Request for 2012-2014 Renewal Of The Letter of Authorization Under the Marine Mammal Protection Act for Incidental Harassment Of Marine Mammals Resulting From U.S. Navy Training and Research Activities In The Hawaii Range Complex

Submitted To
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FINAL

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ACRONYMS AND ABBREVIATIONS

ASW	Anti-Submarine Warfare
DoN	Department of the Navy
EAR	Ecological Acoustic Recorder
ESA	Endangered Species Act
EOD	Explosive Ordnance Disposal
HERO	Hazards of Electromagnetic Radiation to Ordnance
HRC	Hawaii Range Complex
LOA	Letter of Authorization
MDSU	Mobile Diving and Salvage Unit
MFAS	Mid-frequency Active Sonar
MMO	Marine Mammal Observer
MMPA	Marine Mammal Protection Act
MTE	Major Training Exercise
NMFS	National Marine Fisheries Service
PAM	Passive Acoustic Monitoring
PMRF	Pacific Missile Range Facility
RFD	Remote Firing Device
SOCAL	Southern California Range Complex
SCC	Submarine Commanders Course
TDFD	Time-Delay Firing Device
ULT	Unit Level Training

1. INTRODUCTION AND DESCRIPTION OF ACTIVITIES

Pursuant to the Marine Mammal Protection Act of 1972 (MMPA), this document is the renewal Application to the National Marine Fisheries Service (NMFS) for a Letter of Authorization (LOA)[1] for incidental harassment of marine mammals from U.S. Navy (Navy) training and authorized activities in the Hawaii Range Complex (HRC).

This application for a Letter of Authorization requests a 2-year period from January 2012 to January 2014 for the taking of marine mammals incidental to training and research within the Hawaii Range Complex under the Marine Mammal Protection Act and in accordance with NMFS Final Rule (NMFS 2009).

Table 1 shows the Marine Mammal Protection Act permit documentation applicable to the Hawaii Range Complex and NMFS's authorization. Information contained in these references provide a complete description of the background for the Navy's request, overview of the Hawaii Range Complex, and description of the specified activities, description of marine mammals in the area, discussion of potential effects or lack of effects of specified activities on marine mammal, mitigation, marine mammal monitoring, and associated reporting. The descriptions contained in these references have not changed, except as noted in this 2012-2014 renewal application package.

The LOA will not address activities designated for armed conflict or direct combat support operations, nor during periods of heightened national threat conditions, as determined by the President and Secretary of Defense or their duly designated alternatives or successors, as assisted by the Chairman of the Joint Chiefs of Staff.

Monitoring and Exercise reports required by 50 C.F.R. §216.175(c) through (j) were submitted on 1 October 2011.

[1] under Section 101 (a)(5)(A) of the MMPA

Table 1. Timeline of key Hawaii Range Complex MMPA documents

Timeline Date	From	Event	Reference
25 Jun 07	Navy	Request for Letter Of Authorization (request for Incidental Harassment For Hawaii Range Complex) submitted to NMFS Office of Protected Resources	DoN 2007
25 Feb 08	Navy	Letter of Authorization Application Update submitted to NMFS Office of Protected Resources	DoN 2008a
02 May 08	Navy	Letter of Authorization Update #2 submitted electronically to NMFS Office of Protected Resources	DoN 2008b
09 May 08	Navy	Hawaii Range Complex Environmental Impact Statement\Overseas Environmental Impact Statement- Final May 2008 published	DoN 2008c
23 Jun 08	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In Hawaii Range Complex; Proposed Rule published in Federal Register (73 FR 35510)	NMFS 2008
31 Dec 08	Navy	2009 Hawaii Range Complex Monitoring Plan-Final December 2008.	DoN 2008d
08 Jan 09	NMFS	Letter of Authorization take marine mammals incidental to Navy exercises conducted in Hawaii Range Complex issued	NMFS 2009a
12 Jan 09	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In Hawaii Range Complex; Final Rule published in Federal Register (74 FR 1456)	NMFS 2009b
01 Oct 09	Navy	Annual Range Complex Exercise Report January to 01 August 2009 For The U.S. Navy's Hawaii Range Complex And Southern California Range Complex.	DoN 2009a
01 Oct 09	Navy	Marine Mammal Monitoring For The U.S. Navy's Hawaii Range Complex (HRC) And Southern California (SOCAL) Range Complex-Annual Report 2009.	DoN 2009b
01 Oct 09	Navy	2010 Hawaii Range Complex Monitoring Plan (included in Annual HRC/SOCAL Monitoring Report)	DoN 2009b
01 Oct 09	Navy	Request for 2010 Letter of Authorization Under the MMPA for Incidental Harassment Of Marine Mammals Resulting From U.S. Navy Training and Research Activities In The Hawaii Range Complex	DoN 2009c
14 Jan 10	NMFS	Letter of Authorization take marine mammals incidental to Navy exercises conducted in Hawaii Range Complex issued	NMFS 2010a
30 Aug 11	Navy	Request for 2011 Letter of Authorization Under the MMPA for Incidental Harassment Of Marine Mammals Resulting From U.S. Navy Training and Research Activities In The Hawaii Range Complex	DoN 2011
07 Feb 11	NMFS	Letter of Authorization take marine mammals incidental to Navy exercises conducted in Hawaii Range Complex issued	NMFS 2011a
08 Feb 11	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In Hawaii Range Complex; U.S. Navy Training in the Southern California Range Complex; and U.S. Navy's Atlantic Fleet Active Sonar Training Interim Final Rule published in Federal Register (76 FR 6699)	NMFS 2011b

The following changes to the original authorization are requested for each year through the remainder of the 5-year MMPA authorization. All other training activities in the original authorization and not discussed below remain the same as described at 50 C.F.R. §216 and NMFS' 7 February 2011 LOA.

