data are published.

Response: NMFS is aware that the National Marine Mammal Foundation successfully collected preliminary hearing data on two minke whales during their third field season (2023) in Norway. These data have implications for not only the generalized hearing range for LF cetaceans but also on their weighting function. However, at this time, no official results have been published. Furthermore, a fourth field season (2024) was recently completed, where more data were collected. Thus, it is premature for NMFS to propose any changes at this time. However, mysticete hearing data is identified as a special circumstance that could merit re-evaluating the acoustic criteria in the 2024 Updated Technical Guidance, once the data from both field seasons are published.

NMFS anticipates the publication of these AEP data from minke whales will help better inform the composite audiogram and associated weighting function for LF cetaceans. We agree that while having direct measurements of minke whale hearing would represent a significant milestone in better understanding mysticete hearing, these data will need to be considered carefully in the context of how they may or may not be appropriate to fill data gaps for other LF cetacean species.

Comment 8: One commenter asserted that table A.3, which provides composite audiogram parameters, contains a number of errors. One error they purportedly identified is the use of hertz (Hz) instead of kHz (*e.g.,* the F_1 parameter for HF cetaceans is 9910 kHz and for Sirenians is 1680 kHz). Another example is the upper roll-off for the very-high frequency (VHF) cetaceans that begins below 100 kHz in Figure A.4, yet the value for the F_2 parameter (132 kHz) in table A.3 fails to match this result. As a consequence, they assert, they were unable to assess NMFS' use of ΔT values in extrapolating certain parameters across hearing groups.

Response: Table A.3 is correct and does not contain any errors. This can be verified by calculating Eq. (3) (*i.e.,* median threshold equation for composite audiogram) with the parameters from table A.3 and comparing the results to the composite audiograms. The F_1 and F_2 parameters in table A.3 are not roll-off frequencies, but instead are fitting parameters for use with Eq. (3) to best match the composite audiogram data. Because of the large number of fitting parameters, the values may not always make physical sense, especially for audiograms without a plateau region. This point is specifically made in the Finneran Technical Report (Appendix A, including the example cited by the reviewer) that the large number and possible high dependency of fitting parameters, in some cases the specific fitting parameter values may not make physical sense (*e.g.,* HF group F1 = 9910 kHz), and the important point is how well the resulting curve fits the median threshold data.

Comment 9: One commenter advocated that the F_1 audiogram fitting parameter for LF cetaceans be changed from 412 Hz to 137 Hz.

Response: NMFS disagrees that the F_1 audiogram fitting parameter for LF cetaceans should be adjusted, since no new data have become available supporting this change. This parameter is the same as published in Southall *et al.* 2019, as well as what was in the 2018 Revised Technical Guidance, and is appropriate based on our current understanding of LF cetacean hearing. Furthermore, when the new minke whale hearing data become available, it is likely that NMFS will begin the process of updating the acoustic criteria for LF cetaceans based on these data. Thus, the composite audiogram, thresholds, and weighting functions for this hearing group will all be re-examined and appropriate adjustments can be made.

Weighting Functions

Comment 10: A group of commenters requested that Appendix A (Finneran Technical Report) provide a detailed description of the methodology used to derive equations and criteria. On a few occasions, it is noted that mean values are calculated from data sets for deriving the weighting function, but the number of samples used to derive means or medians are not readily available. When available, this should be provided along with standard deviations.

Response: Figures A14 through A17 in Appendix A show the individual TTS onset values and the mean values used to fit the exposure functions. The number of samples and a sense of the variability can be determined from these plots.

Comment 11: Several commenters had questions about the 2024 Updated Technical Guidance modifying the weighting function high-frequency exponent (b) from 2 to 5, which was done to fit better underwater otariid pinniped data. Many asked why this parameter was modified for all hearing groups and not just otariids.

Response: This question was also asked during our Peer Review. In the 2018 Technical Guidance (and Southall *et al.* 2019), the b parameter was the same for all hearing groups. Thus, the changes made to the 2024 Updated Technical Guidance are consistent keeping this parameter the same for all hearing groups. Increasing the b parameter from two to five was done to fit better the underwater otariid (OW) pinniped function without substantially affecting the other marine mammal hearing group fits. The decision to keep the same b parameter for all groups was made to try to reduce complexity where possible, and there are no data to currently suggest this parameter varies by marine mammal hearing group.

