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UNCLASSIFIED

2020 Annual Atlantic Fleet Training and Testing (AFTT) Exercise and Testing Report

14 November 2019 to 13 November 2020

11 FEBRUARY 2021

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ATLANTIC FLEET TRAINING AND TESTING ANNUAL EXERCISE AND TESTING REPORT

INTRODUCTION

The U.S. Navy prepared this Annual Exercise and Testing Report covering the period from 14 November 2019 to 13 November 2020 in compliance with the National Marine Fisheries Service (NMFS) Final Rule, Letters of Authorization (LOA), and Incidental Take Statements under the Marine Mammal Protection Act (MMPA) and Endangered Species Act (ESA) authorizations for the U.S. Navy's Atlantic Fleet Training and Testing (AFTT) Study Area.

This report is submitted as a combined report to present an overview of all U.S. Navy training and testing activities within the AFTT Study Area. This report also includes separately authorized Incidental Harassment Authorization reporting requirements for ICEX 2020, issued on January 30, 2020.

In the AFTT Final Rule and Letters of Authorization,[1] the following report subsections were specified and are present within this report:

(1) Major Training Exercises (MTEs)
- (i) Exercise information (for each MTE)
- (ii) Individual marine mammal sighting information for each sighting in each exercise when mitigation occurred
- (iii) Evaluation (based on data gathered during all MTEs) of the effectiveness of mitigation measures designed to minimize the received level to which marine mammals may be exposed. This evaluation must identify the specific observations that support any conclusions the Navy reaches about the effectiveness of the mitigation.

(2) Sinking Exercises (SINKEX)
- (i) Exercise information (gathered for each SINKEX)
- (ii) Individual marine mammal observation (by Navy Lookouts) information (gathered for each marine mammal sighting) for each sighting where mitigation was implemented

(3) Summary of Training Sources Used
- (i) Total annual hours or quantity (per the LOA) of each bin of sonar or other acoustic sources (pile driving and air gun activities)
- (ii) Total annual expended/detonated ordnance (missiles, bombs, sonobuoys, etc.) for each explosive bin
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- (ii) Total annual expended/detonated ordnance (missiles, bombs, sonobuoys, etc.) for each explosive bin
- (iii) Special Reporting Areas for Testing Active Sonar & In-Water Explosives

[1]AFTT Requirements for Monitoring and Reporting, 50 CFR 218.85(e)(1) through (e)(5). The reporting requirements are also delineated in section 7(e) of the Training Letter of Authorization and section 7(e) of the

Testing Letter of Authorization. ICE Exercise 2020 reporting requirements are delineated in section 6(a) of the Incidental Harassment Authorization.

(7) Geographic Testing Information Presentation

(8) ICE Exercise (ICEX) 2020 Training and Testing Activities

The information in this report represents the best practical data collection for this period. To provide accounting for the entire seven-year period of the authorization, Navy will also submit a 7-yr Close-out Exercise and Testing Report with final totals of authorized usage.

(1) AFTT – Major Training Exercises

This section summarizes authorized sonar use and marine mammal observations from MTEs conducted within the AFTT Study Area during the reporting period. The AFTT MTEs include Large Integrated Anti-Submarine Warfare, which consists of ***Composite Training Unit Exercises*** (C2X), and Medium Integrated Anti-Submarine Warfare, which consists of ***Fleet Exercises*** (FLEETEX) and ***Sustainment Exercises*** (SUSTEX).

(i) Exercise information

Table 1-1. MTEs conducted in the AFTT Study Area

(A) Exercise designator	(B) Date began and ended	(C) Location	(D) Number and types of active sonar sources used					(E) Number and types of passive acoustic sources used				(F) Number and types of of vessels, aircraft, and other platforms participating					
			Surface hull-mounted sonar	Submarine hull-mounted sonar	Helicopter dipping sonar	Aircraft sonobuoy	Towed countermeasure	Surface hull-mounted sonar	Submarine hull-mounted sonar	Aircraft sonobuoy	Towed array	CG	DDG	AH-60R dipping helo	MPRA	Submarines	Non-ASW surface ship
C2X	17 Jan – 13 Feb 2020	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Table 1-1 (continued). MTEs conducted in the AFTT Study Area

