

DEPARTMENT OF DEFENSE EXPLOSIVES SAFETY BOARD



Explosives Safety and Munitions Risk Management

Compelling Past, Active Present, Uncertain Future

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Abstract

Explosives Safety and Munitions Risk Management - Compelling Past, Active Present, Uncertain Future examines explosives safety challenges experienced during high-tempo operational environments in Afghanistan. The paper describes national and NATO hurdles to effectively integrating Explosives Safety and Munitions Risk Management (ESMRM) into NATO defense planning, training, and operations. This paper examines national and NATO responses and actions to institutionalize long-term ESMRM solutions and concludes by providing a comprehensive ESMRM strategy. The ESMRM strategy weaves together previous and existing actions and adds an important element that once implemented will help institutionalize ESMRM throughout NATO with the aim of preventing catastrophic munitions-related accidents during multi-national exercises and operations.

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1. OVERVIEW

Explosives Safety and Munitions Risk Management - Compelling Past, Active Present, Uncertain Future examines explosives safety challenges experienced during high-tempo operational environments in Afghanistan. The paper describes national and NATO hurdles to effectively integrating Explosives Safety and Munitions Risk Management (ESMRM) into NATO defense planning, training, and operations. This paper examines national and NATO responses and actions to institutionalize long-term ESMRM solutions and concludes by providing a comprehensive ESMRM strategy. The ESMRM strategy weaves together previous and existing actions and adds an important element that once implemented will help institutionalize ESMRM throughout NATO with the aim of preventing catastrophic munitions-related accidents during multi-national exercises and operations.

2. EXPLOSIVES SAFETY AND MUNITIONS RISK MANAGEMENT (ESMRM) DEFINED AND ITS RELATION TO THE NATO LOGISTICS PROCESS

ESMRM is a systematic approach that integrates risk analysis into NATO operational planning, military training exercises, and operations.¹ The ESMRM process identifies potentially adverse risks and consequences from munitions and munitions-related processes as part of NATO planning and during exercises, and operations. Figure 1 illustrates the applicability of ESMRM to the NATO consumer logistics process. ESMRM applies to all phases of the NATO consumer logistics process identified in ALP-4.2(A) *Land Forces Logistics Doctrine* to include:

1. Reception Onward Movement and Integration
2. Storage
3. Transportation
4. Distribution
5. Maintenance and Handling
6. Retrograde
7. Demilitarization and Disposal

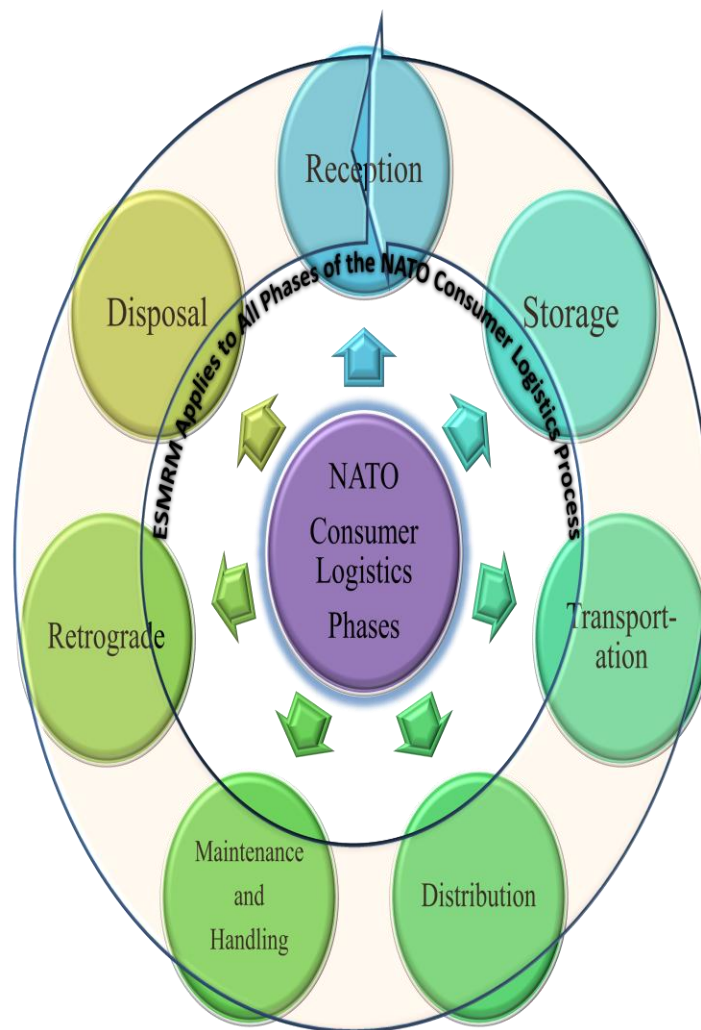


Figure 1. Arrows Depicting ESMRM Applicability to All Phases of the NATO Consumer Logistics Process

3. PROBLEM STATEMENT

Although NATO technical explosives safety policy and guidelines have existed and been ratified by many nations for years, the lack of ESMRM policy, implementing instruction and clear processes linking existing technical requirements to the NATO operational, planning, and logistics communities adversely affected the NATO mission. The lack of governing NATO policy, doctrine, and processes caused significant risk during high-tempo operational environments in Afghanistan meant that in most cases when munitions were involved, NATO leadership unknowingly assumed potentially mission-crippling risk.² Left unaddressed, similar risks are likely to take place in current and future operations.

4. CHALLENGES

4.1 Operational Challenges in Afghanistan. Over a decade of NATO coalition operations in Afghanistan involving military munitions demonstrated that established NATO explosives safety requirements did not effectively support NATO Commanders or the mission during planning, training, and operations. Several audits³ conducted between 2002-2010 in Afghanistan revealed that the deployment of numerous overlapping multi-national forces in close proximity operating under different ammunition safety standards contributed to increased levels of munition-related risks and potential accidents.⁴

4.2 International Security Assistance Force (ISAF) Afghanistan Explosives Safety – Staff Assistance Visit. In 2008, the ISAF Afghanistan Staff requested an assessment to determine compliance with applicable NATO explosives safety storage and movement standards at Kabul International Airport and Kandahar Airfield and make recommendations to address any problems identified. The 2009 ISAF Explosives Safety Staff Assistance Visit - Final Report⁵ concluded that most member nations' staffs were unaware of existing NATO Allied Ammunition Storage and Transportation Publication (AASTP) requirements. The report recommended,

*...the promulgation of clear guidance from NATO on the use of common ammunition and explosives safety standards by all member nations involved in NATO/Coalition/ISAF operations...*⁶

In total, the report identified six areas⁷ requiring action to address explosives safety issues in Afghanistan. Taken as a whole, these areas comprise essential elements of an explosives safety program within NATO.

The ISAF Report⁸ concluded that the six recommendations if implemented, could improve NATO's overall management of explosives safety during operations. Further, the Report addressed the importance of AC/326 in the explosives safety technical area and emphasized that

*Allied Command Operations must strive to connect with (AC/326), to ensure priority issues with the STANAGs in support of operations are fully addressed.*⁹

One significant root-cause for the lack of explosives safety integration within NATO that was neither addressed in the discussion nor the recommendations sections was the NATO operational chain of command's responsibilities as part of the risk-decision process. The general lack of existing munitions-risk awareness within the operational chain of command in NATO directly resulted in increased munitions-related risks to the NATO mission, personnel, equipment, and infrastructure. Further, this lack of awareness also contributed to unidentified munitions-related risks to surrounding host-nation personnel and infrastructure.

4.3 Arguments Against Multi-National Explosives Safety and Munitions Risk Management. Since taking action starting in 2010 to integrate ESMRM into U.S. and NATO requirements, some have argued that ESMRM requirements are not necessary. Arguments against developing and implementing ESMRM requirements are typically based on two

perceptions. First, that munitions support is a national responsibility and second that munitions are just another class of supply.

Misperception #1 – “Ammunition Management is a National Responsibility Therefore Managing Munitions-Related Risks are a National Responsibility as Well.” Although supplying munitions to a military force is usually a national responsibility, identifying and reducing the exposure to the munitions-related risks is a shared responsibility by all nations participating in multi-national operations due to the proximity of forces to munitions. The rationale is straightforward, during transport, maintenance and handling, storage, distribution, retrograde, and destroying unserviceable munitions, the proximity in which forces operate and conduct daily business creates the potential to render another nation’s forces mission incapable in the event of a munitions accident. Additionally, when two or more nations operate together in limited space, conflicts of interest based on mission requirements are likely to arise thereby necessitating an unbiased yet informed decision-making authority.

Misperception #2 – “Ammunition is Just Another Class of Supply.” The NATO Logistics Handbook states that munitions are part of the supply system (Class V). Yet, unlike any other class of supply, munitions are both an asset and a liability. The asset aspect is intuitive; it provides a critical combat capability. However, munitions can also be a liability as they have the potential to:

- Instantly degrade and possibly decimate mission capability.
- Damage or destroy supporting and surrounding infrastructure.
- Kill or injure force and host nation personnel.
- Cause damage to or the loss of materiel.

In comparison to other classes of supply it would appear to the uninformed that munitions have similar risks to fuels and lubricants (Class III). Historical evidence proves beyond doubt that the results of munitions accidents are far more severe than fuel fires and therefore munitions warrant additional planning, risk-identification and mitigation measures, as well as a process for making risk decisions.

4.4 Organizational and Communication Gaps within NATO Limiting the Interface Between Operational and Explosives Safety Professionals. Experience has shown that when the right groups of people with the right attitude are involved, creative and clever solutions often emerge. Analysis revealed that that the Ammunition Safety Group (CASG AC/326) was responsible for developing and maintaining explosives safety NATO Standardization Agreements (STANAG) and other technical documents within NATO. The CASG AC/326 is part of the Conference of Armaments Directors (CNAD). Although CASG AC/326 produced meaningful technical documents, the fact that the Group resided within a primarily acquisition-focused organization meant that meaningful lines of communication with other important NATO organizations were non-existent or limited at best.

Figure 2 illustrates the organizational challenges that the CASG AC/326 faced. NATO’s organizational “cylinders of excellence” or stovepipes, significantly contributed to the communication gaps that prevented the holistic integration of explosives safety across the NATO enterprise. Initial attempts to communicate with and engage personnel within the NATO organizations with munitions-risk equities often proved fruitless. Only after persistent attempts and meeting with General and Flag officers and their civilian senior executive counterparts within SHAPE, AC/305, and ACT were inroads made.

Between 2010 and 2014, over 30 senior leaders were briefed about the lack of ESMRM integration in planning, training, and during operations and the proposed way-ahead to resolve the gaps. Of those leaders, only one did not believe the effort worthwhile.