Comment 12: A group of commenters asked for clarification on the R^2 value for underwater phocid (PW) pinnipeds (*i.e.,* -4.69) in table A.7 displaying weighting function parameters.

Response: A similar question was also asked during our Peer Review. The negative R^2 indicates the curve-fit does not follow the general trend in the data (*i.e.,* the data would have fit better with

a flat line). This is a result of the assumption that the weighting function should be broader than the audiogram, thus F_1 was decreased after fitting for the PW group to match the audiogram 10-dB bandwidth. This prevents the weighting function from adjusting to best-fit the data points and causes the very low R^2 value.

Temporary Threshold Shifts

Comment 13: A group of commenters stated that NMFS should clarify which TTS data in table 7 were collected using electrophysiological (AEP) methods vs. behavioral methods. They indicate that table 7 is misleading as it lists all the TTS studies available for integration, while only a small portion of these studies was used in the analysis.

Response: NMFS agrees that this is important information to include and has updated table 7 to distinguish between which studies collected hearing measurements via behavioral methodology vs. AEPs.

Comment 14: A group of commenters disagreed that impulsive sounds are more injurious than non-impulsive sounds. Specifically, their comment indicated that there are no direct or consistent data for marine mammals demonstrating that impulsive sounds are more injurious. They also indicated that marine mammals are able to self-mitigate, which might protect them from noise exposure.

Response: While there are limited marine mammal TTS data associated with exposure to impulsive sound, there is a rich library of literature available for terrestrial mammals that indicates exposure to impulsive sounds more often leads to mechanical damage of the inner ear, as well as more complex patterns of hearing recovery (*e.g.,* Henderson and Hamernik 1986; Hamernik and Hsueh 1991). Additionally, inner ear anatomy is conserved among all mammals, including marine marine mammals (Grunstra *et al.* 2024). Thus, lessons learned from terrestrial mammals likely translate to marine mammals. Furthermore, the marine mammal TTS data currently available do support that TTS and AUD INJ onset thresholds are lower for impulsive sounds compared to non-impulsive sounds.

Appendix B (Research Recommendations for Improved Criteria) in the 2024 Updated Technical Guidance acknowledges that odontocetes may have multiple means of reducing or ameliorating the effects of noise exposure. However, at this point, directly incorporating these mechanisms into our AUD INJ and TTS criteria and anticipating the likelihood of exposure ahead of an activity is difficult. More information on these mechanisms, especially associated with real-world exposure scenarios, would be useful.

Comment 15: One commenter remarked that Southall *et al.* 2019 found an approximately +/−6 dB difference in measured versus predicted TTS onset data. The commenter advocated there should be a similar measure of accuracy in Appendix A (Finneran Technical Report), but that the document provides no measure of natural variability or uncertainty, or any indication of predictability. Thus, they recommend that the agency implement a 6-dB reduction to its TTS and AUD INJ thresholds in line with the suggestions by Tougaard *et al.* 2015.

Response: There are numerous figures showing TTS onset data and the relationship between the exposure functions and the TTS data. These graphs indicate the variability in the TTS data and the differences between the measurements of TTS onset and the predicted exposure functions. Furthermore, NMFS disagrees that a 6-dB reduction is necessary or justifiable (and despite Southall *et al.* 2019 indicating variability in TTS data for VHF cetaceans, they did not alter their proposed TTS thresholds).

Comment 16: A group of commenters noted that there are significant changes for HF cetaceans criteria compared to the 2018 Technical Guidance, based on data from Finneran *et al.* 2023, and indicated that these changes were not highlighted in the draft 2024 Updated Technical Guidance. The comment expressed concern that since numerous HF species travel in large groups, there is a potential that take will be overestimated, as the 2024 Updated Technical Guidance does not account for behavioral responses of the animals. They also noted that in Figure A.14 for 2 kHz, it seems like the mean used for fitting value is much lower than the actual mean of the TTS onset values obtained by three studies (filled icons).

