DEPARTMENT OF THE NAVY
BOARD OF INSPECTION AND SURVEY
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VIRGINIA BEACH, VA 23459-3295

INSURVINST 4730.24B
N01
7 Nov 11

INSURV INSTRUCTION 4730.24B

From: President, Board of Inspection and Survey

Subj: GUN FIRING DEMONSTRATIONS DURING MATERIAL INSPECTIONS (MI), FINAL CONTRACT TRIALS (FCT).

Encl: (1) PHALANX Close-In-Weapons System (CIWS) MK 15 Firing Plan
(2) 25mm MK 38 MOD 1 and 2 Machine Gun Firing Plan
(3) 30mm MK 46 Gun Firing Plan
(4) 57mm MK 110 Gun Firing Plan
(5) 76mm MK 75 Gun Firing Plan
(6) 5-inch MK 45 Gun Firing Plan

1. Purpose. To establish INSURV policy and standards for conducting firing demonstrations on all gun mounts (CIWS, 25MM, 30MM, 57MM, 76MM and 5-Inch). Firing test plans have been designed to verify, as applicable, the proper functioning of interfaces, material condition of equipment, and electrical, mechanical and structural integrity of the gun systems. The demonstrations should not be construed as tactical or training evolutions.

2. Cancellation. INSURVINST 4730.24A.

3. Discussion. This instruction is applicable to ships preparing for and executing Material Inspections (MI), Final Contract Trials (FCT). Utilizing the firing plans listed in enclosures (1) thru (6), ships should schedule the demonstrations to occur during daylight hours and in a designated "hot" operating area. In addition, the gun live fire demonstrations must be coordinated with the Area Defense and/or Self-Defense Detect-to-Engage (DTE) demonstrations such that the gun mounts contain no live ammunition during the DTE events. All safety precautions and pre-fire requirements, including the running of the Protective Measures Assessment Protocol (PMAP), will be adhered to prior to and during the conduct of the demonstrations.

4. Requirements. Each ship is required to conduct the gun live firing demonstrations using applicable enclosures. For all ships, each gun will be fired as an individual event; that is, only one gun will be fired at a time. For any ship that does not have permanently installed 25mm gun mounts (because of a rotatable pool program), the ship is required to have the 25mm gun mount(s) installed in order to conduct the demonstration for the MI or MTIA.

a. After the INSURV arrival conference, the ship will conduct a pre-fire brief with INSURV inspectors in attendance. Emphasis will be focused on safety, procedures, readiness status of Gun Weapon Systems and watch team organization. As applicable, the combination of rounds, loading sequence, and manual target track parameters will be included in the brief. A sample brief template is available on the INSURV website at http://www.public.navy.mil/fltfor/insurv/.

b. Applicable pre-fire checks on the guns and fire control systems must be satisfactorily completed prior to demonstrations and signed checklists will be presented to INSURV inspectors. INSURV must be notified of any deviations from or non-completion of pre-fire requirements during the pre-fire brief.

c. PMS Pre-Action Calibration (PAC) is not required to be completed prior to the demonstrations because the demonstrations are not actual surface target engagements.

d. For ships with 57MM, 76MM or 5-inch guns, ship's force will construct a manual target at a safe range and bearing, ensuring the target course and speed is equal to that of own ship for a parallel target track. Choose the target range appropriately to account for the range limitations of the selected round. Fall of shot spot corrections should be applied as necessary to ensure all rounds fall inside the hot area. Fall of shot and spot corrections will not be evaluated/graded.

5. Outside assistance. OPAREA hot area clearances will be required from the applicable Fleet Area Control and Surveillance Facility (FACSFAC). For FCTs, ships are responsible for TYCOM NCEA augments, if required, to support the applicable firing plan.

6. The ship's Commanding Officer remains completely responsible for the safe conduct of the demonstrations, to include consideration and adherence to environmental laws/regulations

and operational requirements; any concerns should be discussed with the Senior Inspector. At no time will the Commanding Officer's Weapons Safety Posture be compromised. Nothing is more important than safety of equipment and personnel.

//s//
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Phalanx Close-In-Weapons System (CIWS) MK 15

This plan provides a concise live-firing event for determining material readiness of the CIWS Gun Mount. The main benefits of this firing event are: (1) verify operation of Gun and Ammo Handling System with rounds being fired; (2) verify firing solution (for 1B mounts, two firing rates of 3000 and 4500 spm; for all mounts, determine offset angles between track antenna's bore sight and gun's bore sight in train and elevation); (3) verify RCS firing signal to each gun mount.

Rounds to be used: MK 149 MOD 0/1 A675, MOD 2 A676 20MM

Note: The ship will load sufficient rounds to satisfy the PAC Fire requirements, plus 100 rounds per mount to demonstrate firing from RCS.

