

European Industry involved in logistic gains assessments

IMEMG Q/D's Expert Working Group

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Quantity/Distances Expert Working Group





2003 Creation of IMEMG's Expert Working Group (EWG)

"Insensitive Munitions Quantity/Distances and benefits for the Armed Forces" (IMEMG Q/D's EWG)




- **Aims:**

- participate in the work being undertaken internationally to agree a common Hazard Division (HD) Classification for Insensitive Munitions
- analyse and compare existing national and international rules detailing the "Quantity of munitions or energetic materials / safety distances" ratios (known as Q/D's)
- act as a think-tank in the definition of specific Q/D ratios for IM







1. Hazard division assessment [1/2]

Country Organisation	Authority	Reference documentation
<p>U.N.</p> 	<p>U.N. Economic Commission for Europe (UNECE) - Transport Division</p>	<p>UN Recommendations on the Transport of Dangerous Goods, Model Regulations "Orange Book" (13th revised edition)</p>
<p>N.A.T.O.</p> 	<p>Ammunition Safety Group (AC/326)</p>	<p>Manual of NATO Safety Principles for the Storage of Military Ammunition and Explosives AASTP-1 Ed. 1 of 08/1997</p>
<p>U.S.A.</p> 	<p>DoD: Department of Defence</p> 	<p>DoD ammunition and explosives safety standards 6055.9-STD of 05/10/2004, § 9</p>

1. Hazard division assessment [2/2]

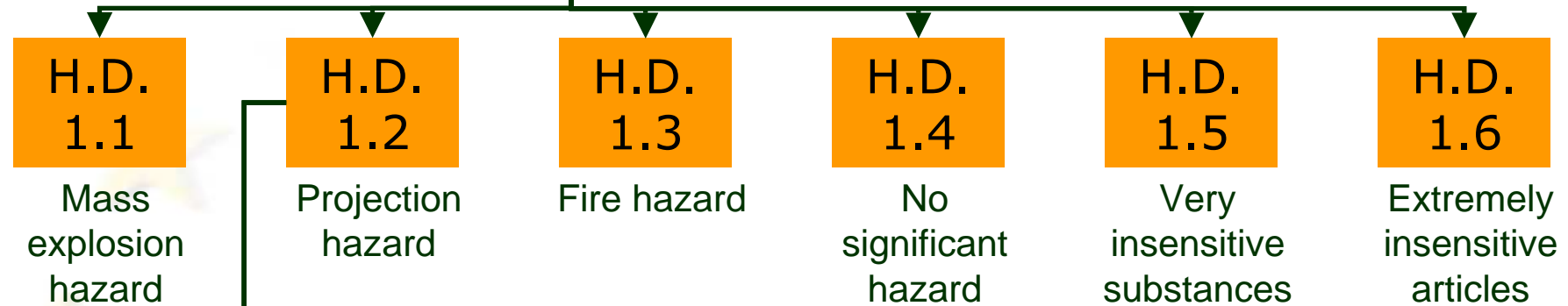
Country	Authority	Reference documentation
France 	DGA / IPE: " <i>Délégation Générale pour l'Armement / Inspection de l'armement pour les Poudres et Explosifs</i> "	Order of September 26, 1980 determining the rules for setting the safety distances implemented in Forces by French MoD Order 1007
Germany 	WIWEB: " <i>Wehrwissenschaftliches Institut für Werk-, Explosiv- und Betriebsstoffe</i> "	Central service regulation ZDv n° 34
United Kingdom 	Defence Ordnance Safety Group (DOSG)	JSP 482 "MoD Explosive Regulations Volume 1"

2. Implementation of IM policy (STANAG 4439)

Country Organisation	Policy
U.N. 	Hazard Division 1.6
N.A.T.O. 	NATO Storage Sub-Divisions (SSD) 1.2.1 / 1.2.2 / 1.2.3
U.S.A. 	Storage Sub-Divisions 1.2.1 / 1.2.2 / 1.2.3
France 	MURAT Labels ☆, ☆☆ or ☆☆☆ (Note 1358 DGA/IPE: 1.2 Unit Risk)
Germany 	Draft IM implementation concept
United Kingdom 	HD 1.6 and SSD 1.2.3 draft implementation concept