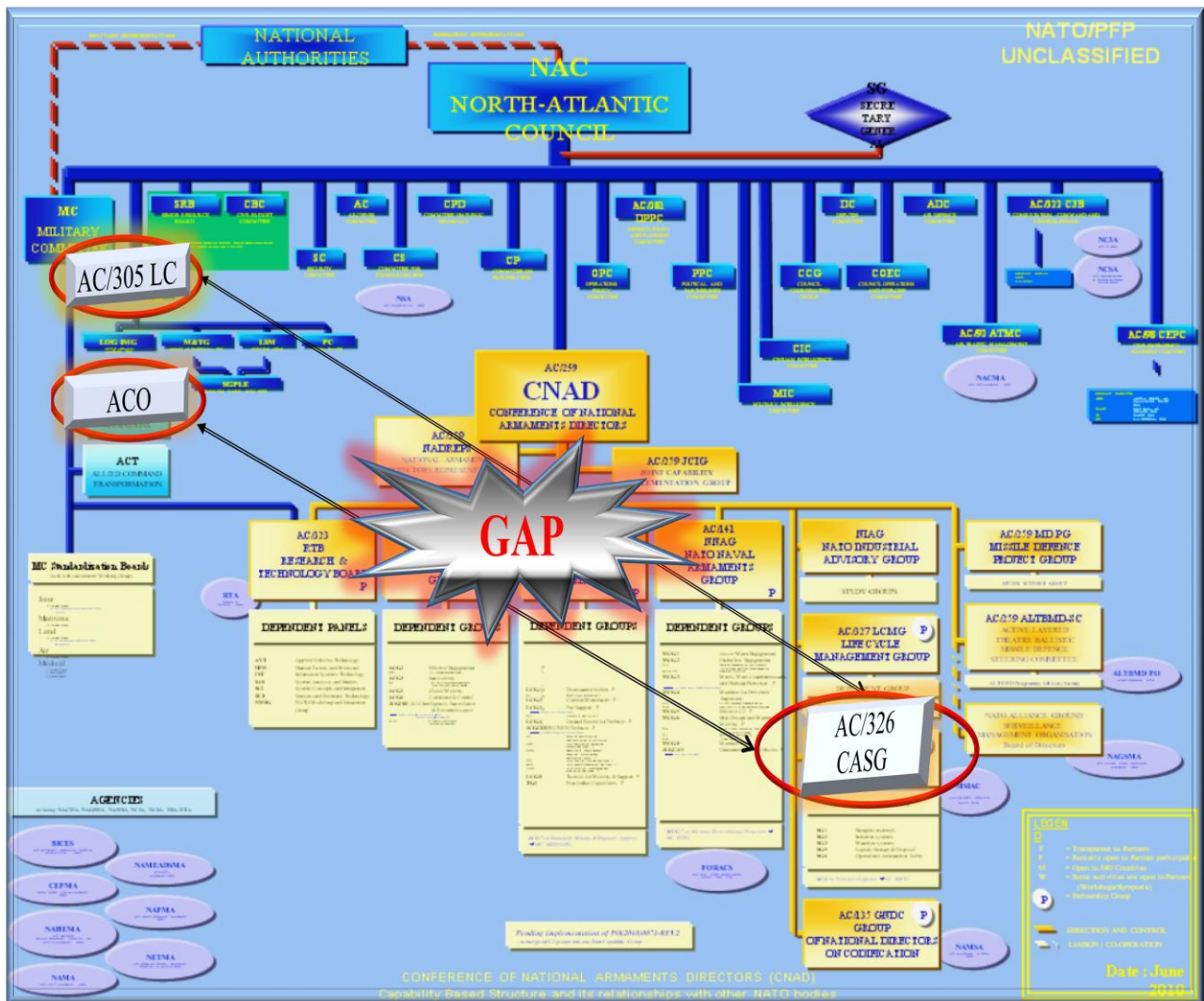


Figure 2. Gap between AC/305 Logistics Committee, Allied Command Operations, and CNAD Ammunition Safety Group AC/326

5. FOUR MISSING KEY ELEMENTS IN NATO POLICY AND DOCTRINE. Although NATO nations, through the Conference for National Armaments Directors (CNAD) Ammunition Safety Group (CASG) AC/326, developed and maintain technical explosives safety requirements in AASTPs -1¹⁰ and -5¹¹, the absence of four key elements in NATO planning, operational, and logistics policy, or doctrine hampered their use in operations when it mattered most. Figure 3 illustrates critical missing elements within NATO policy and doctrine. The four specific missing elements were the:

1. Absence of a clearly defined NATO chain of command within operational channels responsible for munitions-related risk decisions.
2. Lack of a defined deviation process from existing national or NATO explosives safety requirements.¹²
3. Lack of a defined munitions risk-assessment process.¹³
4. Missing links to NATO planning and logistics policy, doctrine, and processes.¹⁴

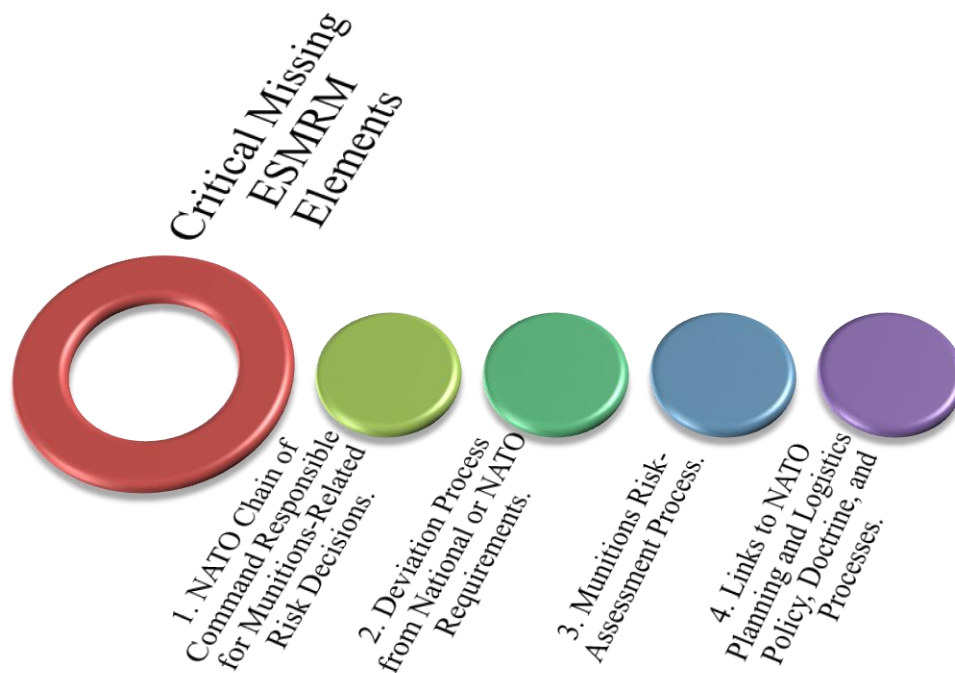


Figure 3. Critical Missing Elements Increasing Chance of Major Munitions-Related Accident

One likely root-cause that the key elements may be missing was the lack of qualified explosives safety personnel within the NATO operational command structure (i.e., Supreme Headquarters Allied Powers Europe (SHAPE), Logistics Committee (LC), Military Committee (MC), and Allied Command Transformation (ACT)).

6. IMPORTANT ORGANIZATIONS, EVENTS, AND DEVELOPMENTS LEADING TO ESMRM SUPPORT IN THE U.S. AND NATO

6.1 U.S. DoD Explosives Safety Board Seminar, Portland Oregon, July 2010.

During the July 2010 U.S. DoD Explosives Safety Board's Seminar in Portland Oregon, Major General (MGen) Ian Poulter shared the Canadian Armed Forces (CAF) operational experiences in Afghanistan with over 600 attendees during his keynote speech. MGen Poulter's speech¹⁵ centered on five lessons learned based on extensive NATO and multi-national operational experiences in the austere and challenging conditions in Afghanistan. These lessons learned were:

1. Incorporating explosives safety in the operational planning process.
2. Having processes in place for ammunition interchangeability between nations to enhance interoperability.
3. Applying appropriate safety regulations for storing munitions in theatre.
4. Ensuring the safety and suitability of ammunition in extreme environmental conditions.
5. Who is in charge of explosives safety in theatre?

MGen Poulter observed that

*while NATO explosives safety regulations were typically followed during peacetime, these regulations were not followed during operations.*¹⁶

The keynote speech concluded with MGen Poulter recommending that the NATO planning process include explosives safety tenets and requirements and that the NATO chain of command actively engage in munitions risk decisions.

Following the keynote address, national AC/326 CASG representatives (Mr. Curtis Bowling (U.S.), Chairman DoD Explosives Safety Board, Mr. Fred Edwards (U.K.), Chief Inspector Explosives United Kingdom Ministry of Defence, Mr. Patrick Lamy (FRA) AC/326 President, Head of Munition Safety Office DGA/IPE, Mr. Andre Pelchat (CAN), Director Ammunition and Explosives Regulation (DAER), AIR CMDRE Bill Hayden (AUS), Director General Explosive Ordnance Department of Defence) held an impromptu meeting to discuss a way ahead to integrate explosives safety requirements more effectively within NATO. All representatives

concurrent with the need to take actions to integrate explosives safety into NATO writ large. Therefore, the only remaining question, and a rather large and daunting one, was how to do so.

Until then (2010), explosives and ammunition safety International Security Assistance Force – Afghanistan (ISAF) and national reports, assessments, and audits had not had the long-term impact hoped for by the nations. Additionally, several AC/326 representatives had previously engaged other parties within national and NATO organizations with little or no success.¹⁷ During the course of the Portland discussions, the U.S., specifically the DDESB staff, volunteered to explore avenues for integrating explosives safety into the NATO enterprise by engaging key leadership. The group agreed and asked for an update on discoveries and recommendations during follow-on AC/326 Main Group meetings at NATO HQ in Brussels.

6.2 Identifying Key Organizations in the U.S. and NATO, the U.S. Joint Chiefs of Staff J7 and J4, NATO Allied Command Transformation, Allied Joint Doctrine. Between August and December 2010, the DDESB actively engaged both the U.S. Chairman of the Joint Chiefs of Staff and NATO ACT representatives to communicate the U.S. and multi-national explosives safety problem faced in Afghanistan. Within the U.S. lines of authority, it quickly became apparent that the U.S. Chairman of the Joint Chiefs of Staff (JCS) J7 (Joint Education and Doctrine Division) and J4 (Supply Division (Ammunition Branch), the Vice J4, and the Director of the J4) played significant roles in both the U.S. and NATO doctrine and logistics arenas.

The JCS J7 supported the ESMRM initiative and requested analysis within the U.S. Joint Doctrine Planning Community¹⁸ as well as through the NATO Allied Command Transformation.¹⁹ These groups' analysis were requested to determine if new explosives safety doctrine was required in the U.S. and NATO respectively and where such guidance would best serve the operational, logistics, planning, and explosives safety communities.