Procedure:

For BLK 1/1A Mounts

Step 1. Conduct PAC Fire IAW applicable 7112 MIP series.
Step 2. At LCS, enter maintenance code and ensure gun is on safe firing bearing in the hot area and transfer control to RCS.
Step 3. At RCS, verify "Recommend Fire" is received, then fire remaining rounds from RCS.
Step 4. Perform Post-fire checks.

For BLK 1B Mounts

Step 1. Conduct PAC Fire IAW applicable 7112 MIP series.
Step 2. At RCS, change system mode to E/O search, slew mount to firing window, then select Fire Control Bypass. Select engage and verify "Recommend Fire" is displayed.
Step 3. At RCS, conduct Surface engagement and fire remaining rounds.
Step 4. Perform Post-fire checks.

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25MM MK 38 MOD 1 AND 2 MACHINE GUN FIRING PLAN

This plan provides a concise live-firing event for determining material readiness of the 25MM Gun Mount. The main benefits of this firing event are: (1) verify single, burst, and continuous fire modes of operation; (2) verify proper functioning of loading, ammo handling (left and right feed for Mod 2), remote and local firing, and counter-recoil mechanisms; (3) for Mod 2 mounts, verify remote sighting system and safe operation of gun using remote control system. The ISEA concurs with this firing plan.

Rounds to be used: M793, TP-T (Training Practice-Tracer), NALC A976

MK 38 Mod 1 Machine Gun

2 modes of operation:

Single shot (10 rds)
Continuous (45 rds) firing rate 180/min

Procedure:

Step 1. Load 55 rounds of ammo.
Step 2. Select "single-shot" mode and fire ten (10) rounds.
Step 3. Select "Continuous" mode, fire 45 rounds.
Step 4. Perform post fire checks.

MK 38 Mod 2 Machine Gun

3 modes of operation:

Single shot (4 rds)
Burst (16 rds)
Continuous (35 rds)

Procedure:

Step 1. Load ammo: 25 rounds in left feed chute, 30 rounds in right feed chute.
Step 2. At remote console, select Left Feed.
Step 3. From remote console, select "Single-shot" mode and fire

two (2) rounds.

Step 4. From remote console, select "Low Burst" mode and fire three (3) rounds.
Step 5. From remote console, select "High Burst" mode and fire five (5) rounds.
Step 6. From remote console, select "Low Continuous" mode and fire five (5) rounds.
Step 7. From remote console, select "High Continuous" mode and fire ten (10) rounds.
Step 8. At remote console, select Right Feed.
Step 9. From remote console, select "Single-shot" mode and fire two (2) rounds.
Step 10. From remote console, select "Low Burst" mode and fire three (3) rounds.
Step 11. From remote console, select "High Burst" mode and fire five (5) rounds.
Step 12. From remote console, select "Low Continuous" mode and fire five (5) rounds.
Step 13. From remote console, select "High Continuous" mode and fire ten (10) rounds.
Step 14. Switch to Local Control and select "Single-shot" mode and fire one (1) round.
Step 15. In Local Control, select "Continuous" mode and fire four (4) rounds.
Step 16. Perform post-fire checks.

ISEA MK 38 Mod 1/2 Machine Gun

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30MM MK 46 GUN FIRING PLAN

This plan provides a concise live-firing event for determining material readiness of the 30MM Gun Mount. The main benefits of this firing event are: (1) verify single, burst, and continuous fire modes of operation, (2) verify proper functioning of loading, ammo handling (upper and lower feed), remote firing, and counter-recoil mechanisms, (3) verify remote sighting system and safe operation of gun using remote control system. The ISEA concurs with this firing plan.

Rounds to be used: EX239 Mod 0 TP-T (Training Practice - Tracer) NALC AA90, Alternative round: PGU-15B TP.

3 Modes of Operation

Single
5-round Burst
Continuous

Procedure:

Step 1. Load a total of 90 rounds of ammo in upper and lower feed chutes.

Step 2. From remote control station and using upper chute, select "single-shot" mode and fire two (2) rounds.

Step 3. From remote control station and using upper chute, select "burst" mode and fire two (2) salvos of five (5) round bursts.

Step 4. From remote control station and using upper chute, select "continuous" mode and fire remaining 33 rounds.

Step 5. From local control station and using lower chute, select "single-shot" mode and fire two (2) rounds.

Step 6. From local control station and using lower chute, select "burst" mode and fire two (2) salvos of five (5) round bursts.

Step 7. From local console and using lower chute, select "continuous" mode and fire remaining 33 rounds.

Step 8. Perform post-fire checks.