(A) Exercise designator	(B) Date began and ended	(C) Location	(G) Total hours of all active sonar source operation	(H) Total hours of each active sonar source bin																				(I) Wave height (high, low, average)
				LF5 (hours)	LF6 (hours)	MF1 (hours)	MF1K (hours)	MF3 (hours)	MF4 (hours)	MF5 (count)	MF10 (hours)	MF11 (hours)	MF12 (hours)	HF1 (hours)	HF4 (hours)	HF8 (hours)	ASW1 (hours)	ASW2 (count)	ASW3 (hours)	ASW4 (count)	ASW5 (hours)	TORP1 (count)	TORP2 (count)	SAS2 (hours)	
C2X	17 Jan – 13 Feb 2020	VCOA/CPOA/JAXOA	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

VCOA=Virginia Capes Operating Area; CPOA=Cherry Point Operating Area; JAXOA=Jacksonville Operating Area
* Information is presented in the classified version of this report.

(ii) Individual marine mammal sighting information for each sighting in each exercise when mitigation occurred

Table 1-2. AFTT MTE – Individual Marine Mammal and Sea Turtle Mitigation Sighting Information: C2X 17 Jan – 13 Feb 2020

(A) Date/time/location of sighting			(B) Species	(C) Number of individuals	(D) Initial detection sensor	(E) Indication of specific type of platform the observation was made from	(F) Length of time observers maintained visual contact with marine mammal(s) (min)	(G) Sea state (Beaufort scale)	(H) Visibility (nm)	(I) Sound source in use at time of sighting (Y/N)	(J) Indication of whether animal is <200 yd, 200-500 yd, 500-1000 yd, 1000-2000 yd, or >2000 yd from sonar source	(K) Mitigation implementation – whether operation of sonar sensor was delayed, or sonar was powered or shutdown, and how long the delay was	(L) If source in use was hull-mounted, true bearing of animal from the vessel, true direction of vessel's travel, and estimation of animal's motion relative to vessel	(M) Observed behavior – Lookouts must report, in plain language and without trying to categorize in any way, the observed behavior of the animal(s) and if any calves were present
26-Jan	1755Z	JAXOA	Whale	3	Vis	DDG	5	1	10	Y	<200	Sonar shutdown	Whales bearing 295T, ship course 320T, opening ship	Swimming
27-Jan	2012Z	JAXOA	Dolphin	2	Vis	DDG	10	1	10	Y	<200	Sonar shutdown	Dolphins bearing 010T, ship course 280T, paralleling ship	Swimming
28-Jan	2116Z	JAXOA	Dolphin	2	Vis	DDG	3	1	10	Y	<200	Sonar shutdown	Dolphins bearing 125T, ship course 215T, closing ship	Approaching to bow ride

(iii) Evaluation (based on data gathered during all exercises) of effectiveness

Between 14 November 2019 and 13 November 2020, there was one major training exercise (a C2X) in the AFTT Study Area. At least seven marine mammals were sighted within the mitigation zone while active sonar was energized during this exercise.

Table 1-3. AFTT MTEs and Associated Marine Mammal and Sea Turtle Mitigation Sightings

MTE Type	Month	# of Exercise Days	# of Ships Involved (MFAS and non-MFAS)	# of Mitigation Sightings	# of Animals
C2X	Jan – Feb 2020	28	14	3	7
	Total	**28**	**14**	**3**	**7**

Mitigation Effectiveness Discussion

During the reporting period, the two categories of mitigation measures (Procedural Mitigation and Mitigation Areas) outlined in the AFTT EIS and approved by NMFS were effective in appropriately mitigating exposure of marine mammals and seas turtles to mid-frequency active sonar. It should be noted that with or without mitigation, given the relative motion of ships maneuvering at-sea and the independent marine animal movement, the time any given animal would be exposed to active sonar from surface ships is likely to be limited. Fleet commanders and ship watch teams continue to improve individual awareness and enhance reporting practices. This improvement can be attributed to the various pre-exercise conferences, mandatory marine species awareness training, and making adjustments based upon the lessons learned. The mitigation zones were adhered to, and vessels and aircraft applied mitigation measures when marine mammals or sea turtles were visually observed within the requisite zones.

For AFTT MTEs, there were three mitigation events when sonar was shut down during ASW training. These events included two cases where active sonar was secured due to dolphins observed within the mitigation zone and one case where active sonar was secured due to whales observed within the mitigation zone (see Table 1-2).