Response: This change was highlighted in Section 1.3 of the draft 2024 Updated Technical Guidance (Changes Associated with 2024 Updated Technical Guidance), specifically the fifth bullet: *Lower TTS and AUD INJ thresholds* ([cumulative sound exposure level metric] SEL_{24h} *metric) for HF cetaceans, below 10 kHz, based on new data (Finneran et al. 2023a).* Furthermore, the behavioral response of marine mammals to anthropogenic sounds is outside the scope of the 2024 Updated Technical Guidance. Finally, there are two TTS onset data points at 2 kHz (brown triangles in Figure A.14). The mean value (large circle in Figure A.14, visually between the two data points) was used during curve-fitting.

Comment 17: A group of commenters noted Appendix A (Navy's Technical Report) indicates ''For VHF, new data suggest substantially higher onset TTS SELs at frequencies above ~10 kHz compared to the Phase 3 predictions, with high variability in the TTS onset data for harbor porpoises at 63 kHz (~40 dB difference in TTS onset for the two porpoises). Furthermore, the harbor porpoise behavioral TTS onset SELs are significantly higher than SELs resulting in large amounts (*e.g.,* 23–45 dB) of AEP TTS in Yangtze finless porpoise (see Fig. A.8). Although some differences in AEP/behavioral TTS data are expected, these large differences indicate that caution is warranted in adopting the high-frequency behavioral TTS data at the present time. For this reason, the VHF behavioral TTS onset data at frequencies >10 kHz were not used during the exposure function fitting process.'' They commented this is problematic as it deviates from the other species group and processes used throughout the document as behavioral methodology is preferred.

Response: Numeric TTS onsets for the VHF cetaceans were derived using only behavioral data. For conditions where both behavioral and AEP data were available, the behavioral TTS data were used, because the relationship between AEP and behavioral TTS onsets is not clear. However, the AEP data cannot be completely ignored, and large differences between AEP and behavioral TTS onsets raise concerns. Because of the large difference in VHF cetacean behavioral TTS onset across individuals from the same study, and large differences between some of the behavioral and AEP data, the highest frequency VHF cetacean data were not used during the fitting process; only the lower frequency behavioral TTS data were used. This is consistent with the approach taken with other species groups, such as PW pinnipeds.

Comment 18: A commenter noted the 2024 Updated Technical Guidance generates notably higher TTS onset weighted exposure levels for harbor porpoise than the species-specific Tougaard *et al.* 2022 publication, even when accounting for different weightings.

Response: Tougaard *et al.* 2022 advocates examining harbor porpoise TTS data available since 2015 and calls for revisiting the synthesis culminating in Southall *et al.* 2019. NMFS' 2024 Updated Technical Guidance synthesizes all the same studies mentioned in Tougaard *et al.* 2022 (table

IV from that publication), including those since Southall *et al.* 2019.

For impulsive sounds, compared to Southall *et al.* 2019 (which Tougaard *et al.* 2022 supports), the TTS SEL_{24h} thresholds in the 2024 Updated Technical Guidance are 4 dB higher. For non-impulsive sounds, compared to Southall *et al.* 2019 (which Tougaard *et al.* 2022 indicates updated data below 10 kHz correspond well, with more differences above 10 kHz), the TTS SEL_{24h} thresholds in the 2024 Updated Technical Guidance are 8 dB higher. However, it should be noted that the weighting function for VHF cetaceans has also shifted, making them more susceptible to noise-induced hearing loss below 10 kHz, where the majority of anthropogenic sound sources have their energy. Thus, both the thresholds and the weighting factors need to be considered in concert when evaluating the acoustic criteria for any marine mammal hearing group.

Comment 19: A group of commenters noted that Appendix A (Finneran Technical Report) indicates that harbor seal TTS onset data below 2.5 kHz were excluded from the Phase 4 fitting process and asked how this data exclusion would affect potential applicants more concerned about Moanachinae vs Phocinae pinnipeds.

Response: All phocids exposed in water are within the PW pinniped group and use the same criteria, therefore the exclusion affects Monachinae and Phocinae in the same way.

Comment 20: A commenter questioned NMFS' inclusion of a 132 dB data point in calculating the mean difference between TTS onset and the auditory threshold at f_0. The commenter states that if 132 dB is not an outlier among the other cited values (116 dB, 116 dB, and 118 dB), then they do not know what would count as one. More generally, the commenter states that a visual review of Figures A.14 to A.17 indicates the presence of multiple apparent outliers, which collectively are likely to influence the fit of the exposure function.