Although the JCS J7 role proved instrumental in educating the DDESB, recommending a course of action, and initiating NATO doctrinal reviews, the JCS J4 role was more significant since the J4 is the senior logistician in the U.S. Department of Defense and the U.S. and the Head of Delegation to the NATO Logistics Committee (LC). As the Director of the J4, Lieutenant General (LTG) Kathleen Gainey agreed to sponsor a U.S. JCS Instruction on Explosives Safety and Munitions Risk Management²⁰ (ESMRM) as well as identify the lack of ESMRM integration to the NATO LC. Without the J4's support, ESMRM would have continued to flounder and the issues identified in Afghanistan would not likely have had the results achieved to date.

Furthermore, parallel efforts by other members of CASG AC/326 also contributed to informing Allied J4 support. A Canadian representative briefed the Quadrilateral Logistics Forum (U.K., U.S., CAN, AUS) on 24 Feb 11. The Canadian briefing generated additional awareness about the lack of policy, doctrine, and consistent process throughout NATO for munitions-risk management and contributed to support by those Nations at the LC. An additional outcome of the Canadian brief was that Major General Mason indicated that he would write a letter supporting the ESMRM initiative. The U.K. letter addressed in detail below was supported by Canada, the U.S. and the U.K. senior logistics leadership and proved instrumental in the LC

AC/305 supporting the ESMRM initiative.

6.3 U.K. – 2011 “Letter Ammunition Safety on Deployed Operations”. Bringing additional attention and emphasis to the emerging explosives safety issue, in January 2011 Major General Mason, (U.K.) Assistant Chief of Defence for Logistics Operations sent a letter to the NATO Logistics Committee leadership titled, “Ammunition Safety on Deployed Operations.”²¹ In his letter the U.K. representative to AC/326, Major General Mason expresses the

...overall sense of unease (in terms of munitions safety in Afghanistan) ...due to the lack of common coalition standards, which is placing U.K. assets at risk from other nations’ activities.

Major General Mason’s letter concludes by requesting the LC’s assistance to harmonize multi-national procedures to preclude what he believes could be *a catastrophic event resulting in loss of life and operational capability.*²²

6.4 AC/326 CASG Statement on Explosives Safety and Ammunition Risk Management. In May 2011, Mr. Patrick Lamy the Chairman of the AC/326 CASG sent a letter²³ to the ACT Bi-SC LCB Chair and MCLSB/I-Ammo Working Group (WG) Chairs. In this letter Mr. Lamy reiterated the concern that

NATO Allies have identified that the lack of explosives safety and munition risk management requirements in NATO policy and doctrine is causing significant munition-related risks in current operations and contingencies. Often times, these risks are neither identified, nor communicated to the appropriate level of leadership for risk and consequences acceptance. Subsequently, risk reduction solutions are not implemented, thereby, increasing the risks and potential consequences to the mission.

Mr. Lamy went on to say that

CASG and participating Nations have expressed this concern to the Military and Logistics Committees, and to ACO. Consequently, the development of a doctrine aiming at supporting the NATO Forces’ Commanders to accomplish the mission safely with a minimal exposure to damaging consequences posed by our own ammunition, be it from an accidental initiation or from enemy fire, becomes a priority.

7. U.S. AND NATO RESPONSE TO GROWING MULTI-NATIONAL EXPLOSIVES SAFETY CONCERNS

7.1 NATO Response – Logistics Committee Requests U.S. DoD Explosives Safety Board Analyze NATO Doctrine for Munitions Risk Management Gaps. As the result of multi-national interest, the NATO LC took steps to address and resolve the explosives safety

problems identified by the U.S., CA, and the U.K. Specifically during the March 2011 LC meeting, the committee,

*invited the U.S. DDESB to conduct a gap analysis of NATO operational policy and doctrine within one year and recommend changes as required.*²⁴

Additionally in March 2011, the LC responded to Major General Mason's January 2011 letter and expressed interest in improving logistics doctrine and supported the development of new doctrine.²⁵

7.2 The Significance of Senior Leadership Support. Although perhaps seemingly routine and administrative in nature, the significance of the explosives safety issues reaching senior national and NATO leadership cannot be overstated. Rather, any future successes that lead to integrating ESMRM into the U.S. and NATO planning, training, and operational doctrine and processes should in part be attributed to senior leadership's willingness to support and actively engage toward a meaningful, long-term solution.

7.3 NATO Gap Analysis - Results. Soon after the March 2011 NATO LC request for the DDESB, work began on an ESMRM Gap Analysis similar to the 2010 U.S. ESMRM Gap Analysis.²⁶ In February 2012, the DDESB provided its findings and recommendations to the Logistics Committee Executive Group in Standardization Format (LCEG-(S)). The DDESB's NATO Gap Analysis²⁷ concluded that gaps existed in 12 of the 16 NATO logistics documents analyzed and recommended three actions to close the gap. Specific recommendations to the LC included:

1. Develop and promulgate a NATO ESMRM policy.²⁸ One of the policy's main objectives, to cover situations when ESMRM would be applicable.
2. Develop an ESMRM-specific Allied Logistics Publication (ALP).
3. Close gaps in existing LC documents by referencing the ESMRM ALP once complete.

The recurring theme that arose from the U.S., U.K., and Canadian reports as well as the follow-on U.K. correspondence to the LC was the clear lack of communication between operational personnel and those responsible for harmonizing NATO requirements. Any hopes of future success were based on the vision that operational, planning, as well as explosives safety personnel needed to actively participate in ESMRM policy and doctrine development since the gap existed due largely to the lack of communication, policy, and repeatable processes between these groups. Figure 4 illustrates the approach to close gaps in NATO Logistics Doctrine (AJPs and ALPs).

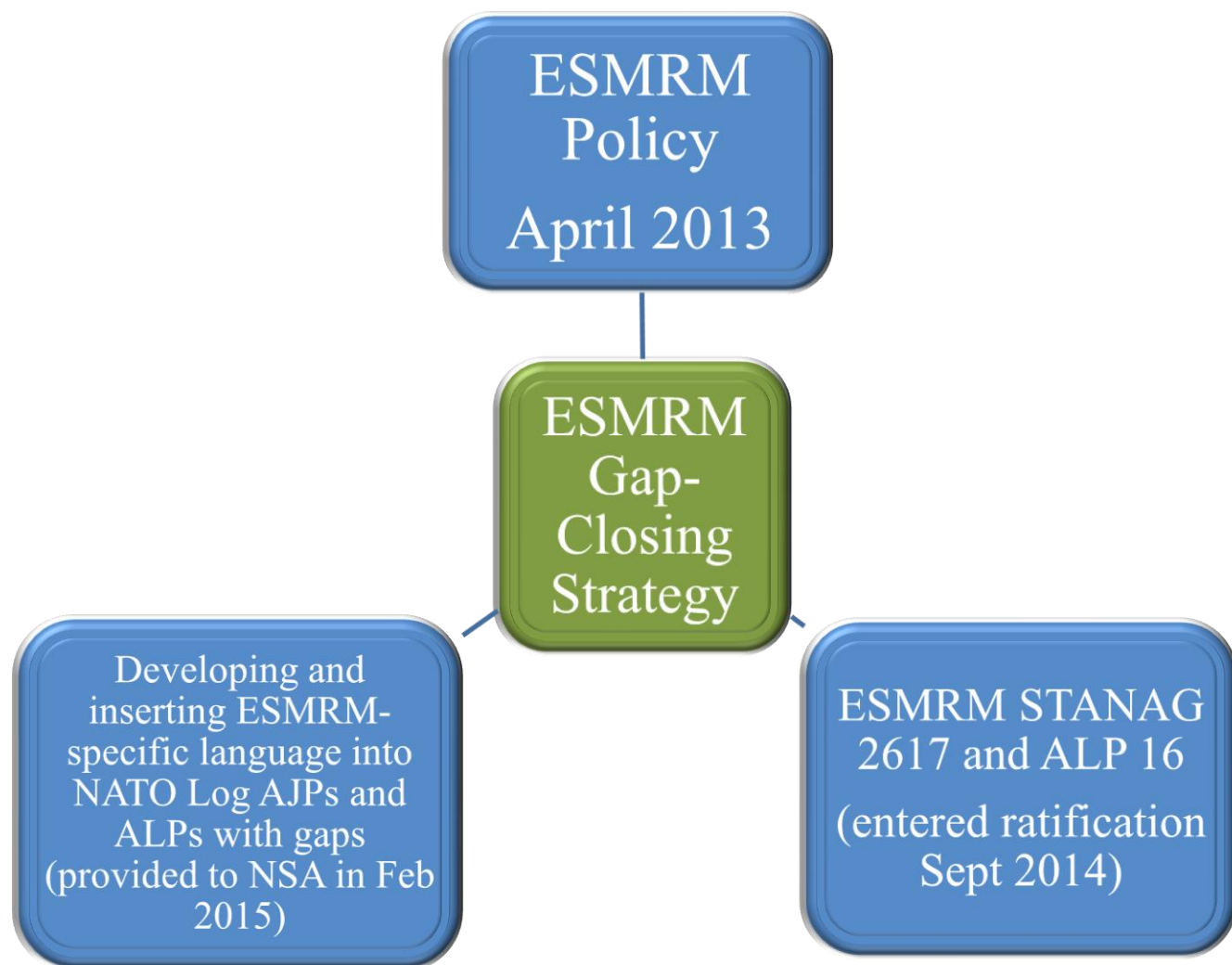


Figure 4. ESMRM Approach to Close Gaps in NATO Logistics Doctrine (AJP and ALP)

8. CREATING A BODY TO CLOSE THE NATO ESMRM GAPS – THE ESMRM ALLIED LOGISTICS PUBLICATION (ALP-D) PANEL

8.1 A Central Body to Manage ESMRM. Although the ISAF, Canadian, and U.K. reports called for the development and integration of explosives safety into operational processes including planning and operations, collectively all the studies fell short of recommending an approach that created a body responsible for integrating explosives safety requirements across the NATO enterprise. In hindsight, the call for Allied Command Operations (ACO) to take steps on their own to address explosives safety issues was not likely to happen without a central body managing the process.

Equally as important as the U.K., CAN, U.S. and other nations' recommendations to close the identified gaps in NATO doctrine was the NATO Standardization Agency (since renamed to the NATO Standardization Office (NSO)) recommendation to establish an Explosives Safety Munitions Risk Management (ESMRM) Allied Logistics Publication Development (ALP-D) Panel.²⁹ The ESMRM ALP-D Panel (hereafter referred to as the ESMRM Panel) creation took place on 25 July 2012 as part of the Logistic Committee Standardization Working Group (LCSWG) approved terms of reference (TOR).³⁰

The ESMRM Panel was envisioned to serve two primary functions. First, to manage the ESMRM business of closing the previously identified gaps and developing required doctrine. Second, and equally as important for long-term integration, to establish and maintain communication between the explosives safety, logistics, operational, and planning communities. Once established the Panel could address existing and emerging issues and ultimately preclude potentially catastrophic situations from recurring like those that had developed in Afghanistan due to lack of chain of command awareness, doctrine, required processes, combined with unforecasted increases in operational tempo.