Animals conducting deep dives were not observed during any of the MTEs. If exposure to any deep-diving animals did occur, Navy assesses that these animals would not be exposed to significant levels for long periods based on the moving nature of ships during active sonar use, and even less so from less frequent and lower power aircraft-deployed active sonar systems such as dipping sonar and sonobuoys. For instance, during a one-hour dive by a beaked whale or sperm whale, a ship moving at a nominal 10 knot speed could transit about 10 nm from its original location, well beyond ranges predicted to have significant exposures.

Table 1-4 contains all mitigation events where sonar was energized and the observed range was less than 1,000 yards. It should be noted that with or without mitigation, given the relative motion of ships maneuvering at sea and the independent marine animal movement, the time any given animal would be exposed to active sonar from surface ships is likely to be limited, as shown by the distances calculated in Table 1-4 Column 11.

Table 1-4. Estimated Exposures for Marine Animals in Mitigation Events at Ranges Less than 1,000 Yards

1) MTE	2) Month	3) Species sighted	4) Number of marine animals sighted	5) Platform	6) Range at which marine animal sighted (yds)	7) Mitigation action	8) Estimate MAX exposure PRIOR to mitigation (dB re 1uPa)[1]	9) Number of minutes sonar mitigation applied	10) Estimate exposure AFTER mitigation (dB re 1uPa)[1]	11) DISTANCE ship would have moved given length of mitigation and nominal 10-knot ship speed (yds)	12) Observed marine animal and vessel direction and estimated relative motion	13) Observed behavior
C2X	Jan	Whale	3	DDG	<200	Sonar shutdown	<189	12	None	4,000	Whales bearing 295T, ship course 320T, opening ship	Swimming
C2X	Jan	Dolphin	2	DDG	<200	Sonar shutdown	<189	10	None	3,333	Dolphins bearing 010T, ship course 280T, paralleling ship	Swimming
C2X	Jan	Dolphin	2	DDG	<200	Sonar shutdown	<189	3	None	1,000	Dolphins bearing 125T, ship course 215T, closing ship	Approaching to bow ride

[1]Estimated exposure based on 20Log[R] spherical spreading propagation loss for ranges less than 1,000 yards and where nominal active sonar Source Level (SL) assumed to be 235 dB for DDGs and CGs. Actual operating parameters and oceanographic condition likely result in lower exposure. This calculation assumes exposure prior to mitigation. Once animal was observed at the range indicated, applied mitigation would have resulted in much lower to no exposures.

Exposure Assessment

Estimated exposures within 2,000 yards can be determined based on standard formulas of how sound propagates in water. Spherical spreading is generally valid within 1,000 yards from the sound source, and can be expressed as spreading loss (in dB from a source) equals 20logR (with "R" being range from the source in yards). Spherical spreading loss in the first 1,000 yards equates to 60 dB of loss. At ranges between 1,000 and 2,000 yards a portion of the sound waves can become trapped in a surface duct or by the sea surface and bottom (depending on depth of the sound transmission) and may not expand vertically. The spreading wave in this case then forms an expanding cylinder. Cylindrical spreading loss in dB between two points can be calculated by using the formula (10logR2/R1), with "R2" being the longer range, and "R1" being 1,000 yards. Cylindrical spreading loss between 1,000 and 2,000 yards equates to an additional 3 dB of loss. For this assessment, Navy assumes the most conservative case where all the sound between 1,000 and 2,000 yards is trapped. Therefore, by the time the wave has propagated to 2,000 yards, the sonar signal strength has decreased by a minimum total of 63 dB. Using the AN/SQS-53 sonar as an example, transmitting at 235 dB and subtracting the 63 dB of spreading loss equates to an estimated sonar Receive Level (RL) of 172 dB at 2,000 yards. The spreading loss formulas used make very conservative assumptions about potential exposure. The formula is an estimation of spreading losses only and does not take into account other factors that could increase the total propagation losses such as oceanographic conditions, attenuation losses, scattering losses, and Navy-unique MFAS operating parameters which would result in slightly lower sonar transmit levels. Use of this approach to estimate potential RL at any given animal assumes the horizontal range from a visual sighting accounts for an animal across all depths at which an animal travels to predict the maximum, worst case potential exposure. In other words, this estimated worst case exposure is presented independent of the animal's actual depth level, since a) time and depth of current and previous dives cannot be deduced from a limited surface sighting, and b) oceanographic and tactical conditions influence actual sound propagation at different depths. Given the relative motion of ships and animals at sea, the time spent with any given exposure from surface ships is likely to be limited.

