



**MINISTÈRE DE LA DÉFENSE  
ET DES ANCIENS COMBATTANTS**

# **A New Impulse for the French MURAT (IM) Policy**

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**DIRECTION GÉNÉRALE DE L'ARMEMENT**



# OUTLINE

**The French Organization**

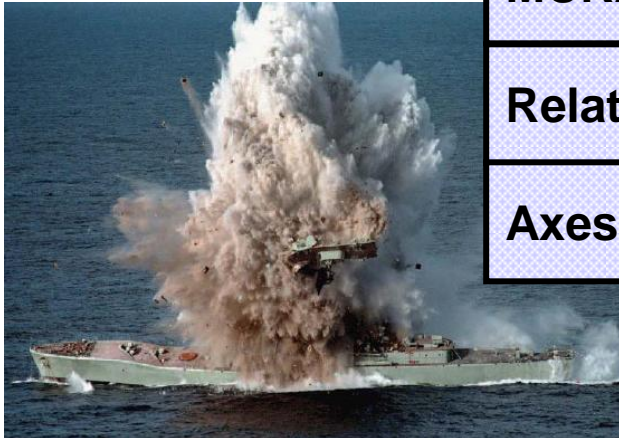
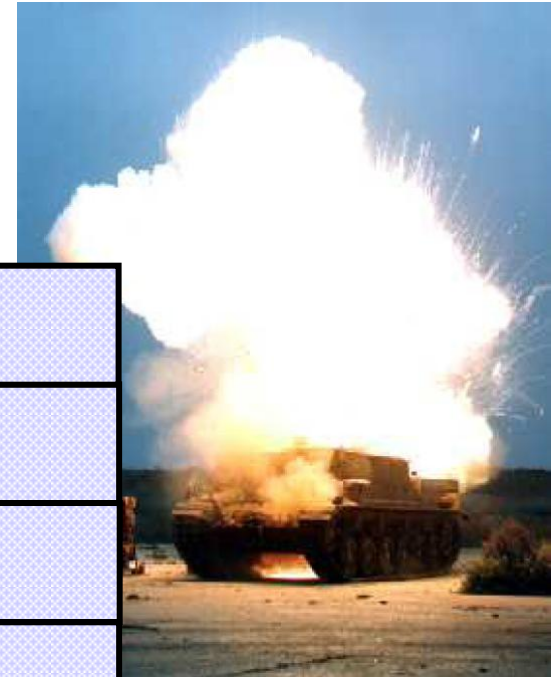
**Background**