Changes from Previous: Mine Neutralization

Due to 2011 mine neutralization training event resulting in the death of three long-beaked common dolphins at the Navy's Silver Strand Training Complex, an evaluation of current mitigation measures has been conducted for mine neutralization events occurring within the Hawaii Range Complex. This Request for Letter of Authorization provides additional details on how mine neutralization is conducted in the HRC, a description of current mitigation measures, and Navy's proposed revisions to mitigations reducing the risk to marine mammals.

The Navy proposes to conduct mine neutralization activities using time-delay firing devices (TDFDs). The number of mine neutralization events (68 events) would remain unchanged from the 2011 Request for Letter of Authorization (DoN 2011).

Overall Operational Mission and Types of Detonation Initiating Devices

Explosive Ordnance Disposal (EOD) personnel require realistic training before conducting high risk, real-world operations. Such real-world operations include those similar to recent world events requiring movement of assets from sea to land and back to sea. These real-world operations involve non-permissive environments (i.e., mine fields, enemy ships, aircraft, etc.) require sailors to carry out their mission undetected and with reduced risk. Proficiency in EOD training generally, and use of time-delay firing devices (TDFDs) specifically, is critical for ensuring the mission of a real-world operation is accomplished safely and Sailors return unharmed. Substitutes to using TDFDs are contradictory to realistic training and are inadequate at satisfying military readiness requirements.

EOD personnel detect, identify, evaluate, neutralize, raise, tow, beach, and exploit mines. Neutralizing an influence mine (e.g., a mine triggered by a magnetic, pressure, or acoustic signature) is an essential part of the EOD Mine Countermeasures (MCM) mission. Neutralization ensures the safety of the men and women of EOD in the recovery and exploitation phase of an influence mine. The EOD mission is typically to locate, neutralize, recover, and exploit mines after they are initially located by another source, such as a MCM or Mine Hunting Class (MHC) ship or an MH-53 or MH-60 helicopter. Once the mine shapes are located, EOD divers are deployed to further evaluate and "neutralize" the mine.

The Navy uses both timed-delayed and positive control to initiate a particular underwater detonation depending on the training event objectives in question and in particular, the training objectives applicable to that underwater detonation. The time-delay firing is called the Timed Delay Firing Device (TDFD). The most common positive control firing is called a Remote Firing Device (RFD). TDFDs are the simplest, safest, most operationally sound method of initiating a demolition charge on a floating mine or mine at depth. TDFDs are used because of their light weight ease of employment and low magnetic signature in cases of mines sensitive to magnetic fields. In addition, TDFD are HERO[1] safe meaning there is reduced risk of accidental detonations from nearby radios or other electromagnetic radiation producing devices. The use

[1] Hazards of Electromagnetic Radiation to Ordnance (HERO) - High intensity radio frequency fields produced by modern radio and radar transmitting equipment can cause sensitive electroexplosive devices contained in ordnance systems and detonators to detonate prematurely. HERO safe items are resistant to this interference.

of TDFD eliminates the need to re‑deploy swimmers from a helicopter or boat to recover equipment used with positive control firing devices such as the RFD. The TDFD also allows sufficient time for EOD personnel to swim outside of the detonation plume radius and human safety buffer zone after the timer is set. For a surface mine neutralization training event involving a helicopter or a boat, the minimum time-delay that is reasonable for EOD divers to make their way outside of the detonation human safety buffer zone is approximately 10 minutes. For a mine neutralization training event at depth using small boats, the time-delay can be minimized to five minutes however this would require the instructors to handle initiation of the detonation and therefore would result in decreased training value for students.

A RFD, a type of positive control device, can be used to initiate an underwater detonation, but it is not normally preferred as the primary firing device due to HERO concerns with electric detonators, Operational Risk Management (i.e., safety) considerations, and established Navy tactical procedures. Current Navy RFD uses a radio signal to remotely detonate a charge. By using electronic positive control devices such as the RFD as the only alternative to a TDFD, additional electronic signals, and metal from the receiver and wiring is unnecessarily introduced into an influence ordnance operating environment. It is not sound safety principles or good demolition practice to combine different firing circuits to a demolition charge. For instance, in a live mine field, Navy dive platoons expect there to be additional risks, such as unknown mines with different types of influence firing circuits (i.e., detonated by contact, magnetic field, or certain sounds) in close proximity to a mine they are trying to destroy. The use of a TDFD reduces these risks by limiting the possibility of an unintentionally triggering detonation from unknown mine types. Underwater demolition needs to be kept as simple and streamlined as possible, especially when divers and influence ordnance are considered. In an open ocean environment, universal use of RFDs would greatly increase the risk of misfire due to component failure, and put unnecessary stress on all needed connections and devices (adding 600 – 1,000 feet of firing wire; building\deploying an improvised, bulky, floating system for the RFD receiver; adding another 180 feet of detonating cord plus 10 feet of additional material).

RFDs, therefore, are not considered a practicable alternative for all underwater detonations. While positive control devices do allow for instantaneous detonation of a charge exclusive use of RFD introduce operationally unsound tactics, thereby increasing future risks to Navy dive teams. It is essential that EOD platoons qualify annually with necessary time-delay certification, maintain proficiency, and train to face real-world scenarios that require use of TDFDs.

