Request for 2012-2015 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 Mariana Islands Range Complex

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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
LOA	Letter of Authorization
MFAS	Mid-frequency Active Sonar
MIRC	Mariana Islands Range Complex
MMPA	Marine Mammal Protection Act
MTE	Major Training Exercise
NMFS	National Marine Fisheries Service
PAM	Passive Acoustic Monitoring
PIFSC	Pacific Islands Fisheries Science Center
RFD	Remote Firing Device
TDFD	Time-Delay Firing Device

1. INTRODUCTION AND DESCRIPTION OF ACTIVITIES

Under the provisions of the Marine Mammal Protection Act of 1972 (MMPA), this document is the annual 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 research[2] activities in the Mariana Islands Range Complex (MIRC).

Navy seeks an LOA renewal for the three year period from 15 August 2012 to 14 August 2015 to cover the taking of marine mammals, as described in the MMPA, incidental to training and research within the Mariana Islands Range Complex. The LOA renewal request builds upon eight prior documents – (1) the Navy's LOA Request from August 2008 (DoN 2008), (2) Navy's Update #1 to the Request for LOA (DoN 2009a), (3) Navy's Update #2 to the Request for LOA (DoN 2009b), (4) Navy's Update #3 to the Request for LOA (DoN 2009c), (5) Navy's Update #4 to the Request for LOA (DoN 2009d, (6) NMFS Proposed Rule (NMFS 2009), (7) NMFS Final Rule (NMFS 2010a) and (8) NMFS Letter of Authorization (NMFS 2011). Unless otherwise noted herein, there will not be a substantial modification to the described work, mitigation or monitoring undertaken during the upcoming 36 months. The Navy will submit monitoring and exercise reports required by 50 C.F.R. §216.175(c) through (j) by 15 April 2012.

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.

Table 1 shows the MMPA permit documentation applicable to the Mariana Islands Range Complex and NMFS' authorization as well as references the 1 February 2012 Final Rule that authorizes multi-year LOAs (NMFS 2012). Information contained in these references provide a complete description of the background for the Navy's request, an overview of the Mariana Islands Range Complex, a description of the specified activities, a description of marine mammals in the area, a discussion of potential effects or lack of effects of specified activities on marine mammal, mitigation, marine mammal monitoring, and associated reporting.

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

[2] Research is an informal designation for "research, development, testing, and evaluation (RDT&E)" as described by the Navy and NMFS in the references cited above

Table 1. Timeline of key Mariana Islands Range Complex MMPA documents

Timeline Date	From	Event	Reference
11 Aug 08	Navy	Request for Letter of Authorization (request for Incidental Harassment For the Mariana Islands Range Complex) submitted to NMFS Office of Protected Resources	DoN 2008
18 Feb 09	Navy	Request for Letter of Authorization Update #1 submitted to NMFS Office of Protected Resources	DoN 2009a
6 Apr 09	Navy	Request for Letter of Authorization Update #2 submitted electronically to NMFS Office of Protected Resources	DoN 2009b
23 Jun 09	Navy	Request for Letter of Authorization Update #3 submitted electronically to NMFS Office of Protected Resources	DoN 2009c
20 Oct 09	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In the Mariana Islands Range Complex; Proposed Rule published in Federal Register (74 FR 53796)	NMFS 2009
12 Nov 09	Navy	Request for Letter of Authorization Update #4 submitted electronically to NMFS Office of Protected Resources	DoN 2009d
4 May 10	Navy	Mariana Islands Range Complex Environmental Impact Statement\Overseas Environmental Impact Statement- Final May 2010	DoN 2010a
21 May 10	Navy	Mariana Islands Range Complex Monitoring Plan-Final May 2010	DoN 2010b
3 Aug 10	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In Mariana Islands Range Complex; Final Rule published in Federal Register (75 FR 148)	NMFS 2010a
12 Aug 10	NMFS	Letter of Authorization to take marine mammals incidental to Navy exercises conducted in Mariana Islands Range Complex issued	NMFS 2010b
1 Dec 10	NMFS	Clarification and amendment of Navy requirement for compliance with 2009 Integrated Comprehensive Monitoring Program Plan	NMFS 2010c
9 Aug 11	NMFS	Letter of Authorization to take marine mammals incidental to Navy exercises conducted in Mariana Islands Range Complex issued	NMFS 2011
1 Feb 12	NMFS	Taking and Importing Marine Mammals; U.S. Navy Training In 12 range complexes and U.S. Air Force Space Vehicle and Test Flight Activities in California; Final Rule published in Federal Register (77 FR 4917)	NMFS 2012

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' 9 August 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 in southern California, an evaluation of current mitigation measures has been conducted for mine neutralization events occurring within the Mariana Islands Range Complex. This Request for Letter of Authorization provides additional details on how mine neutralization is conducted in the MIRC, 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) in addition to remote firing devices. The annual number of mine neutralization events (50 events) would remain unchanged from the 2009 Final Rule (NMFS 2009).