Response: In combining values or deriving central tendencies, the default approach was to use the mean. Identifying true outliers in the various datasets was difficult because the sample sizes were typically small, and in many cases, the underlying distributions were unknown. Even if individual species group distributions were Gaussian, it is probable that sampling from the different groups would result in a unique, non-Gaussian distribution, and thus a Gaussian distribution for purposes of statistically testing for outliers could not be assumed. Datasets were therefore considered on a case-by-case basis, taking into account not only the range of numeric values, but the specific circumstances under which the data were obtained. There were only four instances where changing from the mean to the median was warranted:

(1) Estimating hearing thresholds for each group to create the composite audiograms. Here, the number of samples was relatively large, and there could be large fluctuations in thresholds across studies at any given frequency. Using the median value was the simplest way to estimate the composite audiogram, while reducing the influence of any outliers;

(2) Calculating the parameter DT_1. DT_1 and DT_2 (*i.e.,* the amounts that the composite audiogram exceeded the minimum hearing threshold at the weighting function frequency parameters f_1 and f_2, respectively). Values of DT_1 and DT_2 were calculated for HF cetaceans, VHF cetaceans, OW pinnipeds, and PW pinnipeds. For the other species groups, the mean or median of these values was used to estimate f_1 and f_2 from their composite audiogram. DT_1 values for groups HF cetaceans, VHF cetaceans, OW pinnipeds, and PW pinnipeds were 36.8, 11.5, 3.9, 6.5 dB, with mean = 14.7 and median = 9. The difference between 36.8 and its nearest neighbor was 25.3, which was almost 10x larger than the smallest value. For this reason, the median was used rather than the mean. In contrast, for DT_2, values were 38.6, 22.7, 38.9, 39.4, with mean = 34.9 and median = 38.8. Here the mean was used rather than the median, despite a difference of 15.9 between 22.7 and its nearest neighbor;

(3) Cumulative weighted impulse SEL-based TTS onset values for HF cetaceans. There were impulsive TTS onset data from four individuals in the HF cetacean group: 177, 178, 175, 188 dB SEL (mean = 180, median = 178). The associated differences between steady-state and impulsive TTS onsets (C_s-C_i) were 4, 3, 6, and −7 dB (mean = 1.5, median = 3.5). Here, the median was used over concerns that the dolphin subject with the 188 dB onset may not be representative, based on his higher TTS onset and inverted relationship between steady-state and impulsive TTS onset compared to the other HF cetacean individuals. The inverted relationship between the steady-state and impulsive TTS onset values meant that including this subject would have made the impulsive TTS onsets more similar to steady-state onsets, which does not match our current understanding of TTS (impulsive noise is typically more hazardous); and

(4) Estimating the audiogram function parameter B for mysticetes. To estimate B for LF cetaceans, the median of the B values from the composite audiograms for the other in-water species groups was used. The individual values were: 1.66, 24.5, 2.5, 0.786, and 1.79 (mean = 6.25, median = 1.79). The range of values here is extreme, with the largest value >31x the smallest and almost 10x larger than its nearest neighbor. For this reason, the median was used.

In terms of the specific comments, the differences between hearing threshold and TTS onset at f_0 (the frequency of best sensitivity) were 132, 118, 116, and 118 dB for HF cetaceans, VHF cetaceans, OW pinnipeds, and PW pinnipeds (mean = 121, median = 118). The range of values and differences between neighbors is more similar to those for DT_2, where the mean was used, compared to DT_1, where the median was used. For this reason, the mean was used. Figures A.14 through A.17 show all available TTS data, regardless of the amount of TTS. These graphs therefore cannot be used to assess whether a data point is an ''outlier'' or not.

Comment 21: With the inclusion of in-air pinniped acoustic criteria in the 2024 Updated Technical Guidance, a group of commenters asked how NMFS plans on managing pinnipeds entering and leaving the water (*e.g.,* Does NMFS anticipate having animals 100 percent in air and/or 100 percent underwater during exposure calculations?).

Response: The inclusion of the in-air pinniped criteria in our 2024 Updated Technical Guidance was to promote consistency with other documents that previously have included in-air criteria, such as Southall *et al.* 2007 and Southall *et al.* 2019. Their inclusion does not necessitate anything changing in terms of how previous analyses have been completed for pinnipeds.