The Panel's responsibilities included developing a central ESMRM Allied Logistics Publication (ALP) and taking actions to close the gaps in existing NATO Logistics policies and doctrinal documents. Further, the ESMRM Panel also assisted Canada, leading the ESMRM Ad Hoc Panel, with the development and coordination of the ESMRM Policy.³¹

The Panel's successes or failures depended largely on whether appointed NATO operational, logistics, and explosives safety representatives actively participated and contributed to the ALP development and gap closure process. Fortunately, individuals appointed from the operational community (SHAPE J4³² and NATO HQ logistics personnel) and national explosives safety representatives³³ engaged and actively contributed throughout the process.

8.2 ESMRM Panel Accomplishments - Resource Conscious, and Output-Oriented.

Between June 2012 and December 2014, the Panel met seven times and completed the tasks assigned by NATO AC/305 LC. To maximize NATO and national attendance and participation and to keep travel costs to a minimum, the ESMRM Panel held meetings during the same timeframe as AC/326 CASG or AC/305 LCEGS meetings at NATO HQ in Brussels.

Figure 5 illustrates the Panel's significant events and accomplishments and Table 1 identifies specific accomplishments as well as anticipated actions for 2015.

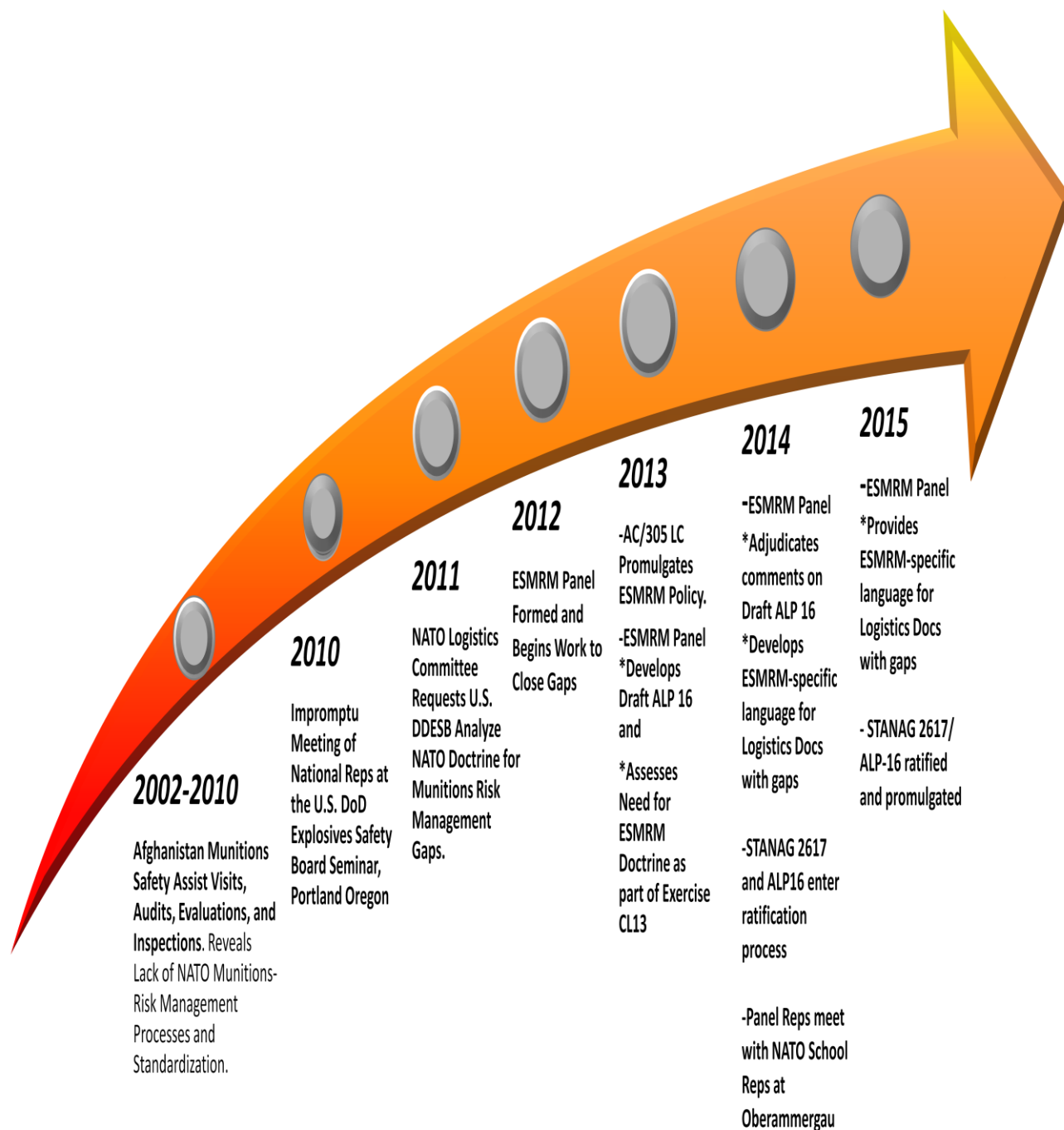


Figure 5. 2002-2015 Significant Events Timeline

YEAR	ACCOMPLISHMENTS
2012	<ol style="list-style-type: none"> 1. ESMRM TOR approved by LCSWG (May). 2. ESMRM Panel Formed and holds 1st meeting (Jun). 3. Assisted Canadian-chaired Ad Hoc WG to develop ESMRM policy statement” (Jun-Dec). The LC promulgated the ESMRM policy in Apr 2013.³⁴
2013	<ol style="list-style-type: none"> 1. ESMRM Policy formalized by LC AC/305 (Apr). 2. Validated need for ESMRM policy and doctrine by assessing Exercise Capable Logistician 2013 (Jun). 3. Completes initial ALP 16 draft. 4. LC AC/305 approved ESMRM Implementation Strategy proposal during Fall meeting (Nov).
2014	<ol style="list-style-type: none"> 1. ESMRM becomes NATO Smart Defence Tier 2 (2.87) initiative (Jan). 2. Adjudicated Nations’ on ALP-16 comments (Mar). 3. ESMRM becomes Smart Defence Tier 1 (1.34) initiative (Apr). 4. Completes 1st draft of STANAG 2617/ALP-16 Allied Logistics Publication for Explosives Safety and Munitions Risk Management (ESMRM) in NATO Planning, Training and Operations. 5. Completes revised STANAG 2617/ALP 16 draft and enters into ratification³⁵ (Sep). 6. Met with NATO school reps in Oberammergau, GER to discuss approach for integrating ESMRM into curriculum (Oct). 7. Develops ESMRM-specific language for the 12 Logistics publications identified to have gaps in 2011Gap Analysis³⁶ (Dec).
2015	<ol style="list-style-type: none"> 1. ESMRM Panel Chair recommends realigning Panel directly reporting to LCEG–(S). Feb 23, 2015 LCEG–(S) concurs with recommendation.³⁷ 2. Provides ESMRM-specific language for the 13 Logistics publications identified to have gaps to the NSO (June). 3. Active engaged in STANAG 2617/ALP-16 ratification and promulgation process. 4. Actively engaged to realign Panel within AC/305.

Table 1. ESMRM Panel Accomplishments

8.3 Critical Observation during the ALP-16 Development Process – An ESMRM Implementation Approach. Early in 2013, as the ESMRM Panel rapidly developed the ALP, Panel members realized that successfully closing the ESMRM gap within NATO required both sound doctrine as well as specific implementing actions. The Panel agreed that taking implementing actions was not only the logical next step, but also essential to precluding the recurrence of similar issues identified in Afghanistan during future NATO operations.

To communicate the Panel's findings and obtain approval for the ESMRM Implementation Strategy, the ESMRM Chair requested to update the LC on the Panel's progress. During the 7 November 2013 LC meeting,³⁸ the ESMRM Panel Chair, informed the LC that the Panel had completed the Study Draft of ALP-16 (and its covering STANAG 2617). Also during the update, the Chair advised that effectively integrating ESMRM into the NATO enterprise required implementing actions once STANAG 2617 was promulgated. Figure 6 illustrates the ESMRM Implementation Approach in 2013.

The recommendations made during the 7 November 2013 LC meeting resulted in the LC agreeing³⁹ with the recommendation to implement actions to close ESMRM gaps, the ESMRM implementation approach specifically required:

1. Evaluating existing NATO training plans and exercises and develop ESMRM-specific annexes in support of existing and future plans for exercises and Alliance Operations and Missions (AOM).
2. Developing a NATO ESMRM munitions risk assessment capability via the existing ESMRM Panel, in partnership and close cooperation with AC/326 CASG; to assess existing NATO plans for training, exercises and AOM.
3. Developing an ESMRM training module in concert with the NATO School in Oberammergau, Germany.

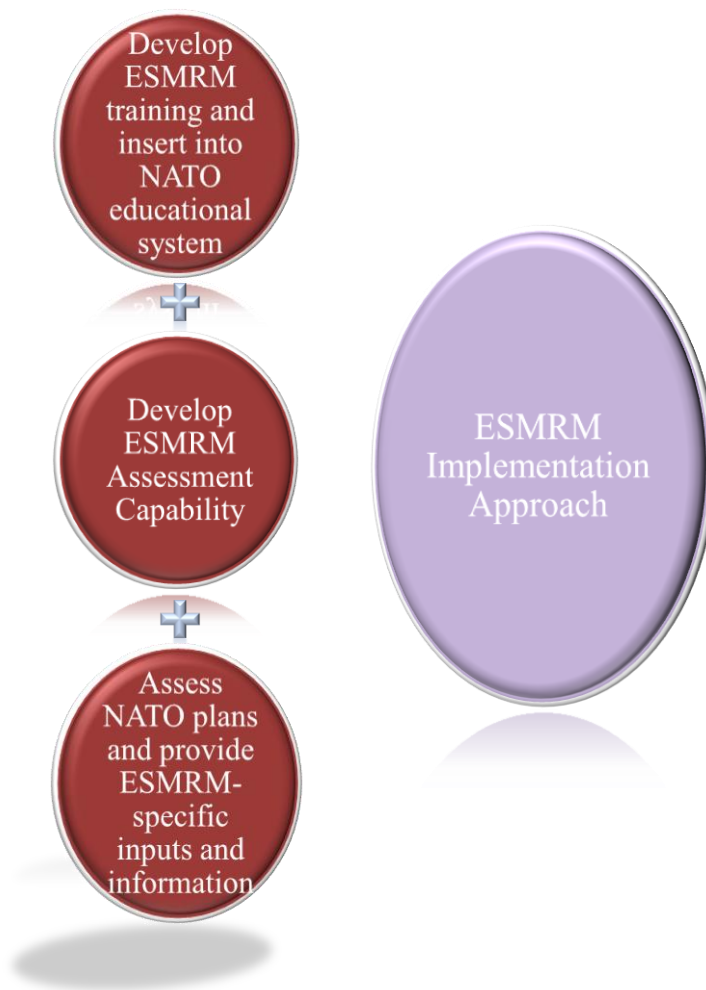


Figure 6. ESMRM Implementation Approach - 2013

8.4 Furthering the ESMRM Message through Communication. As the result of the Panel’s activities and output, significant momentum existed within the U.S. and NATO in support of the ESMRM initiative and actions. During the December 2013 AC/326 CASG Main Group meeting, the idea to include ESMRM as a Smart Defence initiative took hold.