Passive sonar is an acoustic device used for listening to underwater sound and does not involve transmitting sound into the water column. Passive sonar use is driven by the tactical nature of an ASW exercise or training event, and is employed whenever possible. Given the nature of passive sonar technology and underwater sound propagation, determining range and absolute position of a marine animal is exceedingly difficult and generally not possible with any single ship-based passive sonar. Skilled operators or unique circumstances may sometimes allow real-time or near-real time estimations of range to a vocalizing marine animal at the expense of interrupting the ship's ASW training at the time. Active sonar, on the other hand, is critical in providing range and bearing to potential

underwater submarines and mines. In addition, passive sonar can only detect marine animals that are vocalizing (i.e., making underwater sound as part of communication and echolocation). Marine animal vocalization is based on individual needs at a particular moment, species-level foraging, and mating strategies, and other oceanographic or biological factors. For instance, for some species, it is believed only males typically vocalize (e.g., humpback whales, blue whales, fin whales, and minke whales). Depending on oceanographic conditions and animal source levels, when marine animals do vocalize, sounds can easily travel one to several tens of kilometers (km) (0.5 nautical mile (nm) to tens of nm) for some mid-to-low frequency animals, and tens to hundreds of km for very low frequency baleen whales (i.e., blue and fin whales). These ranges demonstrate that even if the marine animal vocalization can be detected, it does not mean the animal is necessarily close to the passive sonar sensor. Determining when or if a marine animal is within a mitigation zone by passive acoustic detection is not normally technically feasible.

There is no information from which to assess how many, if any, animals not observed by Navy lookouts may or may not have been exposed to MFAS received levels equal to or greater than the exposure criteria set forth by NMFS. However, many of the ESA-listed species in AFTT, with the exception of perhaps the sperm whale, are easier to spot on the surface due to shorter dive times and larger animal size (humpback whale, fin whale, sei whale). Dolphins, the most common cetacean seen in AFTT, often occur in large, visible pods. Beaked whales are difficult to observe at-sea due to deep diving profiles and short surface intervals. Sea turtles are also difficult to observe at-sea due to their size and that they typically swim beneath the ocean surface and have short surface intervals.

(2) AFTT – Sinking Exercises (SINKEX)

No SINKEXs conducted in the AFTT Study Area during the reporting period.

(3) AFTT – Summary of Training Sources Used

This section summarizes total annual usage of each type of sound source used for training within AFTT from 14 November 2019 to 13 November 2020, which constitutes Year 2 of the 7-year authorization.

(i) Total annual hours or quantity of each bin of sonar or other acoustic sources

Table 3-1. Annual Training Acoustic Source Usage within the AFTT Study Area by Source Bin

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov19-13Nov20)	Actual Usage (14Nov19-13Nov20)	% Used of Authorized Amount
(i) Acoustic Sources Used During Annual Training				
LF5	LF sources less than 180 dB	9 hours	*	*
LF6	LF sources greater than 200 dB with long pulse lengths	158 hours	*	*
MF1	Hull-mounted surface ship sonars (e.g. AN/SQS-53/60)	5,262 hours	*	*
MF1K	Kingfisher mode associated with MF1 sonars	117 hours	*	*
MF3	Hull-mounted submarine sonars (e.g. AN/BQQ-10)	2,086 hours	*	*
MF4	Helicopter-deployed dipping sonars (e.g. AN/AQS-22)	599 hours	*	*
MF5	Active acoustic sonobuoys (e.g. DICASS)	6,763 count	*	*
MF10	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned	870 hours	*	*
MF11	Hull-mounted surface ship sonars with an active duty cycle greater than 80%	928 hours	*	*
MF12	Towed array surface ship sonars with an active duty cycle greater than 80%	380 hours	*	*
HF1	Hull-mounted submarine sonars	1,929 hours	*	*