Recovery and Effective Quiet

Comment 22: A group of commenters requested that recovery should be considered within the 2024 Updated Technical Guidance. They recommended that NMFS consider reviewing terrestrial data and comparing it to the cited two references (Finneran *et al.* 2010a and Finneran and Schlundt 2013) that presented a model to approximate recovery in bottlenose dolphins. They stated that expansion to other odontocetes seems very reasonable and more supportable compared to some of the other decisions made in the 2024 Updated Technical Guidance.

Response: NMFS acknowledges that after sound exposure ceases or between successive sound exposures, the potential for recovery from hearing loss exists, with AUD INJ resulting in incomplete recovery and TTS resulting in complete recovery. Nevertheless, predicting recovery from sound exposure can be complicated. Currently, recovery in wild marine mammals cannot be accurately quantified. As mentioned in the Comment, Finneran *et al.* 2010a and Finneran and Schlundt 2013 proposed a model that approximates recovery in bottlenose dolphins exposed to tones. However, the applicability of this model to other species, other sound sources, and other exposure conditions has yet to be determined. As more data become available for a broader array of species and sound sources, the incorporation of recovery can be considered for future iterations of the Technical Guidance.

Comment 23: A group of commenters indicated that it was unclear why effective quiet (*i.e.,* the maximum sound pressure level that will fail to produce any significant threshold shift in hearing despite duration of exposure and amount of accumulation) was not integrated in the 2024 Updated Technical Guidance.

Response: While NMFS agrees that effective quiet is an important consideration, there are limited data available to define effective quiet for marine mammals. As more data become available (identified as a data gap in Appendix B, Research Recommendations for Improved Criteria), they will be useful for a better understanding of appropriate accumulation periods for the weighted SEL_{24h} metric and noise-induced hearing loss, as well as whether there is potential for low-level (*e.g.,* Copping *et al.* 2014; Schuster *et al.* 2015; Copping and Hemery 2020; Tougaard *et al.* 2020; Stöber and Thomsen 2021; Kulkarni and Edwards 2022), continuously operating sources (*e.g.,* alternative energy tidal, wave, or wind turbines) to result in noise-induced hearing loss or not (*i.e.,* below effective quiet).

Auditory Injury

Comment 24: One commenter recommended that NMFS move away from establishing AUD INJ/TTS criteria and instead consider an ''Auditory Damage Index,'' which could include considerations of long-term hearing degeneration because of acute or chronic noise exposure and better allow for the assessment of a continuum of effects.

Response: NMFS agrees that noise-induced hearing loss follows a continuum (Houser 2021). However, to best quantify this continuum in a regulatory context, NMFS has established an onset criteria for both TTS and AUD INJ.

Comment 25: A commenter noted that the definition of AUD INJ includes but is not limited to PTS. They commented that AUD INJ threshold levels in many cases are higher than previous PTS levels in the 2018 Technical Guidance and asked if it is possible to determine levels that will result in the ''*loss of cochlear neuron synapses or auditory neuropathy,*'' and if NMFS is expanding the range of auditory damage to be considered, whether threshold levels in all cases should be reduced.

Another commenter had a similar comment, where they were concerned that this criterion is not conservative for purposes of representing directly-induced AUD INJ. They indicated that 40 dB TTS cannot continue to represent AUD INJ once indirect or accumulated injury is added. Conceptually, if directly-induced PTS alone equates to 40 dB TTS, then the two processes together must equate to less than 40 dB TTS. Thus, levels of noise exposure that can result in auditory neuropathy are capable of inducing PTS or AUD INJ.

Response: NMFS disagrees that based on our inclusion of AUD INJ, our thresholds should be adjusted or reduced. As stated in the 2024 Updated Technical Guidance, in situations where destruction of auditory tissue has occurred in terrestrial mammals, threshold shifts were 30 to 50 dB measured 24 hours after the exposure. There is no evidence that an exposure resulting in <40 dB TTS measured a few minutes after exposure can produce AUD INJ. Therefore, an exposure producing 40 dB of TTS measured a few minutes after exposure is used as an upper limit of a threshold shift to prevent AUD INJ (*i.e.,* it is assumed that only exposures beyond those capable of causing 40 dB of TTS have the potential to result in AUD INJ, which may or may not result in PTS).