Mr Ernest J. Herold (Deputy Assistant Secretary-General/ Defense Investment) presented his thoughts on the “Outcome of the Fall 2013 CNAD” during the December 2013 AC/326 CASG meeting. His presentation addressed the broader outlook on the NATO Defence Planning Process (NDPP), Smart Defence and Connected Forces Initiative.⁴⁰ During Mr. Herold’s comments, he addressed the difficulties related to implementing CNAD guidance in terms of linking CASG activities to NATO Smart Defence and Connected Forces Initiatives projects in the CNAD Implementation Matrix. The importance of close compliance with CASG-agreed standards had been demonstrated in Afghanistan, for example, where doctrinal and operational gaps between standards and practice have endangered the safety of personnel, among others.⁴¹

Mr. Herold also agreed and stated that enhanced engagement with CNAD directives was essential. Existing initiatives related to CASG, such as the Explosives Safety and Munitions Risk Management (ESMRM), should be integrated into the NDPP in order to increase visibility and recognition.⁴²

During Mr. Herold's speech, the idea came about to propose ESMRM as a NATO Smart Defence Initiative. The Panel chair believed that the Smart Defence framework would help communicate the benefits of ESMRM to NATO on a large scale. Smart Defence⁴³ is one of NATO's tools designed to rebalance defence spending and the capabilities generated between the European member countries, CAN and the U.S. Consequently after completing the required steps coupled national and NATO coordination, ESMRM became a Tier 2 SDI in February 2014. As the result of the program's maturity, outputs and support from several nations, ESMRM was elevated to a Smart Defence Tier 1 (1.34) project in May 2014.⁴⁴

ESMRM supports 3 of the 5 NATO Smart Defence pillars identified during the Lisbon summit including: (1) Maintenance of readiness, (2) Training and force preparation, and (3) Effective engagement and force protection.

9. THE ESMRM PROCESS OUTPUT IN SUPPORT OF NATO COMMANDERS MISSION

9.1 ESMRM Output – Keeping the Commanders and Their Time In Mind. The ESMRM assessment process results in a report that provides the NATO Commander necessary information to support his or her informed risk decision for any remaining munitions-related risks that cannot be eliminated. The ESMRM process and output not only identifies munitions-related risks to and from munitions but as importantly, the process requires providing the Commander with risk-reducing alternatives.

The ESMRM assessment output consists of a combination of U.S.-developed risk calculation tools and commercially modified Geographic Information System (GIS) technology that produce an easily understood graphic. The ESMRM output was developed with the Commander and his staff in mind. Typically a staff has approximately 10 minutes or less to brief a senior decision-maker; therefore, the information supporting a risk-decision must be easily understood and communicated clearly in a small window of time using a few slides.

Figure 7 illustrates information supporting the senior leader's decision, identifies encumbered areas, provides details concerning potential personnel casualties, and effected infrastructure replacement values.

9.2 ESMRM Assessments to Date. Since the U.S. implementing instruction CJCSI 4360.01 became effective in 2012, the U.S. has conducted over a dozen ESMRM assessments including operational locations within all of the major U.S. Combatant Commands. Examples of U.S. ESMRM assessments completed to date include:

- Recurring bi-lateral and multi-national training exercises such as Cobra Gold and Balikatan (U.S. Pacific Command (PACOM)).
- Commercial seaports (U.S. European Command (EUCOM), U.S. PACOM).
- Joint military and commercial use airports (U.S. African Command (AFRICOM), U.S. PACOM).
- Forward operating sites, bases, and locations (U.S. AFRICOM and U.S. Central Command (CENTCOM)).

It is worth noting that when presented outputs from munitions-risk assessments, senior military and civilian leaders have not asked why munitions-risks assessments are performed, rather, several leaders asked why munitions-risk assessments had not been done as part of planning, training, and operations in the past.

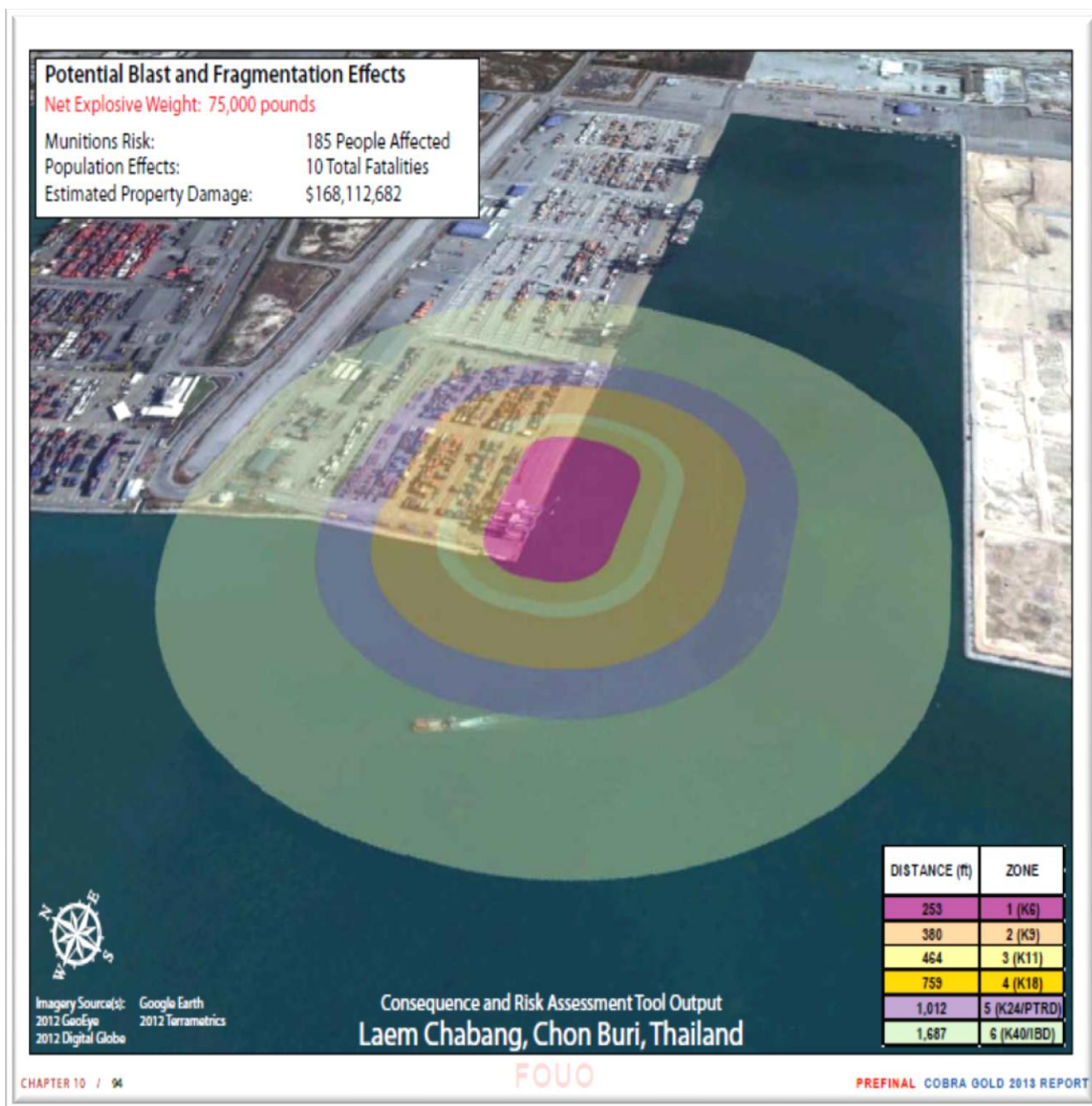


Figure 7. ESMRM Output in Support of the NATO Commander’s Risk Decision

Although the ESMRM process is robust and involves information-gathering, analysis, and developing risk-reduction recommendations, the output is designed to facilitate a senior leader’s decision by providing clear and precise information in an easily understood format. As stated at the beginning of this article, when fully implemented the ESMRM process and outputs improve NATO’s operational capability and enables NATO Commanders to make informed risk decisions in support of the NATO mission.

10. A COMPREHENSIVE AND SUSTAINABLE ESMRM STRATEGY

10.1 Current ESMRM Strategy. ESMRM actions accomplished between 2010 and 2014 fall into the following main areas:

1. **Requirements Development and Harmonization.** Developing and promulgating ESMRM Policy and STANAG 2617/ALP 16, harmonizing AASTPs 1 and 5, closing gaps in 12 NATO Logistics documents.
2. **Communication.** Wrapping ESMRM into Smart Defence, and establishing lasting partnerships with the LC, ACO, ACT, and AC/326.
3. **Implementation.** Developing the ESMRM assessment capability, assessing plans, exercises and operations, and developing/imbedding training within NATO.

10.2 Adding a 4th Part to the ESMRM Strategy – Outreach. Although a significant amount of effort and resources have been invested by many individuals as well as national and NATO organizations, ESMRM integration would benefit from an Outreach Strategy. The trademark of effective outreach includes regularly and consistently informing, educating, and training NATO personnel about the existence and importance of munitions and ESMRM requirements throughout NATO. Although communication and outreach are similar, the main difference is that outreach requires that ESMRM Panel members routinely reach out to inform, educate, and train people; whereas the communication strategy involves integrating ESMRM into established groups and NATO projects and initiatives. Figure 8 illustrates the comprehensive NATO ESMRM Strategy.