Description of Training- Underwater Detonations

The basic discussions of some underwater detonation procedures below typically apply to all underwater detonation training events within the HRC.

Basic Training Description:

Basic training involves neutralizing either a simulated mine on the surface or at depth. The ratio between surface detonations and bottom detonations (at depth) for EOD is about 50/50. This is dependent mainly on range availability and weather conditions. During neutralization of a surface mine, EOD divers are deployed and retrieved via helicopter. However, when helicopter assets are unavailable, a small boat is used as is done with neutralization of a mine at depth. During training exercises, regardless of whether a helicopter or small boat is used, a minimum of two small boats participate in the exercise.

For a surface mine neutralization training event involving a helicopter or a boat, the minimum reasonably safe time-delay for EOD divers to make their way outside of the detonation plume radius/human safety buffer zone (typically 1000 ft (334 yd)) is 10 min. For mine neutralization training events at depth using small boats, the time-delay can be minimized to 5 min. However,

this would require the instructors to handle initiation of the detonation and therefore would result in decreased training value for students.

The range area and associated support equipment are required for a 6 - 8 hour window. Training exercises are conducted during daylight hours for safety reasons.

General Underwater Detonation Procedures

- Prior to getting underway, all Explosive Ordnance Disposal (EOD) units and Mobile Diving and Salvage Units (MDSU) conduct a detailed safety and procedure briefing to familiarize everyone with the goals, objectives, and safety requirements (including mitigation zones) applicable to the particular training event.
- Underwater detonations only occur during daylight hours.
- Underwater detonations are only conducted in sea-states equal to or less than Beaufort 3 (presence of large wavelets, crests beginning to break, presence of glassy foam, and/or perhaps scattered whitecaps).
- EOD or MDSU personnel can be transported to the planned detonation site via small boat or helicopter depending on the training event. Small boats can include 7-m Rigid Hull Inflatable Boats (RHIB), zodiacs, or other similar craft as available to the particular unit.
- Once on site, the applicable mitigation zone is established and visual survey commences for 30 minutes. Divers enter the water to conduct the training objective which could include searching for a training object such as a simulated mine or mine-like shape.
- For the detonation part of the training, the explosive charge and associate charge initiating device are taken to the detonation point. The explosives Navy EOD and MDSU use are military forms of C-4. In order to detonate C-4, a fusing and initiating device is required.
- Following a particular underwater detonation, additional personnel in the support boats (or helicopter) keep watch within the mitigation zone for 30 minutes.
- Concurrent with the post-detonation survey, divers return to the detonation site to confirm the explosives detonated correctly and retrieve any residual material.

2. DURATION AND LOCATION OF ACTIVITIES

There are no changes to Chapter 2 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

3. MARINE MAMMAL SPECIES AND NUMBERS

There are no changes to Chapter 3 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

4. AFFECTED SPECIES STATUS AND DISTRIBUTION

Chapter 4 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011 is updated based upon recent marine mammal publications. These publications do not add new species or densities.

- The insular stock of false killer whales was proposed for listing under the Endangered Species Act (NMFS 2010b). NMFS also proposed to implement the false killer whale take reduction plan addressing fishing activities (NMFS 2011c).
- New information on the movements and spatial use of several species of odontocetes obtained from satellite tags was published in the last year (Baird et al 2011a, Baird et al 2011b)
- Tracks from high fidelity tags deployed on Hawaiian monk seals under the U.S. Pacific Fleet monitoring program is showing more pelagic habitat use by monk seals than was previously known. Tagging and analysis is ongoing. Report provided in DoN 2010b and to be provided in 2011 Annual marine species monitoring report
- Stock assessment reports were released for the central north Pacific stock of blue and humpback whales in 2010 and Hawaii stock of minke, fin, sei, sperm, Blainville's beaked, Cuvier's beaked, Longman's beaked, dwarf sperm, killer, melon-headed, short-finned pilot, pygmy killer, and pygmy sperm whales; bottlenose, Fraser's, Risso's, rough-toothed, spinner, pan-tropical spotted, and striped dolphins; and Hawaiian monk seals in 2010 (Caretta et al 2011). A stock assessment report for the Pacific Islands Regional Complex (formerly only Hawaii) stock of false killer whales was also released in 2010 (Caretta et al 2011).
- NMFS released a proposal to expand the existing critical habitat for the Hawaiian monk seal by extending the current designation in the Northwestern Hawaiian Islands out to the 500-m depth contour and including near shore areas of the main Hawaiian Islands. (NMFS 2011d)

5. HARASSMENT AUTHORIZATION REQUESTED

There are no changes to Chapter 5 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011).

Therefore, pursuant to 50CFR§216.172, the Navy requests for the following for the two-year - 2012 and 2013 authorization:

Table 2. Level B and Level A harassment authorization request

Level B Harassment	Annual	Two-Year
Mysticetes		
Humpback whale (*Megaptera novaeangliae*)	9894	19788
Minke whale (*Balaenoptera acutorostrata*)	70	140
Sei whale (*Balaenoptera borealis*)	46	92
Fin whale (*Balaenoptera physalus*)	46	92
Bryde's whale (*Balaenoptera edeni*)	70	140
Odontocetes		
Sperm whales (*Physeter macrocephalus*)	800	1600
Pygmy sperm whales (*Kogia breviceps*)	952	1904
Dwarf sperm whale (*Kogia sima*)	2334	4668
Cuvier's beaked whale (*Ziphius cavirostris*)	1265	2530
Blainville's beaked whale (*Mesoplodon densirostris*)	393	786
Longman's beaked whale (*Indopacetus pacificus*)	116	232
Rough-toothed dolphin (*Steno bredanensis*)	1185	2370
Bottlenose dolphin (*Tursiops truncatus*)	807	1614
Pan-tropical dolphins (*Stenella attenuata*)	2419	4838
Spinner dolphins (*Stenella longirostris*)	463	926
Striped dolphins (*Stenella coeruleoalba*)	3530	7060
Risso's dolphin (*Grampus griseus*)	547	1094
Melon-headed whale (*Peponocephala electra*)	657	1314
Fraser's dolphin (*Lagenodelphis hosei*)	1372	2744
Pygmy killer whale (*Feresa attenuata*)	216	432
False killer whale (*Pseudorca crassidens*)	51	102
Killer whale (*Orcinus orca*)	51	102
Short-finned pilot whale (*Globicephala macrorynchus*)	1978	3956
Pinnipeds		
Hawaiian monk seal (*Monachus schauinslandi*)	121	242

Level A Harassment and/or Mortality over the 5-Year Authorization	**Annual**	**Five-Year**
Odontocetes		
Pygmy and dwarf sperm whales (*Kogia spp*)	n/a	10
Cuvier's beaked whale (*Ziphius cavirostris*)	n/a	10
Blainville's beaked whale (*Mesoplodon densirostris*)	n/a	10
Longman's beaked whale (*Indopacetus pacificus*)	n/a	10
Bottlenose dolphin (*Tursiops truncatus*)	n/a	10
Pan-tropical dolphins (*Stenella attenuata*)	n/a	10
Striped dolphins (*Stenella coeruleoalba*)	n/a	10
Melon-headed whale (*Peponocephala electra*)	n/a	10
Pygmy killer whale (*Feresa attenuata*)	n/a	10
Short-finned pilot whale (*Globicephala macrorynchus*)	n/a	10

6. NUMBERS AND SPECIES TAKEN

There are no changes to Chapter 6 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011 except the clarification noted below.

The estimated marine mammal exposures are based on the probability of the animals occurring in the area when a training event is occurring, and this probability does not change based on the use of TDFDs or implementation of mitigation measures (i.e., the exposure model does not account for how the charge is initiated and assumes no mitigation is being implemented). Therefore, the Navy is not requesting a change to the take authorization and the original modeling results presented in the Navy's 2008 Request for Letter of Authorization and updates (DoN 2007, 2008a and b) remains applicable.

7. IMPACTS TO MARINE MAMMAL SPECIES OR STOCKS

There are no changes to Chapter 7 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

8. IMPACT ON SUBSISTENCE USE

There are no changes to Chapter 8 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

9. IMPACTS TO THE MARINE MAMMAL HABITAT AND THE LIKELIHOOD OF RESTORATION

There are no changes to Chapter 9 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

10. IMPACTS TO MARINE MAMMALS FROM LOSS OR MODIFICATION OF HABITAT

There are no changes to Chapter 10 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

11. MEANS OF EFFECTING THE LEAST PRACTICABLE ADVERSE IMPACTS – MITIGATION MEASURES

There are no changes to Chapter 11 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011 except where noted below.

Current Mitigations:

Mitigation for Demolitions and Mine Countermeasure (MCM) Training (Up to 20 lb).

(i) Exclusion Zones – Explosive charges shall not be detonated if a marine mammal is detected within 700 yards (640 m) of the detonation site.

(ii) Pre-Exercise Surveys – For MCM training activities, the Navy shall conduct a pre-exercise survey within 30 minutes prior to the commencement of the scheduled explosive event. The survey may be conducted from the surface, by divers, and/or from the air. If a marine mammal is detected within the survey area, the exercise shall be suspended until the animal voluntarily leaves the area.

(iii) Post-Exercise Surveys - Surveys within the same radius shall also be conducted within 30 minutes after the completion of the explosive event.

(iv) Reporting – Any evidence of marine mammals injured or killed by the Navy's action shall be reported to NMFS.

(v) Mine Laying Training – Though mine laying training operations involve aerial drops of inert training shapes on floating targets, measures 1, 2, and 3 for Demolitions and Mine countermeasures (above) will apply to mine laying training. To the maximum extent feasible, the Navy shall retrieve inert mine shapes dropped during Mine Laying Training.

Revised Mitigations:

Revised Mitigations: Mine Neutralization Training Involving Underwater Detonations (up to 20-lb charges):

The current mitigation measures prohibit the use of TDFDs when conducting mine neutralization events and are therefore not practicable from a military readiness perspective for the reasons described in Chapter 1. The following revisions to selected measures will minimize the risk of injury and mortality to marine mammals during the use of TDFDs.

The following recommended procedures are specific to exercises conducted within the Hawaii Range Complex. Exercises conducted in other Navy range complexes may require adjusting procedures, sizes of buffer zones, duration of time-delays, etc. to ensure practicability of implementation and effectiveness at minimizing injury and mortality of marine mammals.

Measure A: This activity shall only occur in the Hawaii Range Complex

No change to this measure.

Measure B: Visual Observation and Buffer Zone

As discussed in Chapter 6, the estimated potential for marine mammals to be exposed during mine neutralization training events does not change with the use of TDFDs. This is due to the fact that estimated exposures are based on the probability of the animals occurring in the area when a training event is occurring, and this probability does not change because of a time-delay. However, what does change is the potential effectiveness of the current mitigation that is implemented to reduce the risk of exposure.

