

## **French IM position**

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### **1. Background prominent features**

The IM/MURAT concept is now familiar to the “IM community” members. The audience at this IMEMTS symposium is the perfect demonstration. This result is nevertheless the product of a long process that started more than 30 years ago.

At that time, catastrophic accidents such as those that happened on CVN Forrestal and Enterprise, were initiated by explosives, and make the stakeholders to be plainly aware of the risks, at first in western nations equipped with CVN : munitions had to be destructives for the enemy side but safe for the friend side.

Fortunately, technological progress carried out in these countries, made this requirement relatively easy to be reached. They had already a strong knowledge in the nuclear safety systems (weapons and platforms). The reduction of the hazard resulting from explosives and propellants was intensely investigated.

During the eighties, western nations, and particularly the United-States, United Kingdom and France, deeply considered the subject and drawn up munitions safety policies. The numerous exchanges of information between these countries generated a productive emulation. The intensifying need to harmonize the policies with NATO partners, made the western nations to be involved in the process too.

The end of the cold war, the appearance of new kinds of conflicts, the constant need for improved safety, the “zero casualty” concern fed and oriented the considerations. They were formalized in 1998 through the promulgation of the STANAG 4439 and the related AOP39. The NATO nations have since at their disposal an operative and efficient structure to define, to procure, and to have in service insensitive munitions.

### **2. French approach**

At the very beginning, France was involved in the improvement of technologic knowledge that was requested. From the sixties, researches were emphasized on synthesis and formulation of *EIDS*. The understanding of initiation and decomposition mechanisms of explosives made progress. An improvement in the control of catastrophic hazard was becoming possible, by a better control of explosives behavior (sensitiveness and explosiveness) or by limiting the effects through deconfining and venting systems.

At this period, the construction of the French CVN Charles de Gaulle dictated an outstanding effort to make the munitions safer. This landmark accelerated the formalization of the French MURAT policy relative to the insensitive munitions.

The “délégué général pour l’armement” approved the French IM policy (Instruction DGA/IPE 260) in 1993. This instruction is considered as the implementation document after the ratification by France of the STANAG 4439 in 1999. This instruction defines the three MURAT labels and appoints the “inspecteur de l’armement pour les poudres et explosifs” as national authority to assign the labels.

The definition of the three MURAT labels is the most emblematic feature in the instruction. They characterize the more and more residual hazard of munitions versus the nine commonly accepted threats. This assignment policy is positive and will go on.

In this context, the French approach on insensitive munitions has firstly involved the procurement organization of the ministry of defense (DGA) and the industry. The initial implementing objectives consisted in the procurement of “labellised” munitions to French navy for a specific and constraining safety environment. As a consequence, the diversity in munitions life cycle in the Forces and corresponding needs may have not been investigated enough. Today, the benefit in procuring and operating IM munitions is much more generally considered.

### **3. The way ahead**

As a rule, improvements are still to be obtained. For France the regulation content of these improvements is the NATO organization. The French commitment as the custodian nation in the writing of the new version of the STANAG 4439 and AOP 39 gives evidence of this orientation. Steady exchanges with partners follow as a consequence. This is of course the case with the United-States, and also with many European nations, among which the host nation of the present IMEMTS symposium.

A long-term activity is done at the national level as well. It places the best satisfaction of the needs of the Forces during the life cycle of the munitions in the center of our concerns. The goal is to formalize the operational benefits made possible by technologic progress (storage, transportation, maintenance, operating on board fighting platforms). Of course, the related economic aspect is also essential.

Actually, the future of the MURAT concept goes through a shared involvement and approval by all the actors, each of them in his area of responsibility. So as a result, orientations may be drawn.

#### **1) Quantification of MURAT objectives and labels optimization.**

Versus the nine generic threats, the MURAT signature characterizes the munitions safety level. The specification of a signature determines the level that permits the munitions to simultaneously fulfill the operational efficiency and the safety regulations. An important effort is jointly carried out in the Forces and the DGA to elaborate the best matching between the MURAT signature of the munitions and their reference life cycle.

Potentially, this process may conduct to an evolution of the MURAT labels, if it appears that specific signatures correspond better than the current MURAT signatures with the operational objectives and needs.

## 2) Reduction of logistic constraints and optimization of operational efficiency

In operation (storage, handling, on board platforms), the IM qualification of the munitions authorizes the reduction of the safety constraints during the operational uses.

When the munitions are on board a fighting platform, this IM qualification has a strong impact on the platform survivability. This consideration is an essential economic matter. It has an influence on the equipments' availability and on proficiency of armed forces.

## 3) Limitation of the impact of safety regulations on life cycle cost

Munitions spend the majority of their life in peacetime conditions where they are subject to civilian regulations relatives to explosives materials. The French regulations are based on the reduction of the failure occurrence probability and of the damage resulting of an unintended event to an acceptable level. Consequently, the constraints due to the IM qualification of a munitions are balanced by logistic advantages (storage, maintenance, transport) and therefore benefit on the life cycle cost.

The optimization of the IM signature should be an answer to such a goal.

## 4) Knowledge of national munitions status considering MURAT policy

A major objective consists in setting up the IM signatures of all the munitions in service. It is the key factor for an economic validation of any coherent approach to progressively introduce in service IM munitions qualified at the convenient level. It allows to build a step-by-step program for the acquisition of new IM as well as to select the R&T priorities in order to take cost/effective decision.