Perhaps mundane or even obvious, a consistent message to leadership and action officers is vital in light of the fact that military personnel regularly change assignments. Not to be overlooked is that civilian personnel also take different positions and retire over time. Even the most receptive and supportive new staff member or leader requires time and exposure to internalize the importance and magnitude of ESMRM. Experience has shown that on average senior leaders become familiar and comfortable with the ESMRM concepts after 2 to 3 briefings.⁴⁵

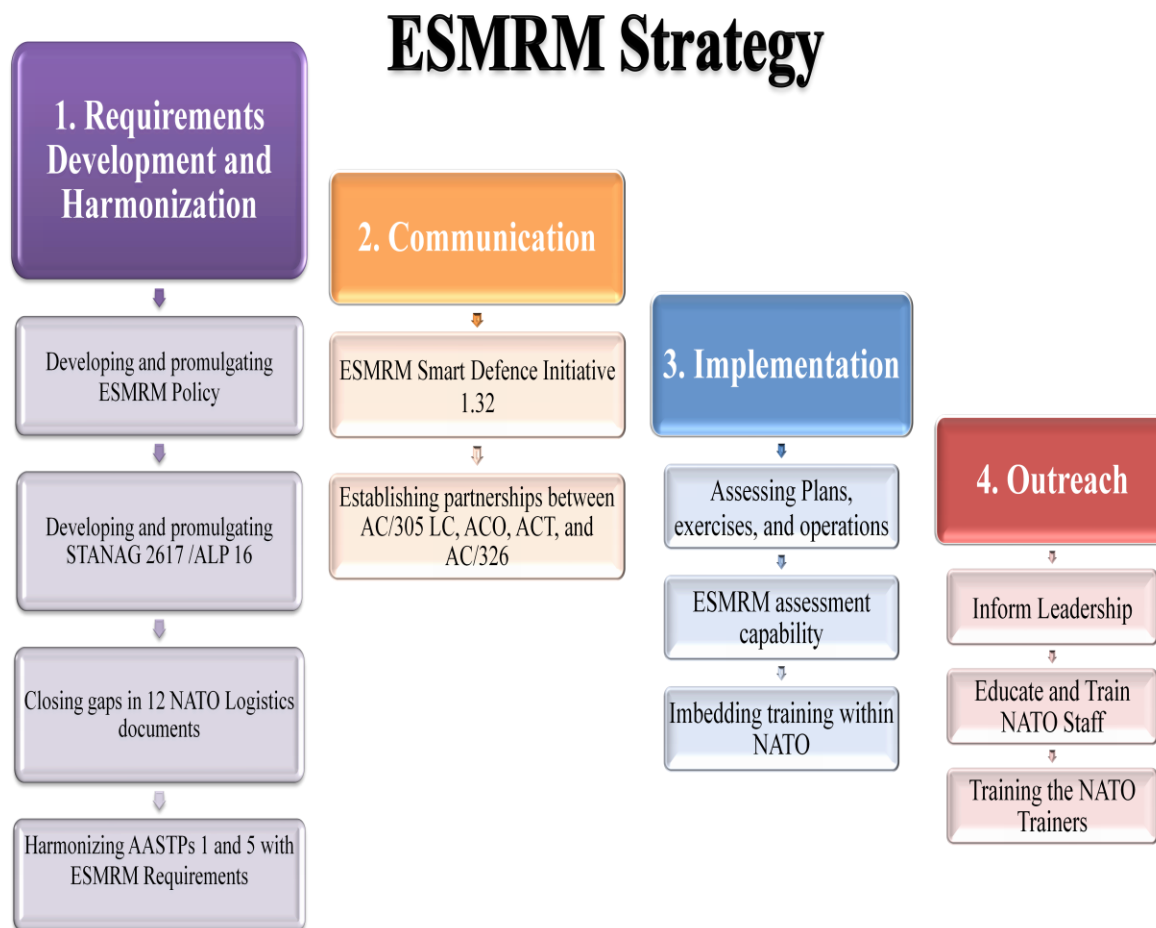


Figure 8. NATO ESMRM Strategy

10.3 Outreach and Personnel Change. One need not look further than the U.S. for an example of the importance of consistently communicating the ESMRM message to leadership. Since proposing the ESMRM initiative to the U.S. JCS in 2010, three General Officers have held the Director J4 position and three other General Officers have held the Vice J4 position. Further, another six key members of the J4 staff at the Colonel/Captain, and Lieutenant Colonel/Commander level have transitioned as well. It is probably safe to assume other NATO and national organizations with military personnel experience similar personnel turnover rates.

An essential element of “Outreach and Personnel Change” involves placing qualified munitions personnel in the right positions on the NATO staff. Specifically, having qualified munitions personnel in the SHAPE J4 as well as the subordinate commands logistics sections enables ESMRM requirements and considerations to become part of the operational discussions rather than an afterthought brought up by an external organization such as the NATO ESMRM Panel. Once NATO and the nations invest in putting qualified munitions personnel into these positions, integrating ESMRM throughout the NATO enterprise is likely to happen much more effectively in concert with NATO ESMRM efforts identified in this paper.

Since the U.S. has had the benefit of the Chairman of the Joint Chiefs of Staff Instruction on ESMRM since 2012, the U.S. witnessed first-hand the benefits of ESMRM as well as the need to have dedicated personnel to address ESMRM issues within the Combatant Commands. Due to the value-added of ESMRM, the U.S. is in the process of acquiring permanent qualified munitions personnel positions. These positions will be assigned to Combatant Commanders experiencing high level of operations. The U.S. anticipates having qualified munitions personnel filled sometime in 2016.

From the U.S. perspective, a consistent as well as persistent outreach message to senior leaders and their staff has proven vital to maintaining the momentum achieved thus far. Adding Outreach to the ESMRM Strategy accomplishes several objectives, including informing, educating, and training national and NATO personnel about the existence of national and NATO munitions and ESMRM requirements.

10.4 The Need for Outreach – Two Examples. A striking example of the need for continuous outreach and the need to inform and educate NATO personnel about ESMRM became very apparent when the MC recommended that the North Atlantic Council approve the NATO Principles and Policies for Logistics^{46, 47} in the summer of 2014. Considering that the recently published Part V of NATO Principles and Policies for Logistics affords several classes of supply and support functions separate sections,⁴⁸ addressing ammunition and ammunition management to include ESMRM within this high-level document seems logical. Furthermore, all classes of supply should be addressed in a NATO top-level policy document. In an attempt to correct this oversight, the ESMRM Panel developed specific inputs for the NATO Principles and Policies for Logistics and will submit critical information for inclusion when the document is revised.

Another example of the need to inform and educate NATO and national staff representatives manifested itself during the STANAG 2617 / ALP-16 ratification process in the spring of 2015. The NATO ratification process for STANAG 2617 / ALP-16 required ten nations approve the document and provide a timeline for national implementation before the document could enter the promulgation process. One nation ratified STANAG 2617 / ALP-16 with reservations stating that there was overlap between ALP-16 and AASTP-5. The ESMRM Panel specifically designed ALP-16 to address concerns discussed during the ISAF and Canadian Afghanistan assessment, specifically chain of command, organization and functions, as well as how to perform an ESMRM assessment in a consistent and repeatable manner. STANAG 2617 / ALP-16 once promulgated, becomes the senior NATO implementing document on ESMRM whereas AASTP-5 provides technical specifications for munitions storage in a theatre of operations. ALP-16 fills a void in NATO and complements AASTP-5 rather than overlapping and creating redundancy.

Together, the lack of a section addressing munitions-risk management coupled with the national comments during the STANAG 2617 / ALP-16 ratification process clearly demonstrate the need to educate and inform national and NATO representatives about ESMRM, its relation to and the role it plays in both national and NATO logistics and explosives safety processes. Figure 9 illustrates the NATO ESMRM authority, doctrine, policy, and technical requirements hierarchy.

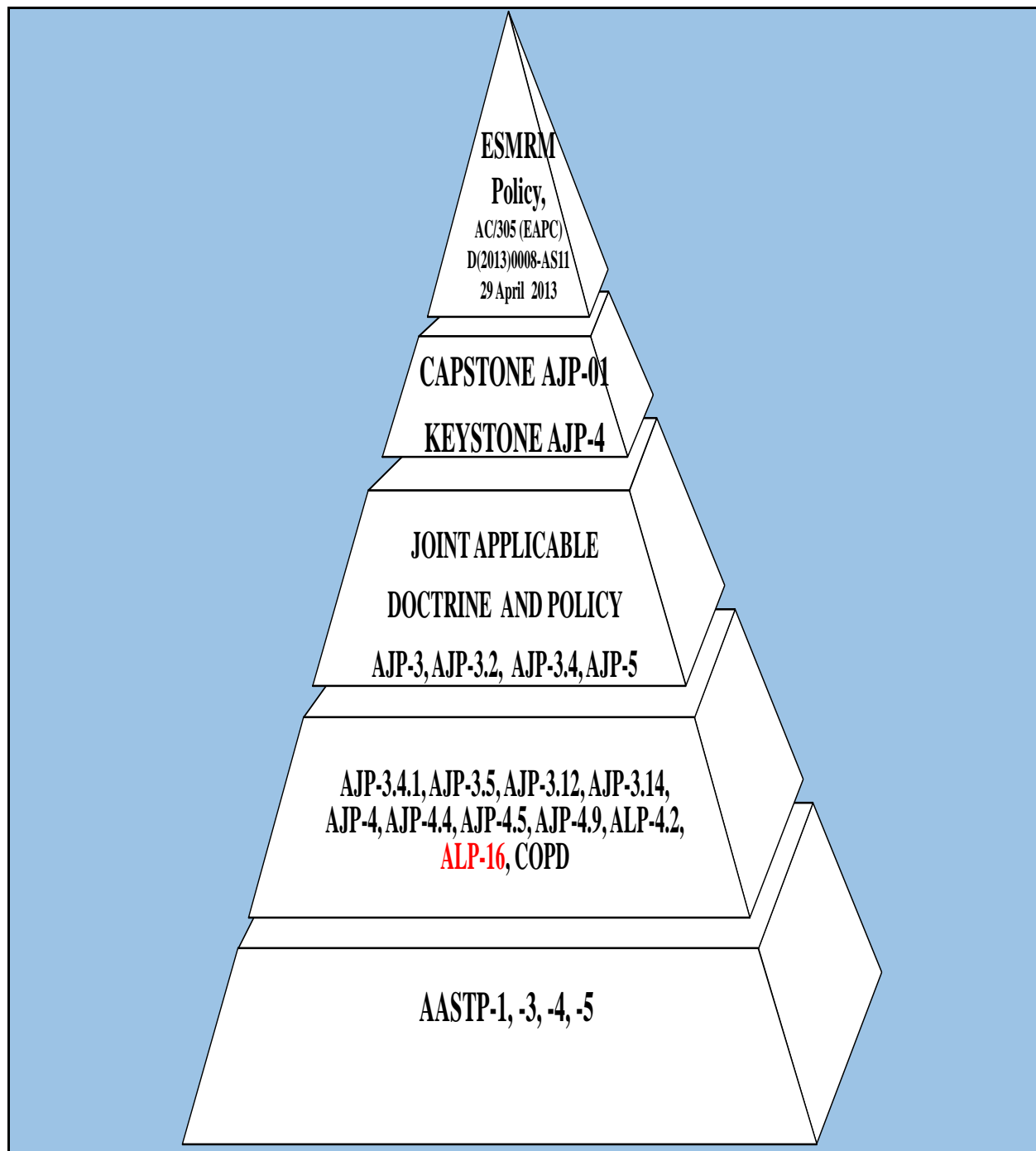


Figure 9. NATO ESMRM Authority, Doctrine, Policy, and Technical Requirements Hierarchy⁴⁹

11. CONCLUSION

Although NATO has technical explosives safety requirements, the lack of ESMRM doctrine and clear implementing directives and processes linking existing technical requirements to the NATO operational, planning, and logistics communities adversely affected the NATO mission during operations. These gaps created significant risks that were generally not brought to NATO commanders' attention during operations.