The locations within the HRC in which training with TDFDs most often takes place are close to shore (~3-6 nm) and in shallow water (~10-20 m depth). As part of the annual LOA requirements, the Navy has conducted monitoring in this area during training events from 2009 to 2011 and only spinner dolphins (on one occasion) and green sea turtles (regularly) have been sighted. Based on the training location, description of the area, and data from recent monitoring surveys, large whales and species that prefer deep or offshore waters are not expected to occur in this area with any regularity. Although not observed by EOD or monitoring surveys, it is possible that Hawaiian monk seals and other dolphin species such as bottlenose may be found in the area. Based upon the potential for protected species to be in the vicinity, the buffer zones need to be revised to further reduce potential impacts to these species when using a TDFD. However, mitigation measures apply to all species and will be implemented if any marine mammal species is sighted.

Pursuant to the NMFS 2011 Letter of Authorization (NMFS 2011a) for all Navy training covered in the HRC OEIS, the Navy currently has authorization for the take of delphinid species including 1,185 rough toothed dolphins, 807 bottlenose dolphins, 2,419 pantropical spotted dolphins, 463 spotted dolphins as well as 121 Hawaiian monk seals through Level B harassments, and Level A and/or mortality of 10 bottlenose dolphins and pantropical spotted dolphins among others. Since the Navy does not currently have authorization for any Level A exposures to Hawaiian monk seals or dolphins known to utilize areas where TDFD's may occur, the buffer zone needs to be revised to more effectively mitigate any potential exposures within the Level A zone. Therefore, the objective of Navy's revised mitigation measures will be to further minimize the risk of marine mammal exposure within the injury zones for 5 lb, 10 lb and 15-20 lb charges. Since the injury zone is larger than the zone where mortality could potentially occur, the revised mitigation will also reduce the risk of mortality.

Derivation of Time Delayed Mitigation Zones

The underwater zones of influences (ZOI) effectively represent a modeled mitigation zone that would be established around each detonation point based upon a net explosive weight to reduce the risk of injury/mortality to marine mammals. While the ZOIs vary between the different types of underwater detonation training, the Navy is proposing to establish an expanded 700 yard mitigation zone for all positive control (RFD) underwater detonations conducted within the HRC and a 1,000-1,500 yard mitigation zone around all TDFD underwater detonations.

To increase the effectiveness of the shallow water mitigation zone when using time-delayed detonations, an additional buffer zone is added to the existing Navy modeled ZOI for a particular charge weight.

In essence, this should allow sighting of marine mammals outside a final mitigation zone swimming into the zone prior to starting a time-delay detonation.

Final TDFD mitigation zones are determined in a three step process:

1) A swim speed and time factor is generated from 5-10 minutes. Onto each range, another 200 yards is added as a still additional buffer to account for varying individual swim speed;

2) The just calculated swim speed-time-buffer range is added to SSTC specific model results showing range to the applicable NMFS injury criteria;

3) Finally, the Navy rounds the step 2 ranges to appropriate mitigation ranges more likely to be practical in the field.

1) Swim Speed Estimation:

Using an average swim speed of 3 knots (102 yd/min) for a delphinid, the approximate distance that an animal would typically travel within a given time-delay period between five to ten minutes can be estimated (Table 3).

To account for the differences between species or faster swimming individuals within a species, the Navy and NMFS also agreed to add still another 200 yards to the original 3 knot derived ranges. Table 3 shows both the initial 3 knot range plus the additional 200 yard buffer.

Table 3. Potential Distance Traveled Based on Swim Speed and Length of Time-Delay and an Additional 200 Yard Buffer

Type	Swim Speed	Time-delay	Potential Distance Traveled	Potential Distance Traveled with Additional 200 Yd Buffer
Dolphin/Seal*	102 yards per minute	5 min	510 yards	710 yards
		6 min	612 yards	812 yards
		7 min	714 yards	914 yards
		8 min	816 yards	1,016 yards
		9 min	918 yards	1,118 yards
		10 min	1,020 yards	1,220 yards

*** Hawaiian monk seal swimming speeds are not known, however, they are assumed to swim slower than dolphins. Therefore, the dolphin swimming speed estimate is conservatively used for seals as well as dolphins.**

2) Zone of Influence and swim speed time buffer addition:

Based upon acoustic propagation modeling conducted as part of the Silver Strand Training Complex (and applied here) and anticipated ZOI to NMFS injury criteria (13.0 psi-msec) by training event type and charge weight, potential dolphin travel distances by time at 3 knots plus buffer can be added to event specific ZOI to produce a matrix of charge weight, selected by delay time, and applicable buffer zone (Table 4).

As long as animals are not observed within a given time-delayed mitigation zone before the time-delay detonation is set, then the animals would be unlikely to swim into the injury zone from outside the area within the time-delay window.

Table 4. Revised Radius (yd) for TDFDs Based on Size of Charge Size, Length of Time-Delay and an Additional Buffer from Table 3

(Table Caveat: these are not the Navy's final mitigation zones which are shown in Table 5. This Table is provided to show the initial math applicable to each charge weight and time combination)

Charge Weight (NEW) *	Navy Modeled ZOI to injury (13.0 psi-msec)	Time (in minutes)					
		5 min	6 min	7 min	8 min	9 min	10 min
5 lb	80 yards	80+710= 790 yards	80+812= 892 yards	80+914= 994 yards	80+1,016= 1,096 yards	80+1,118= 1,198 yards	80+1,220= 1,300 yards
10 lb	160 yards	160+710= 870 yards	160+812= 972 yards	160+914= 1,074 yards	160+1,016= 1,176 yards	160+1,118= 1,278 yards	160+1,220= 1,380 yards
15-20 lb **	360 yards	360+710= 1,070 yards	360+812= 1,172 yards	360+914= 1,274 yards	360+1,016= 1,376 yards	360+1,118= 1,478 yards	360+1,220= 1,580 yards

* for charge weights lower than those shown here, the next highest charge weight will be used

**Modeled ZOI are variable due not only to NEW, but also to event categories and how the charge is placed and detonated in the water column in likely training scenarios. Under these considerations, 15 and 20 lb NEW have a maximum injury ZOI of 360 yards which is used in this table.

