US Navy Insensitive Munitions (IM) Munitions Reaction Evaluation Board (MREB)

Ken Tomasello
Insensitive Munitions Office
Naval Ordnance Safety and Security Activity
Indian Head, MD

Heather Hayden, PhD
Naval Surface Warfare Center Indian Head Explosive Ordnance Disposal Technology Division
Indian Head, MD

ABSTRACT

In August 2017, the Naval Ordnance Safety and Security Activity (NOSSA) issued NOSSA Instruction (NOSSAINST 8010.1A, Munitions Reaction Evaluation Board (MREB). This instruction is an update to the original NOSSAINST 8010.1 of July 2009 which created the US Navy unified board for scoring Insensitive Munitions (IM), Hazard Classification (HC) and basic safety tests. The guidance provided by this instruction ensures consistent evaluation of ordnance hazard assessment test plans and scoring technical performance (i.e., test/no-test and reaction level) of hazard testing in support of IM compliance, HC and Weapon System Explosive Safety Review Board (WSESRB) review processes for munitions. NOSSAINST 8010.1A clarifies and updates the operating philosophy of the MREB including: Leadership, Membership, Meetings, Authority and Responsibility, and Documentation for the Board. This paper describes the background of formation of the unified US Navy board, reviews the applicability of the instruction and provides highlights from the instruction.

INTRODUCTION

OBJECTIVE

The objective of this paper is to inform the international Insensitive Munitions (IM) and Munitions Safety communities on the US Navy Munitions Reaction Evaluation Board's (MREB) mission, authority, responsibility, and membership. The MREB's mission is:

(1) provide guidance and recommendations for the proper design and conduct of ordnance hazard assessment testing
(2) provide evaluation of ordnance hazard assessment test plans
(3) provide scoring of technical performance (i.e., test/no-test and reaction level) of hazard testing in support of Insensitive Munitions (IM) compliance, Hazard Classification (HC), and Weapon Systems Explosives Safety Review Board (WSESRB) review processes for munitions.

BACKGROUND

Since the implementation of the IM policy by the Chief of Naval Operations (CNO) in 1984, IM issues have received increasing attention within the Department of Defense (DoD). As an example, in 2006, the Joint Requirements Oversight Council (JROC) established Standardized IM tests and then in 2010 The Office of the Secretary of Defense (OSD) established the Joint US IM test standards and passing criteria. The Joint US IM test standards are based on the NATO AOP-39, Ed.2 policy document which provides the guidance on IM and HC assessment and testing. In its execution of IM policy and procedures, OSD continues to strive to harmonize IM and HC test requirements. Weapons system programs are frequently Joint Service programs or the weapons are operating in a Joint Warfighter Environment. Therefore, Joint safety requirements are becoming more important to implement and evaluate. With the increased levels of Joint oversight, it is imperative that the DON has one single authority for the review of weapons systems test plans and results for compliance with safety, IM, and HC requirements. Standardized criteria must be applied to munitions reactions during internal reviews prior to presentations to external review boards. In 2008 a decision was made by NOSSA that the three Navy scoring boards would be consolidated into one board. A new Navy Instruction NOSSAINST 8010.1 established policy that brought together the Ordnance Hazards Explosive Board (OHEB- NAWCWD China Lake), the Insensitive Munitions Board (IMB – NSWC Dahlgren) and the Insensitive Munitions Board (IMB – NSWC Crane) to form the MREB. The instruction was finalized in late 2009 and the MREB officially began operating in January 2010. The board has operated effectively since its inception. The MREB board members are

comprised of Subject Matter Experts (SME) from IM, HC and basic safety testing. The MREB has provided the board members an environment to learn from the strengths of the members from each of the three sites. A recent update to the instruction was made in 2017 which clearly reflects how the board currently operates. This paper reflects the most current revision of the instruction.

MREB PHILOSOPHY

The MREB convenes either in person or by video/web/teleconference at a DON Warfare Center. The Lead Chairperson will coordinate the meeting time and location with the MREB Site Chairperson's and voting members. Attendance by the full membership at every meeting is encouraged, either in person (if required) or by video/web/teleconference, so that judgments are consistently rendered independent of the meeting location, program, sponsor, or test activity.