	(e.g. AN/BQQ-10)			
HF3	Other hull-mounted submarine sonars	4,896 hours	*	*
HF4	Mine detection, classification, and neutralization sonar (e.g. AN/SQS-20)	5,960 hours	*	*
HF8	Hull-mounted surface ship sonars (e.g. AN/SQS-61)	20 hours	*	*
ASW1	MF systems operating above 200 dB	607 hours	*	*
ASW2	MF Multistatic Active Coherent sonobuoy (e.g. AN/SSQ-125)	1,510 count	*	*
ASW3	MF towed acoustic countermeasure systems (e.g. AN/SLQ-25)	4,896 hours	*	*
ASW4	MF expendable active acoustic device countermeasures (e.g. MK 3)	428 count	*	*
ASW5	MF sonobuoys with high duty cycles	606 hours	*	*
TORP1	Lightweight torpedo (e.g. MK 46/MK 54)	57 count	*	*
TORP2	Heavyweight torpedo (e.g. MK 48)	80 count	*	*
SAS2	HF SAS systems	4,800 hours	*	*
Pile driving	Pile driving (impact)	238 count	0	0%
Pile removal	Vibratory pile removal	238 count	0	0%

* Information is presented in the classified version of this report.

(ii) Total annual expended/detonated ordnance for each explosive bin

Table 3-2. Annual Training Explosive Source Usage within the AFTT Study Area by Source Bin

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov19-13Nov20)	Actual Usage (14Nov19-13Nov20)	% Used of Authorized Amount
(ii) Explosive Sources Used During Annual Training				
E1	Medium-caliber projectile	7,700 detonations	0	0%
E2	Medium-caliber projectile	212 detonations	0	0%
E3	Large-caliber projectile	4,592 detonations	171	4%
E4	Mine neutralization charge	130 detonations	2	2%
E5	5-inch projectile	1,436 detonations	178	12%
E6	Hellfire missile	602 detonations	24	4%
E7	Demo block / shaped charge	4 detonations	4	100%
E8	Maverick missile	22 detonations	0	0%
E9	500 lb. bomb	66 detonations	62	94%
E10	Harpoon missile / 1000 lb. bomb	90 detonations	23	26%
E11	650 lb. mine	1 detonations	0	0%
E12	2,000 lb. bomb	18 detonations	0	0%

Table 3-3. 7-year Cumulative Training Sound Source Usage within the AFTT Study Area by Source Bin

Sound Source Bin	Year 1 Actual Usage (14Nov18-13Nov19)	Year 2 Actual Usage (14Nov19-13Nov20)	7-yr Authorized Amount (14Nov18-13Nov25)	7-yr Cumulative Actual Usage (14Nov18-13Nov25)	% Used of 7-yr Authorized Amount
(i) Acoustic Sources Used During Annual Training					
LF5	*	*	60	*	*
LF6	*	*	1,104	*	*
MF1	*	*	36,833	*	*
MF1K	*	*	819	*	*
MF3	*	*	14,604	*	*
MF4	*	*	4,196	*	*
MF5	*	*	47,340	*	*
MF10	*	*	6,088	*	*
MF11	*	*	6,495	*	*
MF12	*	*	2,658	*	*
HF1	*	*	13,504	*	*
HF3	*	*	34,275	*	*
HF4	*	*	41,717	*	*
HF8	*	*	140	*	*
ASW1	*	*	4,251	*	*
ASW2	*	*	10,572	*	*
ASW3	*	*	34,275	*	*
ASW4	*	*	2,994	*	*
ASW5	*	*	4,244	*	*
TORP1	*	*	399	*	*
TORP2	*	*	560	*	*
SAS2	*	*	33,600	*	*
Pile driving	76	0	1,666	76	5%
Pile removal	76	0	1,666	76	5%
(ii) Explosive Sources Used During Annual Training					
E1	165	0	53,900	165	1%
E2	0	0	1,486	0	0%
E3	241	171	32,144	412	1%
E4	0	2	913	2	1%
E5	252	178	10,052	430	4%
E6	59	24	4,214	83	2%
E7	0	4	28	4	14%
E8	3	0	154	3	2%
E9	64	62	462	126	27%
E10	62	23	630	85	13%
E11	0	0	7	0	0%
E12	0	0	126	0	0%

* Information is presented in the classified version of this report.

(iii) Special Reporting Areas for Training Active Sonar & In-Water Explosives

Table 3-4. Training Active Sonar & In-Water Explosive Usage within the Northeast North Atlantic Right Whale Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
Active Sonar	All Source Bins	*
In-Water Explosives	All Explosive Bins	0

* Information is presented in the classified version of this report.