Comment 26: A group of commenters requested clarification regarding use of the phrase a ''*few minutes*'' in Appendix A (Finneran Technical Report) where it talks about 40 dB of TTS, measured a few minutes after exposure, being used as a conservative estimate for the onset of PTS. The commenters indicated that this phrase was vague and should be clarified.

Response: In this context, a ''few minutes'' means the range of time over which marine mammal TTS initial post-exposure thresholds are obtained, typically 2 to 4 minutes.

Metrics

Comment 27: One commenter noted that 2024 Updated Technical Guidance indicates that SEL_{24h} metric is not intended to estimate impact of noise exposure ''*over various spatial and temporal scales.*'' The comment asked if this means the SEL_{24h} metric is not intended for accumulating exposures that occur at considerably different locations and times; and the reason for such a limitation if that is the case. The commenter asked if auditory recovery plays a role in the explanation.

Response: As the 2024 Updated Technical Guidance indicates, current data available for deriving criteria using the SEL_{24h} metric are based on exposure to only a single source and therefore may not be appropriate for situations where exposure to multiple sources is occurring. As more data become available, the use of this metric can be re-evaluated for application of exposure from multiple activities occurring in space and time.

While auditory recovery is an important consideration, predicting recovery from sound exposure can be complicated. Currently, recovery in wild marine mammals cannot be accurately quantified. For the 2024 Updated Technical Guidance criteria, for intermittent, repeated exposures within a 24-hour period, NMFS assumes there is no recovery between subsequent exposures, although auditory recovery has been demonstrated in terrestrial mammals (Clark *et al.* 1987; Ward 1991) and more recently in a marine mammal studies (Finneran *et al.* 2010b; Kastelein *et al.* 2014a; Kastelein *et al.* 2015b). As more data become available, this topic can be further evaluated and potentially considered in future versions of this guidance.

Comment 28: A commenter recommended the incorporation and use of the kurtosis metric in the 2024 Updated Technical Guidance.

Response: NMFS agrees that kurtosis (*i.e.,* a statistical quantity that represents the impulsiveness or ''peakedness'' of the event), can be a useful consideration for distinguishing between impulsive and non-impulsive sounds. However, there are questions of how to apply this metric to marine mammal acoustic criteria (Von Benda-Beckmann *et al.* 2022). NMFS has identified kurtosis as a topic for further research in the 2024 Updated Technical Guidance (Appendix B: Research Recommendations for Improved Criteria). While kurtosis may be useful in helping determine when impulsive vs. non-impulsive criteria might be applicable for a particular sound source in a specific situation, it

does not necessitate any changes to the criteria in the 2024 Updated Technical Guidance (*i.e.,* kurtosis affects implementation of the acoustic criteria, not the criteria themselves).

Comment 29: A group of commenters noted that for VHF cetaceans, there is one study (Kastelein *et al.* 2017c) where a higher peak sound pressure level (PK SPL) (199 dB) did not trigger TTS (maximum threshold shift of 3 to 5 dB), but Lucke *et al.* 2009 obtained significant TTS with a lower level PK SPL (195 dB) using AEP measurements. The commenters state these contradicting results highlight that PK SPL is currently not a robust and good predictor of TTS, and suggest that NMFS provide stronger reasoning on the choice of Lucke *et al.* 2009, while Kastelein *et al.* 2017c used behavioral methods (preferred method in Acoustic Guidance and Appendix A, Navy's Technical Report).

Response: NMFS acknowledges there are limited marine mammal data available for impulsive sounds reporting the PK SPL metric. However, we disagree that PK SPL is not a good predictor of TTS and believe it has inherent value in establishing marine mammal AUD INJ and TTS criteria. As stated in the 2024 Updated Technical Guidance, sound exposure containing transient components (*e.g.,* short duration and high amplitude; impulsive sounds) can create a greater risk of causing direct mechanical fatigue to the inner ear (as opposed to strictly metabolic) compared to sounds that are strictly non-impulsive (Henderson and Hamernik 1986; Levine *et al.* 1998; Henderson *et al.* 2008). Often the risk of damage from these transient components does not depend on the duration of exposure. Thus, weighted SEL_{24h} is not an appropriate metric to capture all the effects of impulsive sounds, which is why instantaneous PK SPL has also been chosen as part of NMFS's dual metric criteria for impulsive sounds. Of note, human noise standards recognize and provide separate criteria for impulsive sound sources using the PK SPL metric (Occupational Safety and Health Administration 29 CFR 1910.95; Starck *et al.* 2003).