Overall Operational Mission and Types of Detonation Initiating Devices

Explosive Ordnance Disposal (EOD) personnel (including Mobile Dive and Salvage Unit (MDSU)) 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 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 most common positive control firing is the 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 of TDFD eliminates the need to re‐deploy swimmers from a helicopter or boat to recover

[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.

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.

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 (e.g. 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).

In summary, RFDs introduce operationally unsound tactics, thereby increasing future risks to Navy dive teams. Therefore, they are not considered a practicable alternative for all underwater detonations. It is a requirement (NTTL 18JUL11, OPNAVINST 3501.97H) 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 MIRC.

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 EOD/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 August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

3. MARINE MAMMAL SPECIES AND NUMBERS

There are no changes to Chapter 3 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

4. AFFECTED SPECIES STATUS AND DISTRIBUTION

There are no changes to Chapter 4 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

5. HARASSMENT AUTHORIZATION REQUESTED

There are no changes to Chapter 5 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

Therefore, pursuant to 50CFR§216.172, the Navy requests for the following for the three year 2012-2015 authorization.

Table 2. Level B and Level A harassment authorization request

Level B Harassment	**Annual**	**Three-Year**
Mysticetes		
Humpback whale (*Megaptera novaeangliae*)	268	804
Fin whale (*Balaenoptera physalus*)	12	36
Blue whale (*Balaenoptera musculus*)	4	12
Minke whale (*Balaenoptera acutorostrata*)	445	1335
Bryde's whale (*Balaenoptera edeni*)	457	1371
Sei whale (*Balaenoptera borealis*)	12	36
Odontocetes		
Sperm whale (*Physeter macrocephalus*)	306	918
Killer whale (*Orcinus orca*)	230	690
Pygmy or dwarf sperm whale (*Kogia breviceps or K. sima*)	6706	20118
Blainville's beaked whale (*Mesoplodon densirostris*)	770	2310
Cuvier's beaked whale (*Ziphius cavirostris*)	3628	10884
Ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*)	430	1290
Longman's beaked whale (*Indopacetus pacificus*)	206	618
Short-finned pilot whale (*Globicephala macrorynchus*)	2274	6822
Melon-headed whale (*Peponocephala electra*)	2863	8589
Pygmy killer whale (*Feresa attenuata*)	160	480
False killer whale (*Pseudorca crassidens*)	1289	3867
Striped dolphin (*Stenella coeruleoalba*)	8858	26574
Short-beaked common dolphin (*Delphinus delphis*)	943	2829
Risso's dolphin (*Grampus griseus*)	6773	20319
Bottlenose dolphin (*Tursiops truncatus*)	171	513
Fraser's dolphin (*Lagenodelphis hosei*)	4615	13845
Pan-tropical spotted dolphin (*Stenella attenuata*)	32499	97497

Rough-toothed dolphin (*Steno bredanensis*)	241	723
Spinner dolphin (*Stenella longirostris*)	2144	6432
Unidentified delphinid	1538	4614

Level A Harassment and/or Mortality over the 5-Year Authorization	**Annual**	**Five-Year**
Odontocetes		
Sperm whale (*Physeter macrocephalus*)	1	5
Pan-tropical spotted dolphin (*Stenella attenuata*)	1	5
Blainville's beaked whale (*Mesoplodon densirostris*)	n/a	10
Cuvier's beaked whale (*Ziphius cavirostris*)	n/a	10
Ginkgo-toothed beaked whale (*Mesoplodon ginkgodens*)	n/a	10
Longman's beaked whale (*Indopacetus pacificus*)	n/a	10

6. NUMBERS AND SPECIES TAKEN

There are no changes to Chapter 6 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

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 2009a, b, c, and d) remains applicable.