Table 3-5. Training Active Sonar & In-Water Explosive Usage within the Gulf of Maine Planning Awareness Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
Active Sonar	All Source Bins	*
In-Water Explosives	All Explosive Bins	0

* Information is presented in the classified version of this report.

Table 3-6. Training Active Sonar & In-Water Explosive Usage within the Southeast North Atlantic Right Whale Mitigation Area (November 15 through April 15)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (15Nov19-15Apr20)
MF1K	Kingfisher mode associated with MF1 sonars	*
In-Water Explosives	All Explosive Bins	0

* Information is presented in the classified version of this report.

Table 3-7. Training Active Sonar & In-Water Explosive Usage within the Southeast North Atlantic Right Whale Critical Habitat Special Reporting Area (November 15 through April 15)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (15Nov19-15Apr20)
MF1K	Kingfisher mode associated with MF1 sonars	*
In-Water Explosives	All Explosive Bins	0

* Information is presented in the classified version of this report.

Table 3-8. Training Active Sonar & In-Water Explosive Usage within the Bryde's Whale Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
Active Sonar	All Source Bins	*
In-Water Explosives	All Explosive Bins	0

* Information is presented in the classified version of this report.

(4) AFTT – Geographic Training Information Presentation

The precise locations and frequency of ASW training is classified. There is currently no method to declassify the sensitivity of this data in order to publish this type of information in an unclassified report. For this reason, the only

available method for this information to be disseminated for the foreseeable future is in the classified version of this Annual Exercise Report.

(5) AFTT – Sonar Exercise Notification

The Navy submitted all required information to NMFS for all MTEs during the reporting period, including location of the exercise, beginning and end dates of the exercise, and type of exercise.

(6) AFTT – Summary of Testing Sources Used

This section summarizes total annual usage of each type of sound source used for testing within AFTT from 14 November 2019 to 13 November 2020, which constitutes Year 2 of the 7-year authorization.

(i) Total annual hours or quantity of each bin of sonar or other acoustic sources

Table 6-1. Annual Testing Acoustic Source Usage within the AFTT Study Area by Source Bin

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov19-13Nov20)	Actual Usage (14Nov19-13Nov20)	% Used of Authorized Amount
(i) Acoustic Sources Used During Annual Testing				
LF3	LF sources greater than 200 dB	1,308 hours	*	*
LF4	LF sources equal to 180 dB and up to 200 dB	971 hours	*	*
LF5	LF sources less than 180 dB	1,752 hours	*	*
LF6	LF sources greater than 200 dB with long pulse lengths	40 hours	*	*
MF1	Hull-mounted surface ship sonars (e.g. AN/SQS-53/60)	3,337 hours	*	*
MF1K	Kingfisher mode associated with MF1 sonars	152 hours	*	*
MF3	Hull-mounted submarine sonars (e.g. AN/BQQ-10)	1,257 hours	*	*
MF4	Helicopter deployed dipping sonars (e.g. AN/AQS-22)	542 hours	*	*
MF5	Active acoustic sonobuoys (e.g. DICASS)	5,523 count	*	*
MF6	Active underwater sound signal devices (e.g. MK 84)	1,284 count	*	*
MF8	Active sources (greater than 200 dB) not otherwise binned	348 hours	*	*
MF9	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	7,447 hours	*	*
MF10	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned	5,690 hours	*	*
MF11	Hull-mounted surface ship sonars with an active duty cycle greater than 80%	1,424 hours	*	*
MF12	Towed array surface ship sonars with an active duty cycle greater than 80%	1,388 hours	*	*
MF14	Oceanographic MF sonar	1,440 hours	*	*
HF1	Hull-mounted submarine sonars (e.g. AN/BQQ-10)	396 hours	*	*
HF3	Other hull-mounted submarine sonars (classified)	31 hours	*	*
HF4	Mine detection, classification, and neutralization sonar (e.g. AN/AQS-20)	25,645 hours	*	*
HF5	Active sources (greater than 200 dB) not otherwise binned	1,946 hours	*	*
HF6	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	2,179 hours	*	*