As indicated in the document (Appendix A, Navy's Technical Report), PK SPL thresholds for TTS were based on TTS data from single impulsive sound exposures that produced 6 dB or more TTS for the HF and VHF cetaceans (the only groups for which data are available). The PK SPL thresholds from these data were 224 and 196 dB, for HF and VHF cetaceans, respectively (table A.5, Finneran *et al.* 2002; Lucke *et al.* 2009). The choice of relying on Lucke *et al.* 2009, even though it relies on AEP data, is due to the limited nature of the impulse TTS data for marine mammals and the likelihood that the VHF cetaceans are more susceptible than the HF cetaceans (*i.e.,* use of the HF cetacean value is not appropriate). Based on the limited data, it is reasonable to assume that the exposures described by Lucke *et al.* 2009, which produced AEP-measured TTS of up to 20 dB, would have resulted in a behavioral TTS of at least 6 dB. Finally, Kastelein *et al.* 2017c is not used because it did not meet our definition of TTS as requiring a threshold shift of at least 6 dB.

Future Updates to Technical Guidance

Comment 30: A group of commenters stated it is unclear how/when NMFS will decide the appropriate timeline to next update the Technical Guidance. They also questioned how NMFS will integrate future data in future iterations and whether an update would require another Navy Technical Report or Southall *et al.* publication.

Response: The 2024 Updated Technical Guidance provides a procedure and timeline for future updates in Section 3.1., where it indicates that NMFS will continue to monitor and evaluate new data as they become available and periodically convene staff from our various offices, regions, and science centers to revise the Updated Technical Guidance as appropriate (anticipating updates to occur on a three to five year cycle). A new Navy Technical Report and/or Southall *et al.* publication would be considered if either becomes available.

Finally, as mentioned in an earlier response, NMFS is aware that the National Marine Mammal Foundation successfully collected preliminary hearing data on 2 minke whales during their third field season (2023) in Norway. However, at this time, no official results have been published. Furthermore, a fourth field season (2024) was recently completed, where more data were collected. Thus, it is premature for NMFS to propose any changes at this time. However, mysticete hearing data is identified as a special circumstance that could merit re-evaluating the acoustic criteria in the 2024 Updated Technical Guidance, once the data from both field seasons are published.

Miscellaneous Issues

Comment 31: A group of commenters stated that the absence of consideration of ambient noise in measurements targeted at measuring a single source can be problematic, as certain environments have already elevated ambient noise levels even without the introduction of any specific source or activity. NMFS listed ''Multiple sources'' as a research priority in Appendix B (Research Recommendations for Improved Criteria), and while the commenters agree that information on multiple sources might be important to better characterize how the acoustic environment of animals might change, it is also critical to recognize the importance of ambient noise, particularly if NMFS recommends applicants consider recording broadband measurements.

Response: NMFS agrees that characterizing the existing soundscape is an important consideration and has added it to the Appendix B (Research Recommendations for Improved Criteria) as suggested.

Comment 32: Several commenters inquired about the status of NMFS updating behavioral disturbance criteria for marine mammals.

Response: Behavioral disturbance criteria are outside the scope of the 2024 Updated Technical guidance. However, NMFS is currently in the process of developing draft marine mammal behavioral disturbance criteria. To date, we have completed a NMFS internal review and have started the peer review via the Center for Independent Experts (July 2024). For more information on how this review is progressing, please see: *https://www.noaa.gov/information-technology/national-marine-fisheries-services-development-of-recommended-behavioral-disturbance-criteria-for.*

Dated: October 21, 2024.

Kimberly Damon-Randall,

Director, Office of Protected Resources, National Marine Fisheries Service.

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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; High Seas Fishing Permit Application, Logbook Reporting, and Vessel Marking

AGENCY: National Oceanic & Atmospheric Administration (NOAA), Commerce.