3) Navy FINAL TDFD detonation mitigation zones

Finally, to create a better marine mammal risk mitigation regime that is likely to achieve better success through more practical execution, Navy divided the span of training events (as derived in Table 3) into those requiring at 1,000 yard buffer zone (with 2 boats mitigation), and those requiring greater than a 1,400 yard buffer zone (3 boats mitigation, or 2 boats and 1 helicopter).

Table 5 shows the Navy's final mitigation zones and application for HRC TDFD underwater detonations. This required in most cases rounding (most upward) the calculated ranges from Table 4 to the appropriate range category (1,000, 1,400, 1,500 yards).

These new mitigation zones and survey protocol are supportable from an operational perspective and will result in minimal risk of marine mammal injury or mortalities. The zones and the number of boats/helicopters used will allow for a thorough survey of the area in the weather conditions and sea states typically experienced during a training event.

Table 5. Navy's New Mitigation Zone Radius for TDFDs within HRC based on size of charge and length of time-delay.

		Time Delay					
		5 min	6 min	7 min	8 min	9 min	10 min
Charge Size * (lb NEW)	5 lb	1,000 yards	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards
	10 lb	1,000 yards	1,000 yards	1,000 yards	1,400 yards	1,400 yards	1,400 yards
	15-20 lb	1,000 yards	1,000 yards	1,400 yards	1,400 yards	1,500 yards	1,500 yards

* For charge weights lower than those shown here, the next highest charge weight will be used (ex. 3.5 NEW charge would use the 5 lb mitigation range).

Navy mitigation applied:

1,000 yd = minimum of 2 observation boats

1,400/1,500 yd = minimum of 3 observation boats or 2 boats and 1 helicopter

Mitigation Measures for Underwater Detonations Using Positive Control

1. Underwater detonations using positive control devices will only be conducted during daylight.

2. A mitigation zone of 700 yards will be established around each underwater detonation point.

3. A minimum of two boats, including but not limited to small zodiacs and 7-m Rigid Hulled Inflatable Boats (RHIB) will be deployed. One boat will act as an observer platform, while the other boat is typically the diver support boat.

4. Two observers with binoculars on one small vessel will survey the detonation area and the mitigation zone for marine mammals from at least 30 minutes prior to commencement of the scheduled explosive event and until at least 30 minutes after detonation.

5. In addition to the dedicated observers, all divers and boat operators engaged in detonation events can potentially monitor the area immediately surrounding the point of detonation for marine mammals (and other protected species such as sea turtles).

6. If a marine mammal is sighted within the 700 yard mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.

7. Immediately following the detonation, visual monitoring for marine mammals within the mitigation zone will continue for 30 minutes. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Office. Using Marine Mammal Stranding communication trees and contact procedures established for the HRC, the Navy will report these events to the Stranding Coordinator of NMFS' Pacific Islands Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate location in reference to an established HRC land feature), species description (if known), and indication of the animals status.

Mitigation Measures for Underwater Detonations Using Time-Delay (TDFD Detonations Only)

1. Underwater detonations using timed delay devices will only be conducted during daylight.

2. Time-delays longer than 10 minutes will not be used. The initiation of the device will not start until the mitigation area below is clear for a full 30 minutes prior to initiation of the timer.

3. A mitigation zone will be established around each underwater detonation location based on charge weight and length of time-delay used. A mitigation zone will be established around each underwater detonation location as indicated in Table 11-3 based on charge weight and length of time-delay used. When conducting the surveys within a mitigation zone (either 1,000 or $\geqslant$1,400 yards), boats will position themselves near the mid-point of the mitigation zone radius (but always outside the detonation plume radius/human safety zone) and travel in a circular pattern around the detonation location surveying both the inner (toward detonation site) and outer (away from detonation site) areas.

4. Shallow water TDFD detonations 1,000 yards:

- A minimum of 2 boats will be used to survey for marine mammals (and other marine species such as diving birds and protected species such as sea turtles) at mitigation ranges of 1,000 yards.

- When using 2 boats, each boat will be positioned on opposite sides of the detonation location, separated by 180 degrees.
- Two observers in each of the boats will conduct continuous visual survey of the mitigation zone for the entire duration of a training event.
- To the best extent practical, boats will try to maintain a 10 knot search speed. This search speed was added to ensure adequate coverage of the buffer zone during observation periods. While weather conditions and sea states may require slower speeds in some instances, 10 knots is a prudent, safe, and executable speed that will allow for adequate surveillance. For a 1,000 yd radius buffer zone a boat travelling at 10 knots and 500 yards away from the detonation point would circle the detonation point 3.22 times during a 30 minute survey period. By using 2 boats, 6.44 circles around the detonation point would be completed in a 30 minute span.