ISEA MK 46 Gun

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57MM MK 110 GUN FIRING PLAN

This plan provides a concise live-firing event for determining material readiness of the 57MM Gun Mount. This firing event optimizes type of ammunition used and loading system operating mode while using a constrained number of rounds. The main benefits of this firing event are: (1) verify the loading sequence; (2) verify the switching functionality of different rounds in the gun; (3) verify fuzed round functionality; (4) verify interfaces with the FCS. The ISEA concurs with this firing plan.

Rounds to be used: 10 rounds total, (6) TP/MK 296 mod 0, (4) 3P (Pre-fragmented, Programmable, Proximity Fuzed)

Modes of Operation

Single-shot mode (2 TP rds for spotting)
Continuous-shot mode (4 TP rds)
Continuous-shot mode with fuse-setter set to Time Function Mode: (4 3P rds)

Note 1: The first of the 3P rounds will always be fired in proximity fuze/point detonation mode because during the loading sequence, the first 3P round is placed past the fuze setter; it therefore can only be shot in its default mode. Once the first 3P round is fired, the 3 subsequent rounds should be fuzed to fire in time function mode and, if the FCS can support, with an airburst.

Procedure:

Step 1. Load ammo. (See note 2 below)
Step 2. Select "single-shot" mode and fire two (2) TP rounds for spotting.
Step 3. Select "continuous-shot" mode and fire four (4) TP rounds.
Step 4. Select "continuous-shot" mode with fuze-setter set to Time Function Mode and fire four (4) 3P rounds.
Step 5. Perform post-fire checks.

Note 2: Load all six TP rounds in one hoist/gun magazine and all four 3P rounds in the other to verify the switching functionality between round types.

ISEA MK 110/MK 75 Guns

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76MM MK 75 GUN FIRING PLAN

This plan provides a concise live-firing event for determining material readiness of the 76MM MK 75 Gun. This firing event optimizes round location and loading system operating mode while using a constrained number of rounds. The main benefits of this firing event are: (1) does not duplicate testing or assessment available by other sources such as MRCs, etc.; and (2) tests performance of the gun mount's mechanical and electric/electronic sub-systems and the effect of shock generated during a live firing exercise. The ISEA concurs with this firing plan.

Procedure:

Step 1. Load 1 round BL&P into the revolving magazine inner ring.
Step 2. Fire 1 round BL&P, remote fire.
Step 3. Cease Fire. Enter gun mount and visually inspect for damage and integrity.
Step 4. Load 2 rounds BL&P into revolving magazine outer ring in consecutive cells.
Step 5. Fire 2 rounds BL&P, remote from MK 92, MAX RATE (Note; pause after firing key is pressed due to loaded rounds cycling through system).
Step 6. Load 3 rounds BL&P into the revolving magazine inner ring in consecutive cells, skip 2 cells, followed by 4 rounds BL&P in consecutive cells of the inner ring.
Step 7. Fire 7 rounds BL&P, remote from MK 92, MAX RATE.
Step 8. **Cease Fire** - Enter gun mount and visually inspect for damage and integrity. Perform MRC for post-firing checks if no additional firing events are scheduled.

ISEA MK 75 76MM GUN

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5-INCH MK 45 GUN MOUNT FIRING PLAN

This plan provides a concise live-firing event for determining material readiness of the 5-inch Gun Mount. This firing event optimizes round location, type of ammunition used, and loading system operating mode while using a constrained number of rounds. The main benefits of this firing event are: (1) doesn't duplicate testing or assessment available by other sources such as MRCs, etc.; (2) accomplishes the preferred "round-in-every-spot" minimum standard; and (4) imposes maximum gun-loading stress by simultaneously using the lower hoist (magazine), lower gun-loading (loader drum) and upper gun-loading (cradle, slide and recoil) at their operating limits while setting and firing fuzed ammunition. The ISEA concurs with this firing plan.

Step 1. Load all cells of the Loader Drum and each level of the Lower Hoist including the Upper and Lower Loading Stations with rounds selected from Tables 1, 2, and 3. Refer to Table 4 for loading sequence and total rounds required. Note that for each gun mount, five rounds must be fuzed rounds (Tables 2 and 3). Of these five fuzed rounds, at least one must be mechanically fuzed (choose from Table 2) and at least one must be electronically fuzed (choose from Table 3). Ships may choose any rounds listed in Tables 1, 2, and 3 that satisfy the above requirements. Ensure fuzed rounds are actually set by the fuzesetter.

Step 2. Select full Remote Mode of operation (Loading, Firing, Train and Elevation).

Step 3. Fire the first two rounds in Single Load operation to verify intended fall of shot.