7. IMPACTS TO MARINE MAMMAL SPECIES OR STOCKS

There are no changes to Chapter 7 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

8. IMPACT ON SUBSISTENCE USE

There are no changes to Chapter 8 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

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

There are no changes to Chapter 9 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

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

There are no changes to Chapter 10 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

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

There are no changes to Chapter 11 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011) except where noted below.

Current Mitigations:

Mitigation for Demolitions and Mine Countermeasure (MCM) Training (Up to 10 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 10-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 Mariana Islands 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.

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 MIRC in which training with TDFDs most often takes place are close to shore (~3-6 nm) and in shallow water (~10-20 m depth). 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. 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 2011) for all Navy training covered in the MIRC OEIS, the Navy currently has authorization for the take of delphinid species including 171 bottlenose dolphins, 32,499 pan-tropical spotted dolphins, 241 rough-toothed dolphins and 2,144 spinner dolphins through Level B harassments, and Level A and/or mortality of 1 pan-tropical spotted dolphin, 1 sperm whale and several species of beaked whales. Since the Navy does not currently have authorization for Level A exposures to most near shore dolphins (e.g. spinner and bottlenose dolphins) presumed 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 15-29 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 MIRC 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	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

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 (yard) 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

* 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 a less than 1,400 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 MIRC 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 MIRC 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

* 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 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 shall only be conducted during daylight hours.

2. A mitigation zone of 700 yd shall be established around each underwater detonation point.

3. A minimum of two boats shall be deployed; one boat will act as an observer platform, while the other boat will provide diver support.

4. Two observers will survey the detonation area and the mitigation zone for marine mammals beginning at least 30 min prior to the scheduled explosive event and lasting until at least 30 min following detonation.

5. If a marine mammal is sighted within the 700-yd mitigation zone or moving towards it, underwater detonation events shall be suspended until the marine mammal has voluntarily left the area and the area is clear of marine mammals for at least 30 min.

6. Immediately following the detonation, visual monitoring for affected marine mammals within the monitoring zone would continue for 30 min.

7. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress would be reported 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 MIRC, the Navy would report these events to the Stranding Coordinator of NMFS' Pacific Islands Regional Office. These reports would contain the date and time of the sighting, location, species description, and indication of the animal's status.

Mitigation for Underwater Detonations Using Time-Delay Firing Devices (TDFDs).

1. Underwater detonations using TDFDs shall only be conducted during daylight hours.

2. Time-delays longer than 10 min shall not be used.

3. Initiation of the firing device shall not start until the mitigation zone is clear for a full 30 min prior to initiation of the timer.

4. A monitoring and mitigation zone shall be established around each underwater detonation location, as indicated in Table 5 based on charge weight and length of time-delay used.

5. When conducting surveys, boats shall position themselves near the mid-point of the mitigation zone radius (but always outside the detonation plume/human safety zone) and travel in a circular pattern around the detonation location, surveying both the inner and outer areas.

6. To the best extent practical, boats shall maintain a 10-knot search speed to ensure adequate coverage of the mitigation zone.

TDFD detonations with a mitigation zone of <1,400 yd:

1. A minimum of two boats shall be used to survey for marine mammals.

2. Each boat shall be positioned on opposite sides of the detonation location, separated by 180 degrees.

TDFD detonations with a mitigation zone of ⩾1,400 yd:

1. A minimum of three boats or two boats and one helicopter shall be used to survey for marine mammals.

2. When using at least three boats, each boat would be positioned equidistant from one another (120 degrees separation for three boats, 90 degrees separation for four boats, etc.)

3. A helicopter, if available, can be used in lieu of one of the required boats.

4. Two dedicated observers in each boat would conduct continuous visual surveys of the monitoring zone for the duration of the training event.

5. Monitoring zones would be surveyed beginning 30 min prior to detonation and for 30 min after detonation.

6. Divers placing the charges on mines shall observe the immediate underwater area around a detonation site for marine mammals and report sightings to surface observers.

7. If a marine mammal is sighted within an established mitigation zone or moving towards it, underwater detonation events would be suspended until the marine mammal voluntarily leaves the area and the area is clear of marine mammals for at least 30 min.

8. Immediately following the detonation, visual monitoring for affected marine mammals within the monitoring zone would continue for 30 min.

9. Any marine mammal observed after an underwater detonation either injured or exhibiting signs of distress would be reported 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 MIRC, the Navy would report these events to the Stranding Coordinator of NMFS' Pacific Islands Regional Office. These reports would contain the date and time of the sighting, location, species description, and indication of the animal's status.