Leadership

The Leadership of the MREB consists of a Lead Chairperson, Site chairperson and Vice chairperson described as follows:

Lead Chairperson: A Lead Chairperson shall be nominated from the current Site Chairpersons by the DON Warfare Center appropriate Department/Director Head and concurred with by the Naval Ordnance Safety and Security Activity (NOSSA). The Lead Chairperson will provide overall direction for the MREB. This position will rotate among the sites every two years.

Site Chairperson: Each DON Warfare Center location will have a Site Chairperson nominated by their appropriate Department/Director Head and concurred with by NOSSA.

Vice Chairperson: A Vice Chairperson will be selected by each Site Chairperson and will act as an Alternate Chairperson if the Lead Chairperson cannot attend.

Membership

The MREB membership is defined as follows:

Voting Members: Membership of the MREB shall include individuals with expertise related to munitions development, IM requirements, HC requirements, ordnance technology, and test and evaluation technologies and methods. Potential members will be nominated in writing by their parent organization to NOSSA for approval.

Executive Secretary: Executive Secretaries will be appointed by the Lead Chairperson to coordinate MREB meetings at their respective location. The Executive

Secretary will also be responsible for meeting minutes, summarizing the Board's findings, summarizing and distributing MREB comments on test plans to NOSSA, and distributing the minutes and findings for review and approval.

Ad Hoc Members can be voting or non-voting as follows:

Voting Members: The MREB can appoint technical specialists, special appointees, as ad hoc voting members to advise the board with unique cases.

Non-voting Members:

(a) The Site Chairperson can appoint technical specialists as ad hoc members for the consideration of unique cases.

(b) NOSSA and/or PEOs/PMs may be ad hoc non-voting members as necessary.

Meetings

The MREB meetings are conducted as required and typically once per month. The MREB maintains records of all of the meetings. Meetings are only called when a quorum is present. Although consensus is preferred, rulings can be made on a two-thirds majority. If a two-thirds majority does not exist for a ruling, then the Site Chairperson will assign representatives to write majority and minority opinions. The Site Chairpersons will review the test data and opinions and provide a recommendation to the Lead Chairperson, who will issue a final ruling.

The following conditions must be met for a quorum to exist:

(a) At least six members are present

(b) The goal is to have representation from each site; however this requirement may be waived upon agreement of the Site Chairpersons.

(c) A site Chairperson or Vice Chairperson is present.

Program Offices will arrange meetings with the appropriate Chairperson and Executive Secretary. Each Site Chairperson will schedule meetings as required. The Executive Secretary will notify all members preferably at least four weeks before a meeting is held on a particular topic, and will instruct the Program Offices where to send test data. Test data for review must be received by the membership preferably at least ten working days before the meeting is held.

Authority and Responsibility

Weapons Program Offices submit their Point of Contact (POC) and detailed test plans, to include a full detailed description of the test item configuration(s) and test method(s), on the NOSSA Web Site via the NOSSA Test Plan Submission Tool. The

detailed test plan will be in concert with the NOSSA Weapons Assessment Directorate (NOSSA N8) approved Threat Hazard Assessments (THA), if applicable, and the System Safety Program Plan. If the test is for an official score and not for developmental purposes, it is important that the program receive concurrence on the detailed test plan from NOSSA N8 before testing may proceed. It is also recommended that even the plans for developmental tests be reviewed prior to each test or test series. If the test plan includes harmonized IM and HC tests, a DoD Explosives Safety Board (DDESB) concurrence may be necessary for those tests being used for HC. DDESB concurrence would be required if the test plan deviates from TB 700-2. In these cases, the tests for HC shall not proceed until the DDESB concurrence is received.

Weapons Program Offices must submit test results to MREB for review in order to obtain an assessment of official score. For engineering assessments, it is not necessary for Weapons Program Offices to submit test results to MREB for review. However, where appropriate, Weapons Program Offices may submit test assessments with IM scores based on engineering analysis of engineering level tests, modeling, comparison to like items, etc., to obtain official assessments.

MREB Responsibilities as follows:

(1) Will provide a response to the Program Office within 30 days of receiving the detailed test plan, test results and test assessments.
(2) Will provide recommendation for approval of test plans to be sent to NOSSA, which will coordinate as necessary within NOSSA for final approval.
(3) Will evaluate the results of ordnance hazards assessment tests including both IM and Basic Safety Tests in accordance with MIL-STD-2105D and provide an official assessment of record of the reactions.
(4) Will report its findings/recommendations and corroborating information, within 15 working days, to NOSSA N8, who will obtain official NOSSA concurrence before sending to requesting Program Office. Gross safety anomalies will be reported immediately.