HF7	Active sources (greater than 160 dB, but less than 180 dB) not otherwise binned	1,224 hours	*	*
HF8	Hull-mounted surface ship sonars (e.g. AN/SQS-61)	2,084 hours	*	*
VHF1	VHF sources greater than 200 dB	12 hours	*	*
ASW1	MF systems operating above 200 dB	820 hours	*	*
ASW2	MF Multistatic Active Coherent sonobuoy (e.g. AN/SSQ-125)	5,120 count	*	*
ASW3	MF towed acoustic countermeasure systems (e.g. AN/SLQ-25)	3,105 hours	*	*
ASW4	MF expendable active acoustic device countermeasures (e.g. MK 3)	3,435 count	*	*
ASW5	MF sonobuoys with high duty cycles	617 hours	*	*
TORP1	Lightweight torpedo (e.g. MK 46/MK 54)	875 count	*	*
TORP2	Heavyweight torpedo (e.g. MK 48)	371 count	*	*
TORP3	Heavyweight torpedo (e.g. MK 48)	91 count	*	*
FLS2	HF sources with short pulse lengths, narrow beam widths, and focused beam patterns	1,224 hours	*	*
M3	MF acoustic modems (greater than 190 dB)	634 hours	*	*
SD1/SD2	HF and VHF sources with short pulse lengths, used for the detection of swimmers and other objects for the purposes of port security	176 hours	*	*
SAS1	MF SAS systems	960 hours	*	*
SAS2	HF SAS systems	3,512 hours	*	*
SAS3	VHF SAS systems	960 hours	*	*
SAS4	MF to HF broadband mine countermeasure sonar	960 hours	*	*
BB1	MF to HF mine countermeasure sonar	960 hours	*	*
BB2	HF to VHF mine countermeasure sonar	960 hours	*	*
BB4	LF to MF oceanographic source	1,555 hours	*	*
BB5	LF to MF oceanographic source	672 hours	*	*
BB6	HF oceanographic source	672 hours	*	*
BB7	LF oceanographic source	120 count	*	*
AG	Small underwater air guns	604 count	0	0%

*Information is presented in the classified version of this report.

(ii) Total annual expended/detonated ordnance for each explosive bin

Table 6-2. Annual Testing Explosive Source Usage within the AFTT Study Area by Source Bin

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Authorized Amount (14Nov19-13Nov20)	Actual Usage (14Nov19-13Nov20)	% Used of Authorized Amount
(ii) Explosive Sources Used During Annual Testing				
E1	Medium-caliber projectile	22,983 detonations	0	0%
E3	Large-caliber projectile	2,880 detonations	101	4%
E4	Mine neutralization charge	761 detonations	0	0%
E5	5-inch projectile	1,325 detonations	0	0%
E6	Hellfire missile	39 detonations	0	0%
E8	Lightweight torpedo	33 detonations	0	0%
E9	500 lb. bomb	4 detonations	0	0%

E10	Harpoon missile	81 detonations	0	0%
E11	650 lb. mine	10 detonations	0	0%
E16[1]	Littoral Combat Ship full ship shock trial	12 detonations	0	0%
E17[1]	Aircraft carrier full ship shock trial	4 detonations	0	0%

[1]Shock trials consist of four explosions each. In any given year there could be 0-3 small ship shock trials (E16) and 0-1 large ship shock trials (E17). Over a 7-year period, there could be three small ship shock trials (E16) and one large ship shock trial (E17).

Table 6-3. 7-year Cumulative Testing Sound Source Usage within the AFTT Study Area by Source Bin

Sound Source Bin	Year 1 Actual Usage (14Nov18-13Nov19)	Year 2 Actual Usage (14Nov19-13Nov20)	7-yr Authorized Amount (14Nov18-13Nov25)	7-yr Cumulative Actual Usage (14Nov18-13Nov25)	% Used of 7-yr Authorized Amount
(i) Acoustic Sources Used During Annual Testing					
LF3	*	*	9,156	*	*
LF4	*	*	6,797	*	*
LF5	*	*	12,264	*	*
LF6	*	*	280	*	*
MF1	*	*	23,358	*	*
MF1K	*	*	1,064	*	*
MF3	*	*	8,799	*	*
MF4	*	*	3,797	*	*
MF5	*	*	38,663	*	*
MF6	*	*	8,986	*	*
MF8	*	*	2,436	*	*
MF9	*	*	52,128	*	*
MF10	*	*	39,830	*	*
MF11	*	*	9,968	*	*
MF12	*	*	9,716	*	*
MF14	*	*	10,080	*	*
HF1	*	*	2,772	*	*
HF3	*	*	215	*	*
HF4	*	*	179,516	*	*
HF5	*	*	13,624	*	*
HF6	*	*	15,254	*	*
HF7	*	*	8,568	*	*
HF8	*	*	14,587	*	*
VHF1	*	*	84	*	*
ASW1	*	*	5,740	*	*
ASW2	*	*	35,842	*	*
ASW3	*	*	21,737	*	*
ASW4	*	*	24,043	*	*
ASW5	*	*	4,316	*	*
TORP1	*	*	6,122	*	*
TORP2	*	*	2,600	*	*