5. Shallow water TDFD detonations ≥1,400 yards:

- When using 3 (or more) boats, each boat will be positioned equidistant from one another (120 degrees separation for 3 boats, 90 degrees separation for 4 boats, etc.).
- For a 1,400 yd radius mitigation zone, a 10 knot speed results in 2.3 circles for each of the three boats, or nearly 7 circles around the detonation point over a 30 minute span
- If available, aerial visual survey support from Navy helicopters can be utilized, so long as to not jeopardize safety of flight.
- Helicopters, if available, can be used in lieu of one of the boat requirements. Navy helicopter pilots are trained to conduct searches for relatively small objects in the water, such as a missing person. A helicopter search pattern is dictated by standard Navy protocols and accounts for multiple variables, such as the size and shape of the search area, size of the object being searched for, and local environmental conditions, among others.

8. A mitigation zone will be surveyed from 30 minutes prior to the detonation and for 30 minutes after the detonation.

9. Other personnel besides boat observers can also maintain situational awareness on the presence of marine mammals within the mitigation zone to the best extent practical given dive safety considerations. Divers placing the charges on mines will observe the immediate underwater area around a detonation site for marine mammals (and other marine species such as diving birds and sea turtles) and report sightings to surface observers.

10. If a marine mammal is sighted within an established mitigation zone or moving towards it, underwater detonation events will be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 minutes.

11. Immediately following the detonation, visual monitoring for affected marine mammals (and other species such as birds and sea turtles) within the mitigation zone will continue for 30 minutes.

12. Any marine mammal or sea turtle observed after an underwater detonation either injured or exhibiting signs of distress will be reported to via Navy operational chain of command to Navy environmental representatives from U.S. Pacific Fleet, Environmental Readiness Office. Using Marine Mammal Stranding communication trees and contact procedures established for the HRC, the Navy will report these events to the Stranding Coordinator of NMFS' Pacific Islands Regional Office. These voice or email reports will contain the date and time of the sighting, location (or if precise latitude and longitude is not currently available, then the approximate

location in reference to an established HRC land feature), species description (if known), and indication of the animals status.

12. MINIMIZATION OF ADVERSE EFFECTS ON SUBSISTENCE USE

There are no changes to Chapter 12 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

13. MONITORING AND REPORTING MEASURES

There are no changes to Chapter 13 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011 except where noted below.

A. FY11 (August 1, 2010 to August 1, 2011) Monitoring Accomplishments

In the HRC monitoring plan, as revised in the 2011 HRC LOA Renewal Application, the Navy proposed to continue implementing a diversity of field methods to gather field data from marine mammals and sea turtles in conjunction with training events. During the study year (August to August), U.S. Pacific Fleet implemented aerial and vessel surveys, embarked marine mammal observers on Navy platforms, deployed passive acoustic recording devices and tagged marine mammals. There were also additional monitoring efforts within HRC that were funded by the Energy and Environmental Readiness Division of the Chief of Naval Operations (OPNAV N45) and the Office of Naval Research (ONR).

A summary of Aug 2010 to Aug 2011 HRC monitoring major accomplishments are presented below and in Table 5. Detailed results provided in the annual monitoring report for 2011.

- Aerial Visual Survey
    - During Submarine Commanders Course (SCC) training events, aerial surveys were conducted by non-Navy aircraft in close-proximity (e.g. between 200 and 2,500 yards) to Navy surface vessels. For SCC, logistical challenges were overcome by close coordination with PMRF range and P-3 pilots to allow for survey aircraft to share airspace with P-3 and helicopters involved in several training scenarios. This continued success during seven SCC proves that during certain training events in the HRC contracted aircraft can be used to conduct behavioral monitoring of submerged and at-surface marine mammals during anti-submarine warfare (ASW) training events.

- Vessel Visual Survey
    - Vessel surveys were conducted several times during the year as well as in conjunction with the Koa Kai training exercise.

- Passive Acoustic Monitoring
    - Two autonomous devices deployed in 2010 were retrieved and detailed analysis is ongoing. Four additional devices were deployed and will gather data for the next six months near areas used for underwater detonations and anti-submarine warfare exercises.

    - Marine mammal acoustic data were recorded using the instrumented hydrophone range at Pacific Missile Range Facility. For the first year, data were collected during the Submarine Commanders Course. Data are currently undergoing analysis.

- Marine mammal observers (MMOs)
    - The Navy's lookout effectiveness study was continued by embarking Navy MMOs aboard surface ships involved in the Submarine Commanders Course off the PMRF range and Koa Kai in the offshore areas of the range complex.

- MMOs embarked on small Navy surface vessels with Explosive Ordnance Disposal teams from Mobile Dive and Salvage Unit One (MSDU-1). The MMOs observed marine mammals and sea turtles in an underwater detonation area as well as implementation of mitigation measures.

- Tagging
  - Ten monk seals were tagged on Oahu, Molokai and Kauai in collaboration with National Marine Fisheries Service, Pacific Islands Fisheries Science Center.
  - Four cetaceans were tagged off Kauai and Kaula. One additional deployment also occurred but resulted in a lost tag. Additional tags to make up short fall from 2010 were purchased however challenging field conditions and target species precluded additional tag deployments. The tags will be used during ongoing efforts.