NOSSA Responsibilities as follows:

(1) Will provide concurrence on the appointments of Lead Chairpersons and Site Chairpersons.
(2) Will render a decision on final approval with MREB recommendation for approval of test plans and findings/ recommendations within 10 business days of receipt. If NOSSA does not approve the test plan or findings/recommendations, the reason(s) will be provided to the MREB.
(3) Will provide the detailed procedures for obtaining approval of test plans and for presenting test results to the Board.

(4) Will publish an MREB Process Guide and Reporting Format.
(5) Will provide test plan submittal guidelines.

Documentation:

NOSSA (N8) will agree on and promulgate a common format for test plans, presentations to the Board, and Board findings. The Chairpersons and NOSSA will ensure that all records are accounted for and accessible by current and future programs.

CONCLUDING REMARKS

NOSSA has created an updated NOSSA Instruction which clearly defines the duties and responsibilities of the US Navy MREB. The MREB scores IM, HC and basic safety tests that ensures consistent evaluation of ordnance hazard assessment test plans and scoring technical performance (i.e., test/no-test and reaction level) of hazard testing. The MREB supports IM compliance, HC and Weapon System Explosive Safety Review Board (WSESRB) review processes for munitions in accordance with the current NATO and US standardized tests.

As the US/NATO IM/HC/basic safety tests, procedures and requirements evolve, NOSSA will continue to maintain/update the MREB instruction.

The US Navy's MREB instruction is a proven model of cooperation and consistency for a unified board for scoring IM, Hazard Classification (HC) and basic safety tests.

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REFERENCES

1. MIL-STD-2105D, **Military Standard, Hazard Assessment Tests for Non-Nuclear Munitions**, 30 October 2013.
2. NAVSEAINST 8010.5C, **Insensitive Munitions Program Planning and Execution**, 15 September 2015.
3. TB 700-2/NAVSEAINST 8020.8B/TO 11A-1-47/DLAR 8220.1, Joint Technical Bulletin, **Department of Defense Ammunition and Explosives Hazard Classification Procedures**, 5 January 1998.
4. JROCM 235-06 **Insensitive Munitions Standards and Passing Criteria**, 6 November 2006
5. NATO AOP-39, Ed 2, **Guidance on the Assessment and Development of Insensitive Munitions (IM)**, March 2010.
6. OUSD Memorandum, Subject: **Joint Insensitive Munitions Test Standards and Compliance Assessment**, 1 February 2010.
7. JROCM 102-05, **Safe Weapons in Joint Warfighting Environments**, 20 May 2005

APPENDIX

APPLICABLE SPECIFICATIONS AND STANDARDS

MIL-STD-2105D	Hazard Assessment Tests for Non-Nuclear Munitions, 19 April 2011.
TB700-2	Joint Technical Bulletin, Department of Defense Ammunition and Explosives Hazard Classification Procedures, 5 January 1998.
NATO STANAG 4439	Policy for Introduction, Assessment and Testing for Insensitive Munitions (MURAT), Edition 3. 17 March 2010.
NATO STANAG 4240	Liquid Fuel/External Fire, Munition Test Procedures, Edition 2. 15 April 2003.
NATO STANAG 4382	Slow Heating Munitions Test Procedures, Edition 2. 15 April 2003.
NATO STANAG 4241	Bullet Impact, Munition Test Procedures, Edition 2. 15 April 2003.
NATO STANAG 4496	Fragment Impact Munitions Test Procedure, Edition 1, 13 December 2006.
NATO STANAG 4396	Sympathetic Reaction Munition Test Procedures, Edition 2. 15 April 2003.
NATO STANAG 4526	Shaped Charge Jet, Munitions Test Procedure, Edition 2, 10 December 2004
NATO STANAG 4375	Safety Drop Munition Test Procedure, Edition 3. 15 June 2010.
NAVSEAINST8020.8C	Department of Defense Ammunition and Explosives Hazard Classification Procedures, 30 July 2012.

NAVSEAINST 8010.5C	Insensitive Munitions Program Planning and Execution, 15 September 2015.