Beginning in 2010, the U.S. took steps to institutionalize ESMRM requirements into planning, training, and operations by developing a Chairman of the Joint Chiefs of Staff instruction and harmonizing U.S. requirements with existing explosives safety and other affected relevant requirements. The U.S. approach emphasizes the operational chain of command's responsibility in the risk-decision process and provides a standard methodology for consistently performing munitions risk assessments when U.S. explosives safety requirements cannot be met. In parallel, the U.S. requested NATO also take steps through AC/305 to address the lack of ESMRM policy, implementing instructions, and harmonization with other relevant NATO issuances.

NATO responded by systematically analyzing the ESMRM problem and taking similar actions to those of the U.S.; specifically developing an ESMRM policy, implementing instruction, and taking steps to integrate ESMRM requirements into relevant issuances. During the NATO ALP-16 development process, ESMRM Panel members realized that actions were needed to successfully implement ESMRM throughout NATO. Consequently, the Panel recommended the LC AC/305 adopt an implementation strategy. Once the LC concurred, the Panel began the implementation process and in parallel the U.S. also proposed ESMRM as a Smart Defence Initiative.

Considering all the parts a whole, the establishment of an ESMRM Panel to oversee the development and the implementation of ESMRM policy, ALP-16, Smart Defence Initiative, implementing actions, collaborating with essential NATO groups, and leadership support comprise the current ESMRM strategy. To succeed, the ESMRM Strategy requires continual outreach due to the nature of the military system, which involves regular rotation of military personnel for career development.

Once fully implemented, the requirements in the ESMRM policy and ALP-16 should address the problems identified in the ISAF and other national reports generated during operations in Afghanistan. Future logisticians, explosives safety professionals, engineers, planners and commanding officers should always remain vigilant to actively include ESMRM requirements into any plan, training exercise and operation since complacency and munitions are a volatile combination.

NATO should be commended for taking proactive steps to institutionalize ESMRM by

developing and adopting the ESMRM policy, implementing ALP-16 instruction, and perhaps most importantly, for creating the ESMRM Panel. The importance and continued active role of the ESMRM Panel should be emphasized. In addition to coordinating and developing ESMRM policy and implementing instruction, the Panel has liaised and brought key NATO organizations and groups together that historically did not communicate on munitions-risk matters. These organizations include:

- Allied Command Operations
- Allied Command Transformation
- Logistics Committee, AC/305
- CNAD Ammunition Safety Group AC/326 (CASG)

When fully developed, implemented, and integrated, the ESMRM process and outputs will improve NATO's operational capability and enable NATO Commanders to make informed munitions-related risk-decisions in support of the NATO mission.

Key to the Panel's success are the newly established strategic linkages between the Panel's parent committee LC AC/305, the support provided by the CASG AC/326. Fully integrating ESMRM throughout NATO requires active SHAPE and ACT engagement in planning as well as training and education. Only through the combination of active engagement and support from these strategic partners combined with continued outreach will ESMRM become part of NATO planning, training, and operations. Figure 10 (on the following page) illustrates the scope and reach of ESMRM when integrated throughout the NATO enterprise.

In summary, when NATO Commanders routinely ask for the munitions risk assessments we will know ESMRM is truly part of the NATO culture.

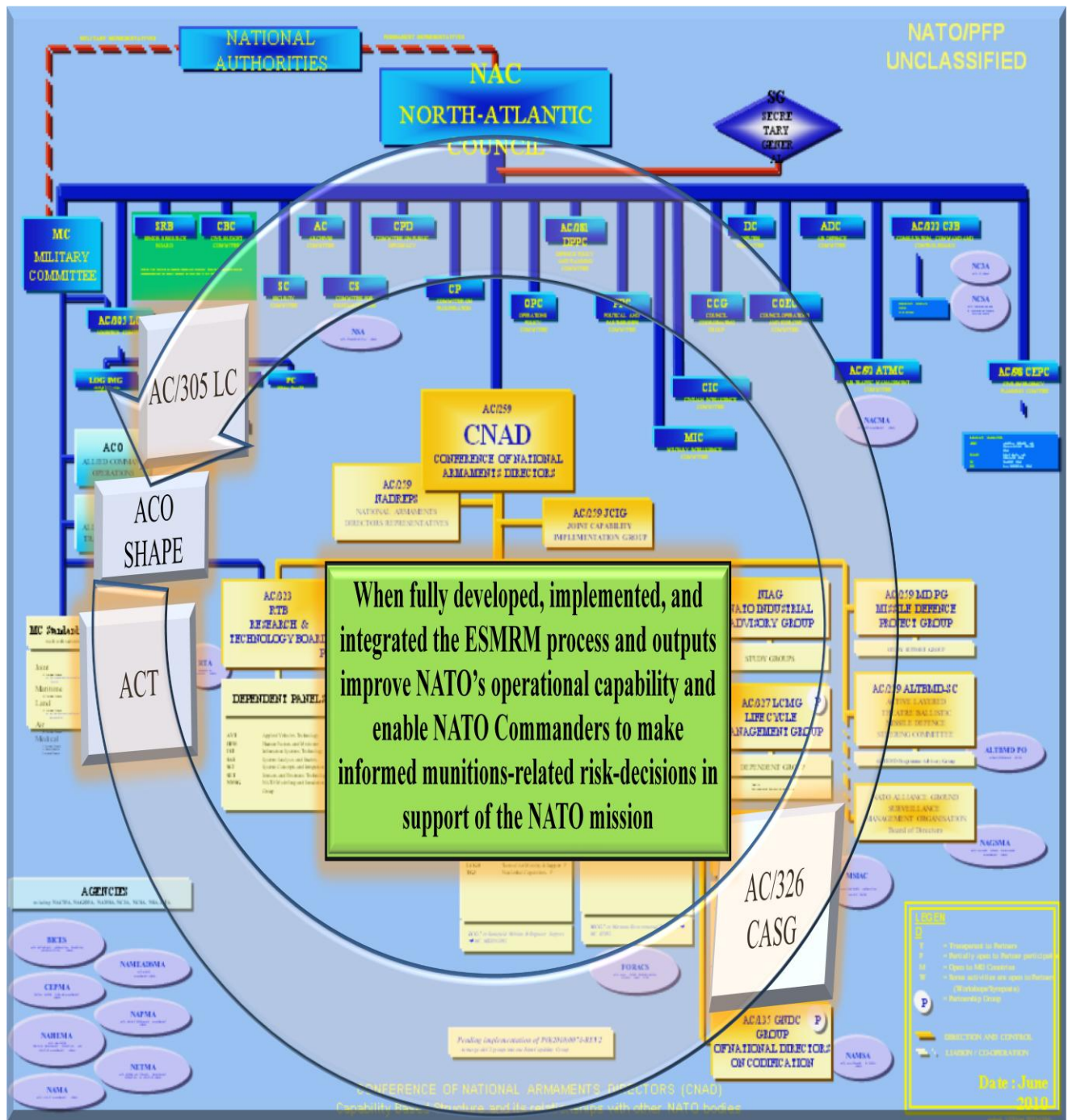


Figure 10. ESMRM When Integrated Throughout the NATO Enterprise

12. AUTHOR'S NOTE

At the time of the writing, STANAG 2617 and ALP-16 had 12 national ratification statements. Effective April 17, 2015 STANAG 2617 and ALP-16 were promulgated by the NSO with no breaks of silence by any nation. With the promulgation of NATO's ESMRM policy and implementing instruction is nearly complete. Phase 1 of the ESMRM strategy as described in Paragraph 10 above and illustrated in Figure 8 depicts required actions following promulgation.

Starting with the 8th meeting of the ESMRM Panel in June 2015 at NATO HQ in Brussels, the ESMRM Panel will turn the majority of its attention to the implementation and outreach Phases of the ESMRM strategy.

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13. ENDNOTES

¹ *NATO Explosives Safety and Munitions Risk Management (ESMRM) Policy*, AC/305(EAPC)D(2013)0008, 26 March 2013 Silence Procedure ends: 5 Apr 2013 12:00

² *Final Report - ISAF Explosives Safety Staff Assistance Visit*, 6410/ACA5LOW/09, 10 Sept 2009 (Enclosure) Allied Air Component Command HQ Ramstein,. Page 2. Para. 5. Ammunition and Explosives Safety Regulations. “While at KAF, only 2 of the 12 member nation representatives present during our in-brief were even aware/willing to acknowledge that AASTPs existed.”

³ *Munitions Safety Assist Visits, Audits, Evaluations, and Inspections*. ISAF, Canada, the U.K., and the U.S. independently assessed munitions safety in Afghanistan. 2002-2010.

⁴ *CASG Statement on Explosives Safety and Ammunition Risk Management*, DI (LMC) (2011)0014(LAND), 06 May 2011

⁵ *Final Report - ISAF Explosives Safety Staff Assistance Visit*, 6410/ACA5LOW/09, Sept 2009 Allied Air Component Command HQ Ramstein,

⁶ *Final Report - ISAF Explosives Safety Staff Assistance Visit*, 6410/ACA5LOW/09, 10 Sept 2009 (Enclosure) Allied Air Component Command HQ Ramstein,. Page 2.

⁷ *Ibid.* Pages 2-7 1. Ammunition and Explosives Safety Regulations. 2. Explosives Safety Management. 3. Organization. 4. Training. 5. Risk Analysis and Risk Management. 6. Licensing

⁸ *Ibid.* Page 7.

⁹ *Ibid.* Page 3. Para. 9.

¹⁰ *AASTP-1 Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives*, Edition 1, Change 3, May 2010

¹¹ *AASTP-5 NATO Guidelines for the Storage, Maintenance and Transport of Ammunition on Deployed Missions or Operations*, Edition 1 Version 2, October 2012. (Note – this IWP is included in the latest version of AASTP-5, Edition 1 Version 2, October 2012)

¹² *Canadian Ammunition Support Challenges in Afghanistan*. Memorandum for Key Delegates of AC/326 Sub-Groups 6 and MSIAC, 16 March 2009. Mr. André Pelchat, Director (Canadian) Ammunition and Explosives Regulation, AC/326 Canadian representative. Mr. Pelchat’s letter forwards the “*Report Canadian Ammunition Support Challenges in Afghanistan*” written by LCol J.F. Lemoine and Maj R. McCavour and presented at the US DoD Explosives Safety Seminar 12-14 Aug, 2008.

¹³ *AASTP 5, NATO Guidelines for the Storage, Maintenance, and Transport or Ammunition on Deployed Missions or Operations AASTP-5, Edition 1*. March 2009. Section 5.5 “Consequence and Risk Analysis” “To be included in revised version of this document. Text in PFP(AC/326-SG/6)WP(2007)0001 dated 18 May 2007.

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¹⁴ *Assessing Explosives Safety and Munitions Risk Management (ESMRM) in Select NATO Allied Joint and Allied Logistics Publications*, DoD Explosives Safety Board, Oct 2011. ALP-4.2(A) Land Forces Logistics Doctrine was identified as a key logistics document that should have an ESMRM connection.