**MURAT Current Issues**

**MURAT Policy Update**

**Related Implementation Guides**

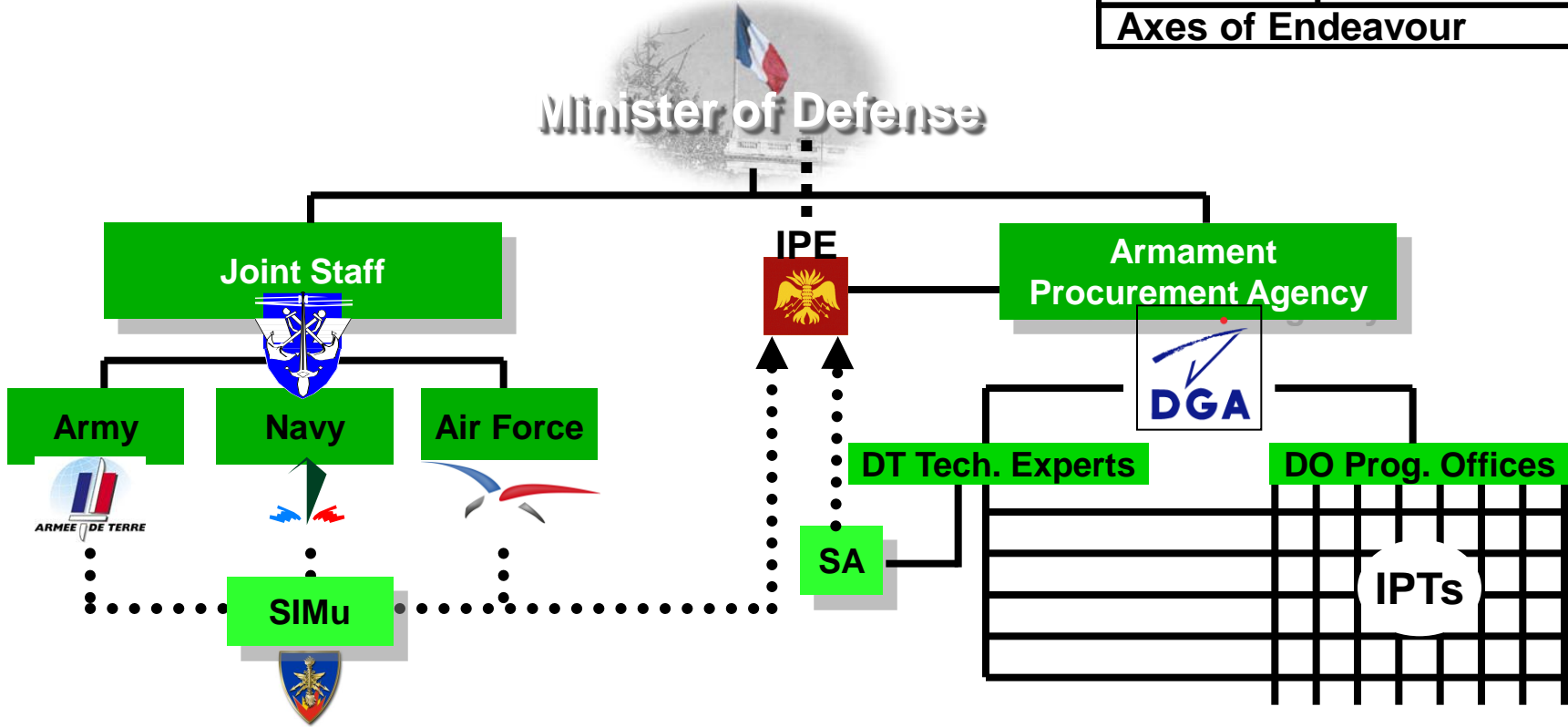
**Axes of Endeavour**





# The French Organization

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## For Munitions developed / bought by DGA:

- Safety Authority is DT/head of “Munitions, Weapons and Nuclear Systems Division”
- Safety qualification is given after mandatory advice from IPE

## For Munitions directly bought by the Forces:

- Safety Authority is the Head of Staff
- He could ask for advice / support from IPE

## IPE has a key role regarding Ammunition Safety

## IPE role and missions are directly given by the MoD



# The French Organization

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## IPE responsibilities regarding Ammunition Safety

- Give mandatory advice for Munitions Explosive Safety Qualification
- Give expertise on Munitions Explosive Safety
- Give mandatory advice for Energetic Materials Qualification
- Assign HD Classification to Munitions
- Assign MURAT Labels
- Participate to the preparation of Explosive Safety Regulation



# French MURAT Policy: a 20 years old history

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- End of the 80's, first thoughts within NATO through munitions interoperability work
- 1989: Recommendation of CGA (general MoD controller) for a concerted endeavor of both Forces and DGA on the IM/MURAT concept.
- DGA letter n° 100816 (March 1992) and DGA/IPE reference instruction n° 260 (July 1993).
- Assignment of MURAT labels by the Inspector for Propellants and Explosives
- MURAT massive investment for the nuclear aircraft carrier Charles de Gaulle
- Ratification of STANAG 4439 edition 1 in 1999 and successive revisions (now ed3)





# MURAT Policy in 2011: a contrasted Balance

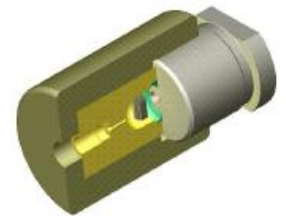
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- A real success from a technical point of view (mature technologies for most of our Munitions families, EIDS, mitigation devices...), even if remaining issues (SRM, gun propellants...)



- A prime necessity concept in our evolving world:

- Political perception and implication of Safety, judiciary consequences of any accident, interoperability in joint operations...
- Drastic increase of operational logistical constraints.