12. MINIMIZATION OF ADVERSE EFFECTS ON SUBSISTENCE USE

There are no changes to Chapter 12 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

13. MONITORING AND REPORTING MEASURES

There are no changes to Chapter 12 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011) except where noted below.

Monitoring Accomplishments

In the MIRC monitoring plan, as revised in the 2011 MIRC LOA Renewal Request, the Navy proposed to continue implementing a diversity of field methods to gather field data from marine mammals and sea turtles. During the study year (February to February), U.S. Pacific Fleet implemented small vessel surveys, deployed passive acoustic recording devices and analyzed acoustic recordings from the Navy's 2007 MISTCS line-transect survey.

A summary of February 2011 to February 2012 MIRC monitoring major accomplishments are presented below and in Table 6. Detailed results will be provided in the 2011 MIRC annual monitoring report.

Summary of Monitoring Conducted (February 2011 to February 2012)

- Visual Survey
    - 45 days of non-systematic visual surveys from small boats were conducted for marine mammals and sea turtles around the islands of Rota, Guam, Saipan, Aguijan and Tinian
    - The surveys covered 2,244 nmi of trackline over 276 hours on effort
    - A total of 47 groups of cetaceans and 6 sea turtles were sighted. Sightings that were identified to species included green sea turtles, bottlenose, pan-tropical spotted, and spinner dolphins; sperm, short-finned pilot, pygmy killer and dwarf sperm whales
    - 12,612 photographs taken during the surveys will be provided to PIFSC for their photo-identification catalog

- Mariana Island Sea Turtle and Cetacean Survey (MISTCS) acoustic data analysis
    - Estimate of minke whale abundance application of distance sampling methodology to towed array passive acoustic detections and line transect observations
    - Classification of delphinid whistles to four associated acoustic groups
    - Improved detection function for acoustic sperm whale encounters and quantification that the majority of recorded sperm whale codas were from the "normal dialect" or clan of sperm whales
    - Comparison of humpback whale song fragments to Hawaii humpback whale song of the same time period
    - Characterization of sei whale vocalizations
- Passive Acoustic Monitoring

- Four Ecological Acoustic Recorded (EAR) buoys were deployed in September 2011 – two off Guam, one off Saipan and one off Tinian. They will be retrieved during the winter 2012 visual survey and analysis will begin upon retrieval.

Table 6. U.S. Pacific Fleet funded marine mammal monitoring accomplishments within the Mariana Islands Range Complex from February 2011 to February 2012.

Field Method	Monitoring Commitment	Total accomplished
Visual surveys	Conduct summer and winter visual surveys using a small boat and/or airplane around Guam, Tinian, Rota and Saipan. Visual surveys would integrate methods such as photo ID that provide data that can be used for distribution and abundance. 45 days total.	Conducted 45 days of summer and winter visual surveys using a small boat around Guam, Tinian, Rota, Aguijan and Saipan. 12,612 photographs were collected for use in photo identification studies.
MISTCS data analysis	Analyze existing acoustic data set from 2007 MISTCS	Analyzed existing acoustic data set from 2007 MISTCS survey.
Passive Acoustic Monitoring	Deploy four passive acoustic monitoring devices around the Mariana Islands that are capable of gathering data throughout the year.	Deployed four passive acoustic monitoring devices around the Mariana Islands for one year.

Adaptive Management and Yearly Monitoring Commitments

In 2011, the Navy convened a Scientific Advisory Group (SAG) as well as hosted adaptive management monitoring meetings with NMFS, researchers and non-governmental organizations. The SAG input as well as subsequent input from researchers with specific knowledge of the Mariana Islands is being used to revise the MIRC monitoring plan for 2012-2015. Methods and region-specific study questions may change however overall effort will be comparable to previous years. The revised monitoring plan will be provided as an appendix to the 2012 MIRC Annual Monitoring Report.

14. RESEARCH

There are no changes to Chapter 14 as described under NMFS August 2010 Final Rule (NMFS 2010a), Navy's 2008 Request for Letter of Authorization (DoN 2008), Navy's Request for Letter of Authorization Updates 1-4 (DoN 2009a, b, c, d) and NMFS 2011 Letter of Authorization issued August 2011 (NMFS 2011).

This section, therefore, remains as described in the Final Rule (NMFS 2010a) and 2011 Letter of Authorization (NMFS 2011).

15. LIST OF PREPARERS

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