¹⁵ *The Afghanistan Experience – A Compelling Case for Multi-national Cooperation*, Major General Ian Poulter (CAN) Keynote Address to the 334th DDESB Seminar, Portland Oregon July 10, 2010.

¹⁶ *Ibid.* Page 2. “Now... you can develop the most sophisticated standards and agreements in the world; however, if the standards and regulations are not well understood and incorporated into the Operational Planning Process and executable in a complex and dynamic battlefield, I would submit to you that the important safety principles which are undoubtedly being followed nationally during peacetime training, are not being fully utilized when it counts the most – when our collective forces are using ammunition in a theatre of operations.”

¹⁷ CASG, AC/326 Chairman Mr. Patrick Lamy, briefed the Logistics Staff Meeting about AC/326 concerns; specifically the lack of communication and engagement with the operational elements within NATO. 15 Sep 2010

¹⁸ *Memorandum for the Chief, Joint Doctrine and Education Division, Joint Doctrine Development Community*, Subject: 46th Joint Doctrine Planners Conference (JDPC) Minutes, 8-9 Nov 2010, 12 Nov 2010. Page 3. Although the JDPC decided that a standalone Joint Publication (top-level doctrinal document) was not needed, the group unanimously supported the need for clarifying instructions in a standalone issuance that would be more beneficial to the operational community. The group recommended working with the JCS J4 to develop a JCS Instruction as well as to close the gaps in existing U.S. issuances to include U.S. JPs.

¹⁹ *Assessment of a Project Proposal for Explosives Safety and Munitions Risk Management*, SHAPE CPP SPO, 23 Feb 2011

²⁰ *CJCSI 4360.01 Explosives Safety and Munitions Risk Management in Joint Operations Planning, Training, and Execution*, 29 Feb 2012. As required by the JCS J4 development of the joint instruction was completed within 12 months and the document entered the staffing process in 2011.

²¹ *Ammunition Safety on Deployed Operations*, Major General JS Mason MBE Royal Marines, Assistant Chief of Defence Staff(Logistics Operations) Ministry of Defence (U.K.), 6 Jan 2011. The U.K. letter referred to the Canadian paper PFP(AC/326 SG6)(CAN)IWP/03-2009, “Chapter for AASTP-5 Part II – Ammunition Safety on Multi-National Operations”, 23 Mar 09

²² *Ammunition Safety on Deployed Operations*, Major General JS Mason MBE Royal Marines, Assistant Chief of Defence Staff(Logistics Operations) Ministry of Defence (U.K.), 6 Jan 2011

²³ *CASG Statement on Explosives Safety and Ammunition Risk Management*, DI (LMC) (2011)0014(LAND), 06 May 2011

²⁴ *Logistics Committee Decision Sheet AC/305-DS(2011)0001*, 18 April 2011, Page 6, Paragraph 9.3.2.

²⁵ AC/305-N(2011)003, Logistics Committee Co-Chairmen’s Response Letter from the United Kingdom Concerning Ammunition Safety on Deployed Operations, 15, Mar 2011

²⁶ *Explosives Safety and Munitions Risk Management in the Joint Operation Planning Process*, DoD Explosives Safety Board Study. Sept 2010

²⁷ *Assessing Explosives Safety and Munitions Risk Management (ESMRM) in Select NATO Allied Joint and Allied Logistics Publications*, DoD Explosives Safety Board, Oct 2011

²⁸ *Recommendation 1. Develop an ESMRM Policy. Recommendation to develop a top-level LC ESMRM Policy made by Mr. Bruno Cantin, Head Logistics, Defence Policy and Planning Division, NATO International Staff during Dec2011 CASG AC/326 Main Group Meeting at NATO HQ, Brussels, Bel.*

²⁹ *Logistics Committee Executive Group (LCEG) Explosives Safety and Ammunitions Risk Management (ESMRM) in Operations, AC/305(LCEG)(EAPC)D(2012)0005, 23 April 2012 (Silence Procedure ends: 30 May 2012 12:00)*

³⁰ *Logistics Committee Standardization Working Group (LC SWG) Terms of Reference, AC/305(LCEG)(EAPC)D(2012)0010, 11 July 2012, Silence Procedure Ends: 25 Jul 2012. Appendix 3, Annex 1- ESMRM ALP-D Terms of Reference*

³¹ *Recommendation 1. Develop an ESMRM Policy. Recommendation to develop a top-level LC ESMRM Policy made by Mr. Bruno Cantin, Head Logistics, Defence Policy and Planning Division, NATO International Staff during Dec2011 CASG AC/326 Main Group Meeting at NATO HQ, Brussels, Belgium.*

³² U.S. AC/326 representative, Mr. Curtis Bowling met on two occasions with SHAPE J3 and 4 senior leadership in Mons, Belgium in 2011.

³³ ESMRM Panel typically included representatives from: Canada, Italy, France, Germany, Netherlands, U.K., US, SHAPE, NATO Logistics, NATO Munitions Safety Information Analysis Center (MSIAC)

³⁴ *NATO Explosives Safety and Munitions Risk Management (ESMRM) Policy, AC/305(EAPC)D(2013)0008, 26 March 2013 Silence Procedure ends: 5 Apr 2013 12:00*

³⁵ *STANAG 2617 Allied Logistics Publication for Explosives Safety and Munitions Risk Management (ESMRM) ALP-16, AC/305(LCEG)N(2014)0020, 10 September 2014*

³⁶ *7th ESMRM Panel Meeting, 8-9 Dec 2014, NATO HQ Brussels Belgium. ESMRM gap-closing language provided to NSA in Feb 2015.*

³⁷ Logistics Committee Executive Group, AC/305(LCEG)(EAPC)DS(2015)0001, Decision Sheet, 23 February 2015. Para 3.2. "3.2 noted the ESMRM Panel Chairman (absent due to inclement weather) briefing, provided on his behalf by the LC SWG Secretary, and agreed to move the ESMRM Panel directly under the LCEG(S), after promulgation of ALP-16."

³⁸ Logistics Committee (LC) AC/305-DS(2013)0004, Decision Sheet for Meeting held in NATO-only format at NATO HQ, Brussels on Thursday, 7 November 2013 at 12:00hrs, 6 December 2013 Silence Procedure ends: 20 Dec 2013 12:00, Page 4, para. 6.2.1 – 6.2.3. Excerpt from Decision Sheet below.

6. EXPLOSIVES SAFETY/MUNITIONS RISK MANAGEMENT (ESMRM)

The Logistics Committee:

6.1. noted the report by the United States on the progress made with the implementation of the ESMRM Policy and encouraged the involved parties to finalize the implementation at the soonest;

6.2. agreed the recommendations made on the way ahead, i.e.:

6.2.1. to evaluate existing NATO training plans and exercises and develop ESMRM- specific annexes in support of existing and future plans for exercises and Alliance operations and missions (AOM);

6.2.2. to develop a NATO ESMRM munitions risk assessment capability via the existing ESMRM Panel, in partnership and close cooperation with AC/326 (Ammunition Safety Group); to assess existing NATO plans for training, exercises and AOM; the United States has already developed this assessment capability and could provide experiences and lessons learned to establish the NATO ESMRM assessment capability; and

6.2.3. to develop an ESMRM training module in concert with the NATO School in Oberammergau, Germany.

³⁹ *Ibid.* Page 4, para 6.2.

⁴⁰ AC/326-DS(2013)0002-PART1 (PFP), *Decision Sheet, CNAD Ammunition Safety Group (AC/326)*, 25 February 2014 (Twenty-Second Meeting held at NATO HQ, Brussels on 12-13 December 2013). Presentation by DASG/DI on the outcome of the Fall 2013 CNAD. Pages 2-3.

⁴¹ *Ibid.* Page 3. Para 4.2.

⁴² *Ibid.* Pages 2-3. Para 4.3.

⁴³ NATO Smart Defence Webpage. Updated 4 Feb, 2015. http://www.nato.int/cps/en/natohq/topics_84268?

Smart Defence is a cooperative way of generating modern defence capabilities that the Alliance needs, in a more cost-efficient, effective and coherent manner.

Allies are encouraged to work together to develop, acquire, operate and maintain military capabilities to undertake the Alliance's core tasks.

Projects cover a wide range of efforts addressing the most critical capability requirements such as precision-guided munitions, cyber defence, ballistic missile defence, and Joint Intelligence, Surveillance and Reconnaissance to name a few.

From 2008 onwards, the world economy has been facing its worst financial period since the end of the Second World War. Governments have been applying budgetary restrictions to tackle this serious recession, which is having a considerable effect on defence spending.

Furthermore, the Alliance's security environment has been changing, and has become more diverse and unpredictable. The most recent crisis in Ukraine serves as a reminder that peace and stability cannot be taken for granted, and that the Alliance needs to invest in sufficient defence capabilities.

Rebalancing defence spending and the capabilities that are generated between the European member countries, Canada and the United States is a necessity now more than ever. The other Allies must reduce the gap with the United States by equipping themselves with capabilities that are deemed to be critical, deployable and sustainable, and must demonstrate political determination to achieve that goal. There must be equitable sharing of the defence burden. Smart Defence is one of NATO's tools to meet this challenge.

Smart Defence in the Long Term. At the Chicago Summit in 2012, NATO leaders agreed to embrace Smart Defence to ensure that the Alliance can develop, acquire and maintain the capabilities required to achieve the goals of NATO Forces 2020: modern, tightly connected forces that are properly equipped, trained, exercised and led. Since then, Smart Defence has developed into a major consideration by Allies to deliver needed

capabilities in a cost-effective and efficient manner. This is reflected through an extensive portfolio of evolving projects and proposals and an ever-growing number of successfully completed efforts. The later have been delivering real benefits to Allies through the formula of doing things together instead of doing them alone.

⁴⁴ Status Report 32 on Smart Defence Multi-national Projects, DI(STR)(2012)0008 REV31, 6 May 2014, Page 1

⁴⁵ Since 2010, the author has briefed over 50 separate General/Flag Officers and members of the Senior Executive Service on ESMRM topics.

⁴⁶ *NATO Principles and Policies for Logistics*, Military Decision on MC 0319/3, 9 July 2014

⁴⁷ C-M(2014)0043-AS1, Action Sheet NATO Principles and Policies for Logistics – MC 0319/3, Action Sheet

⁴⁸ *NATO Principles and Policies for Logistics*, Military Decision on MC 0319/3, 9 July 2014, Part V- Policies for Logistics Functions, Pages 14-19 (Specific Sections: Supply, Equipment Maintenance, Movement and Transportation, Reception, Staging, Onward Movement and Integration, Petroleum Operations, Services, Contractor Support to Operations, Host Nation Support, Medical Support)

⁴⁹ *Allied Logistics Publication for Explosives Safety and Munitions Risk Management (ESMRM) ALP-16*, AC/305(LCEG)N(2014)0020, 10 September 2014, Figure 1-1. Chapter 1, Page 1.