Step 4. Fire all remaining rounds in Auto-Continuous mode of operation. A slight pause to select a different type round is acceptable.

Step 5. Completion of Step 4 concludes this event. Return gun to normal condition. Perform MRC for post-firing checks if no additional firing events are scheduled.

TABLE 1 - PRACTICE PROJECTILES

Projectile Type	DODIC	Mk/Mod	5/54 Guns Type As:
BL&P	D349	092/01	OTHER/PD
PUFF-IR	DA01	165/00	OTHER/IRNS
NFRAG-IR	DA06	170/00	OTHER/IR
NFRAG-VT	D334	100/01,02	OTHER/VT

TABLE 2 - MECHANICALLY FUZED PROJECTILES

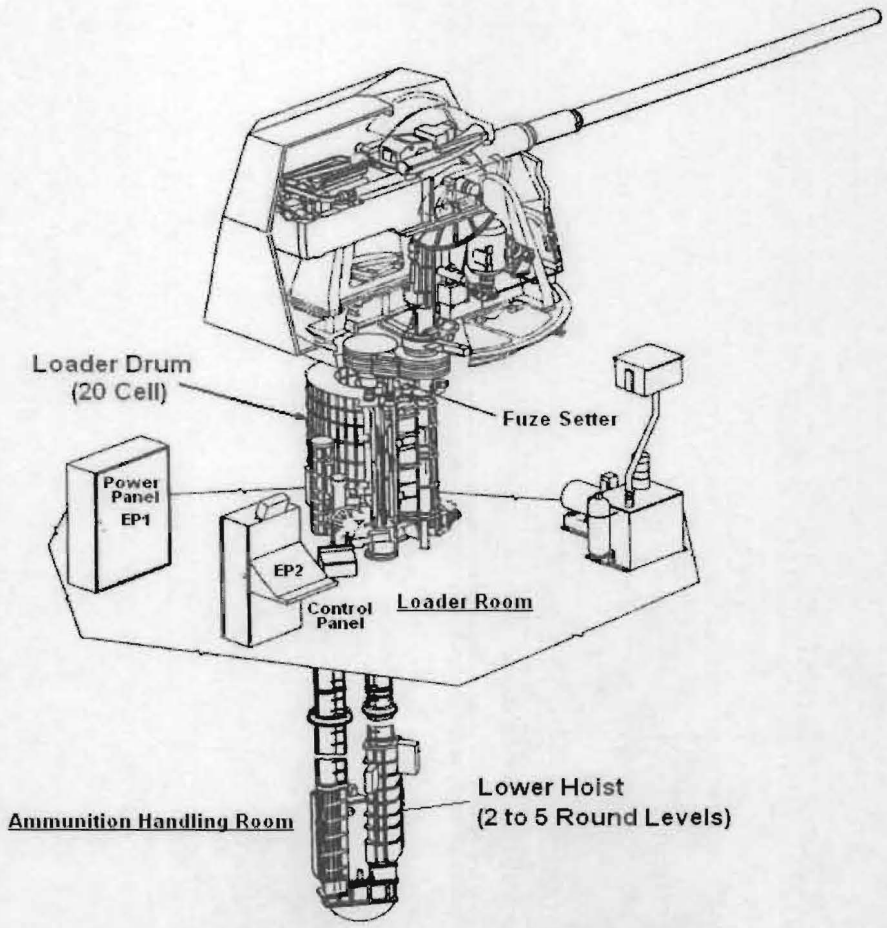
Projectile Type	DODIC	Mk/Mod	5/54 Guns Type As:
HE-CVTNS	D350	157/00,02	OTHER/CVTNS
	D803	158/00	HC/CVTNS
HF-CVTNS	D346	081/00	HF/CVTNS
ILLUM-MT	D353	099/02	SS-2/MT
	D354	091/00	SS/MT
HE-MTNS	D338	173/00	HC/MTNS
HF-MTNS	D340	082/00	HF/MTNS

TABLE 3 - ELECTRONICALLY FUZED PROJECTILES

Projectile Type	DODIC	Mk/Mod	5/54 Guns Type As:
HE-ET	DA34	179/00	HF-ESF
HE-MFF	DA08	174/01	HC-ESF
KE-ET	DA15	182/00	OTHER-ESF

TABLE 4 - AMMUNITION LOADING SEQUENCE

SHIP	MOUNT	ROUNDS				
		LOADER DRUM		LOWER HOIST		TOTAL
		Practice	Fuzed	Practice	Fuzed	
CG	51	19	1	-	4	**24**
	52	17	3	-	2	**22**
DDG	51	20	0	-	5	**25**



5-Inch Mk 45 Gun Mount General Arrangement

5 Inch ISEA

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