TORP3	*	*	640	*	*
FLS2	*	*	8,568	*	*
M3	*	*	4,436	*	*
SD1/SD2	*	*	1,232	*	*
SAS1	*	*	6,720	*	*
SAS2	*	*	24,584	*	*
SAS3	*	*	6,720	*	*
SAS4	*	*	6,720	*	*
BB1	*	*	6,720	*	*
BB2	*	*	6,720	*	*
BB4	*	*	10,884	*	*
BB5	*	*	4,704	*	*
BB6	*	*	4,704	*	*
BB7	*	*	840	*	*
AG	0	0	4,228	0	0%
(ii) Explosive Sources Used During Annual Testing					
E1	0	0	160,880	0	0%
E3	0	101	20,162	101	<1%
E4	0	0	5,330	0	0%
E5	0	0	9,275	0	0%
E6	0	0	276	0	0%
E8	0	0	231	0	0%
E9	0	0	28	0	0%
E10	0	0	566	0	0%
E11	0	0	70	0	0%
E16[1]	0	0	12	0	0%
E17[1]	0	0	4	0	0%

[1]Shock trials consist of four explosions each. Over a 7-year period, there could be three small ship shock trials (E16) and one large ship shock trial (E17).
*Information is presented in the classified version of this report.

(iii) Special Reporting Areas for Testing Active Sonar & In-Water Explosives

Table 6-4. Testing Active Sonar & In-Water Explosive Usage within the Northeast North Atlantic Right Whale Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
MF9	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	*
In-Water Explosives	All Explosive Bins	0

*Information is presented in the classified version of this report.

Table 6-5. Testing Active Sonar & In-Water Explosive Usage within the Gulf of Maine Planning Awareness Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
MF9	Active sources (equal to 180 dB and up to 200 dB) not otherwise binned	*
In-Water Explosives	All Explosive Bins	0

*Information is presented in the classified version of this report.

Table 6-6. Testing Active Sonar & In-Water Explosive Usage within the Southeast North Atlantic Right Whale Mitigation Area (November 15 through April 15)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (15Nov19-15Apr20)
Active Sonar	All Source Bins	*
In-Water Explosives	All Explosive Bins	0

*Information is presented in the classified version of this report.

Table 6-7. Testing Active Sonar & In-Water Explosive Usage within the Southeast North Atlantic Right Whale Critical Habitat Special Reporting Area (November 15 through April 15)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (15Nov19-15Apr20)
Active Sonar	All Source Bins	*
In-Water Explosives	All Explosive Bins	0

*Information is presented in the classified version of this report.

Table 6-8. Testing Active Sonar & In-Water Explosive Usage within the Bryde's Whale Mitigation Area (year-round)

Authorized sound sources 50 CFR §218.80 (c) and NMFS AFTT LOA		Actual Usage (14Nov19-13Nov20)
HF4	Mine detection, classification, and neutralization sonar (e.g. AN/AQS-20)	*
HF5	Active sources (greater than 200 dB) not otherwise binned	*
In-Water Explosives	All Explosive Bins	0

*Information is presented in the classified version of this report.

(7) AFTT – Geographic Testing Information Presentation

The precise locations and frequency of ASW testing is classified. There is currently no method to declassify the sensitivity of this data in order to publish this type of information in an unclassified report. For this reason, the only available method for this information to be disseminated for the foreseeable future is in the classified version of this Annual Exercise Report.

(8) AFTT – ICE Exercise 2020 Training and Testing Activities

U.S. Navy active sonar use during ICEX 2020 is classified and is presented in the classified version of this report. No sonar shutdowns were required during the exercise.