***However today, most of our munitions inventory have:***

- ***No complete IM signature***
- ***No MURAT label***
- ***Even no IM characteristics***







# Concerns with initial Policy

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- Initial **non stringent** policy:
  - Policy only described in a DGA decision letter
  - A stand alone DGA/IPE Instruction with no link with other Ammunition Acquisition Document
- Explosive Safety Regulations harmonization difficulties (NATO, UN, National) – need to better translate explicitly the logistical benefits ...
- Differences between MURAT and Munition Safety Assessment methodology when shipped on nuclear platforms (aircraft carrier)
- IM/MURAT and collateral damage : lack of data for vulnerability studies
- Lack of guidelines for the MURAT Signature Specification

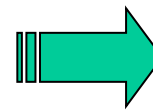




# Update of the French Policy

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- **In 2010, IPE decision to prepare a MURAT Policy Document**
  - **At the Minister of Defense level**
  - **In line with STANAG 4439**
  - **Defining logistical benefits of MURAT characteristics**
  
- **End of 2010, preparation of the policy document under the responsibility of an editorial team involving:**
  - **IPE (chairing the team)**
  - **Armed Forces joint staff**
  - **SIMu (ammunition joint office)**
  - **DGA (IPTs and technical Experts)**





# New MoD MURAT instruction

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The new MoD MURAT policy instruction has been finalized in 2011:

***Instruction DEF n°211893 issued 21st july 2011***

- Reference (STANAG) Requirements specified in any acquisition
- Any waiver to the MURAT Reference Requirements must be justified using risk based analysis methods.
- IM Signature Assessment generalized (including inventory Munitions) to give Forces information and a better understanding of explosive hazards in operations.
- Implementation of the policy should create a MoD common dialogue tool to insure the coherence between Operational Needs and R&T priorities



# New MoD MURAT instruction

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**Additional IPE instructions (technical guides) under preparation to describe/clarify the new policy implementation**

**1 - Specification of MURAT level**  
(document in approval process)

**2 - MURAT signature assessment methodology**

**3 - MURAT data base management**



# Implementation Guide 1: MURAT specification

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## ■ Initial Specification

- Reference (STANAG) Requirements must be specified in any acquisition
- **(Flexible) waiver process implementation:**
  - Process involving Project Team (DGA) - IPE - Armed Forces (end user)
  - Minimum IM signature – risk based methodology (mainly focused on consequences on warfighter and assets) to be conducted by IPT
    - If important residual risk -> IPE advice and Chief of Staff approval
    - If minor residual risk -> IPE approval
  - IM signature to be contracted -> minimum acceptable IM signature
    - Potential logistical benefits (costs) through explosive safety regulations (HD or QRA) – IM signature in the equation of explosive safety
  - Exclusion for Munitions with low risk in logistics phases (HD filtering)



# Implementation Guide 2: MURAT signature assessment

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- **Necessary Coherence and Communnality between HD and IM Level:**
  - For Testing / Evaluation
  - Complementarity between HD (maximum credible event focused) and MURAT signature (risk based) for a better Management of Risks during Logistical & Operational Phases
  - Final IM signature to be considered as any other S3 Requirement
  - Confidence level assign for each Threat considered in the IM signature
  - MURAT Labels (★, ★★ and ★★★) slightly modified to better link with STANAG 4439 and HD regulation



## Implementation Guide 3: MURAT database

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- ***For all new munitions:***  
**IM signature, HD classification, S3 assessment compiled in a Global Safety Datasheet**
- ***For (families of) inventory munitions:***  
**IM signature assessed or estimated in order to:**
  - Inform the Forces about risks associated with already in service Munitions
  - Create and maintain a database of IM signatures of Munitions in service in French Forces
  - Use it as a MoD common dialogue tool to insure the coherence between Operational Needs and R&T / Retrofit Priorities



# MURAT and explosive safety regulation

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- Munitions spend most of their life in a context strongly regulated in terms of explosive safety.
- Risk attenuation allows:
  - Logistical constraints reduction (storage, maintenance, transport)
  - Benefits through explosive safety regulation
- Introduction of quantitative risk assessment in explosive safety regulation gives more explicit gains for MURAT munitions than with traditional separation distances (QD).







# MURAT and explosive safety regulation



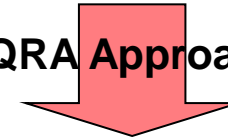
HD/QD Approach



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QRA Approach



<i>1 ton of 155 mm in ISO container – IBD distance (m)</i>					
French QD approach (current regulation)			QRA approach (1% of being hit by a fragment)		
HD 1.1	HD1.2	MURAT *	HD 1.1	HD1.2	MURAT *
400	400	270	450	300	165

***QRA methodologies should be introduced in French Explosive Safety Regulation to better translate logistical benefits of MURAT***



# QUESTIONS ?