Table 6. U.S. Navy funded marine mammal monitoring accomplishments within the Hawaii Range Complex from 1 August 2010 to 1 August 2011

Study Type	U.S. Navy EIS/LOA monitoring	Associated event type	U.S. Navy R&D funded monitoring	Associated event type	MMPA/ESA requirement	Total accomplished
Visual surveys (Studies 1,2,3,4,5)	1) 95.2 hrs – 11-23 Nov 2010 (vessel) 2) 14.1 hrs – 18-22 Nov 2010 (aerial) 3) 46.1 hrs – 16 Feb – 5 Mar 2011 (aerial) 4) 60.2 hrs 15-20 Feb (vessel) 5) 11.5 hrs Kaula survey 30 June 6) 72.7 hrs PMRF pre-SCC July/Aug (vessel)	1) Koa Kai (ASW) 2) Koa Kai (ASW) 3) SCC & USWEX (ASW) 4) SCC (ASW) 5) n/a 6) SCC (ASW)	Use of M3R array at PMRF for validation of species ID, animal localization February (baseline and during SCC) and July 2011.	SCC	120- 160 hours before, during and after ASW and/or explosives training events	299.8 hours of aerial and vessel surveys
Marine Mammal Observers (Studies 1,2,3,4,5)	1) 140.5 hrs - 12-17 Nov 2010 2) 118.0 hrs - 15-18 Feb 2011 3) 124.0 hrs - 19-22 Feb 2011 4) 11 hrs - 26-27 Apr 2011	1) Koa Kai (ASW) 2) SCC (ASW) 3) USWEX (ASW) 4) Underwater detonations	n/a	n/a	MMO team aboard Navy surface platforms during 2 ASW and 6 explosive events. (make up for FY10 shortfall of 1 ASW event)	3 ASW events and 4 explosive events. (Note: extra ASW event covers shortfall from next year.) *Note: Lookout effectiveness for 2 explosive events with MDSU-1 originally planned for July 2011 rescheduled for early August 2011*
Tagging (Studies 1,2, 3)	1) 10 Hawaiian monk seals tagged 2) 3 cetaceans tagged (pre-SCC Cascadia Research Collective effort off Kauai; 16-20 Feb) 3) 2 tag deployed in conjunction with M3R Jul -Aug 2011 (one successful)	1) ULT (ASW) 2) SCC (ASW) 3) USWEX (ASW)	Use of M3R array at PMRF for validation of species ID, animal localization February (baseline and during SCC) and July 2011.	SCC	Tag a goal of 15 individual marine mammals	10 Hawaiian monk seals tagged); 4 cetaceans tagged (additional one deployed but fell off) Continuing analyses of tag data from FY 10 monitoring
Passive Acoustic Monitoring (Studies 1, 2, 3)	1) 1 EAR deployed at Kaula; 30 June 2) 3 EAR deployments in vicinity of Kauai and Niihau, 18-31 July 3) Continue use of PMRF hydrophones to gather and analyze marine mammal acoustic data in conjunction w/ SCC	SCC (ASW)	Use of M3R array at PMRF for validation of species ID, animal localization February (baseline and during SCC) and July 2011.	SCC	4 PAM devices deployed through the year. Begin data analysis. Continue collaboration of data collection and analysis from additional N45/ONR-funded autonomous PAM devices. Continue use of the Pacific Missile Range Facility (PMRF) instrumented range hydrophones to gather and analyze marine mammal acoustic data.	Deployment of 1 EAR near Kaula Deployment of 3 EARS near Kauai/Niihau Analysis of 2 EARS from near Niihau, 4 near Oahu (historical) and 2 near Kauai (historical) Use of PMRF hydrophones to gather and analyze marine mammal acoustic data in conjunction w/ SCC

B. Adaptive Management Recommendations for 2012 to 2014 Monitoring In the Hawaii Range Complex

The Navy assembled a Scientific Advisory Group as well as convened monitoring meetings with NMFS, researchers and non-governmental organizations in October 2010 and June 2011 in the interest of soliciting input on monitoring objectives and methods. The June 2011 "Adaptive Management Meeting" was described in NMFS' Final Rule. The recommendations that were generated during those meetings are currently under review by the Navy and will be further discussed with NMFS at the annual Adaptive Management Meeting in October of 2011. Results will be used to revise and improve the monitoring program in the coming years, while maintaining the same level of overall effort. However, they are not available for incorporation into this Letter of Authorization renewal request.

C. 2012 -2014 Monitoring Commitments

Other than adding more flexible language to allow the PAM section, no changes are being recommended for 2012-2014 at this time (Table 6). Once review of current monitoring methods and metrics are completed, they will be incorporated into new monitoring plans. There is no firm timeline for this effort, but it is anticipated to be completed in the spring of 2012.

Table 7. 2012-14 monitoring commitments

Monitoring Technique	Implementation	
Visual Surveys (aerial or vessel) **STUDIES 1,2,3,4, 5**	120-160 hours before, during and after ASW training events including major training exercises (MTE), SCC, Unit Level Training (ULT) and/or explosive events.	Adaptive Management Review (AMR)
Marine Mammal Observers (MMO) **STUDIES 1,2,3, 4, 5**	MMO team aboard Navy surface platforms during 2 ASW and 6 explosive events	
Tagging **STUDIES 1,2, 3**	Tag a goal of 15 individual marine mammals	
Passive Acoustic Monitoring (PAM) **STUDIES 1,2, 3**	- Utilize a combination of autonomous recording devices, and/or sonobuoys and/or towed arrays to gather acoustic data. Continue collaboration of data collection and analysis from additional N45/ONR-funded autonomous PAM devices. Continue data analysis. - Continue use of the Pacific Missile Range Facility instrumented range hydrophones to gather and analyze marine mammal acoustic data.	

14. RESEARCH

There are no changes to Chapter 14 as described under NMFS January 2009 Final Rule (NMFS 2009b), Navy's 2011 Request for Letter of Authorization (DoN 2011), and NMFS subsequent 2011 Letter of Authorization issued 7 February 2011.

15. LIST OF PREPARERS

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