EXPLOSIVE ITEM

3. Hazard Division description



S.S.D. 1.2.1

NEQ > 1.6 lbs (0.71 kg)

S.S.D. 1.2.2

NEQ ≤ 1.6 lbs (0.71 kg)

S.S.D. 1.2.3

HD 1.2 items with IM signature:

Testing	Reaction
Slow cook-off	V
Fast cook-off	V
Bullet impact	V
Sympathetic reaction	III

4. Classification of IM: a complex issue

- Numerous rules and documents
- No coherence between national policies regarding IM

⇒ **SSD 1.2.3 is welcome to clarify the situation for IM HD assignment as issued in 2005 by AC/326 NATO Group**

Meanwhile, this SSD may be difficult to implement

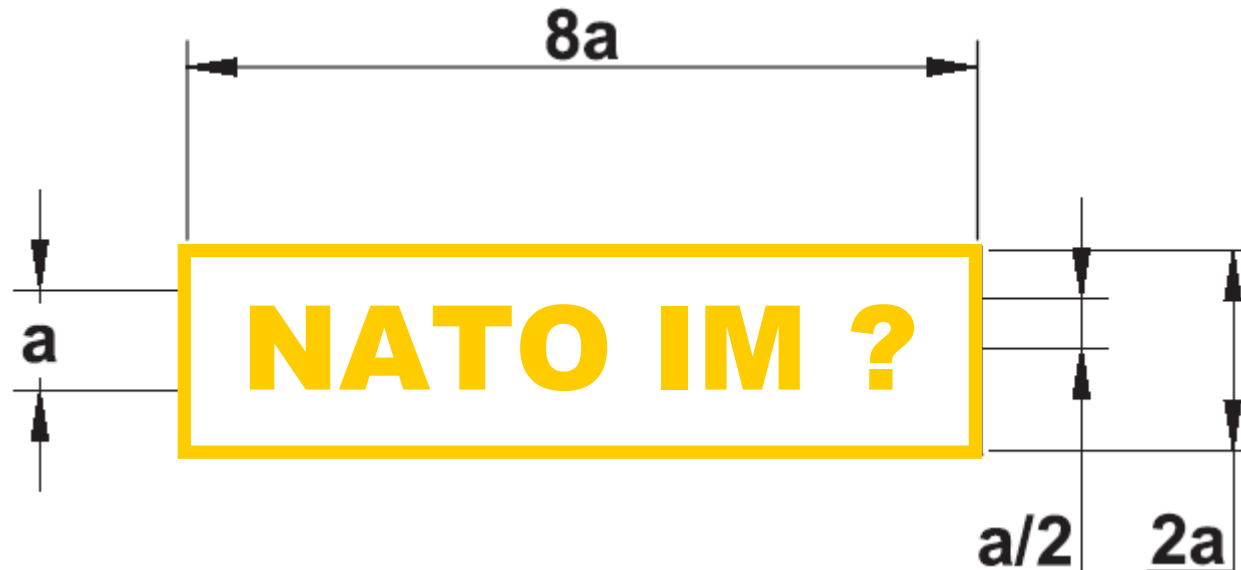
- IM definition remains national:
 - **Threat Hazard Analysis can banish tests listed in STANAG 4439**
 - **National waivers systems do exist**
- e.g: difficulties to achieve:
 - **Type V reaction in slow cook-off for rocket motors**

4. Classification of IM: a complex issue

SSD 1.2.3 can make IM visible, but:

- Sub Division not applicable for transport
- Ammunition packaging remains marked HD 1.2

⇒ **Shall NATO adopt a specific, visible label for SSD 1.2.3 ammunition ?**



5. QD's assessment using current Quantity Distance criteria [1/2]



(Toulon naval dockyard, France)

Scenario 1:

- Open storage of 500 M107 HE artillery projectiles
 - Individual NEQ of 10kg
 - Total quantity of explosive: 5000kg
 - Unbarricaded conditions
 - Temporary storage during ship loading

IBD for H.D. 1.1:

NATO: 400m

France: 376m

UK: 400m

USA: 381m

IBD for IM:

**NATO/ UK/USA:
122m**

France: 267m

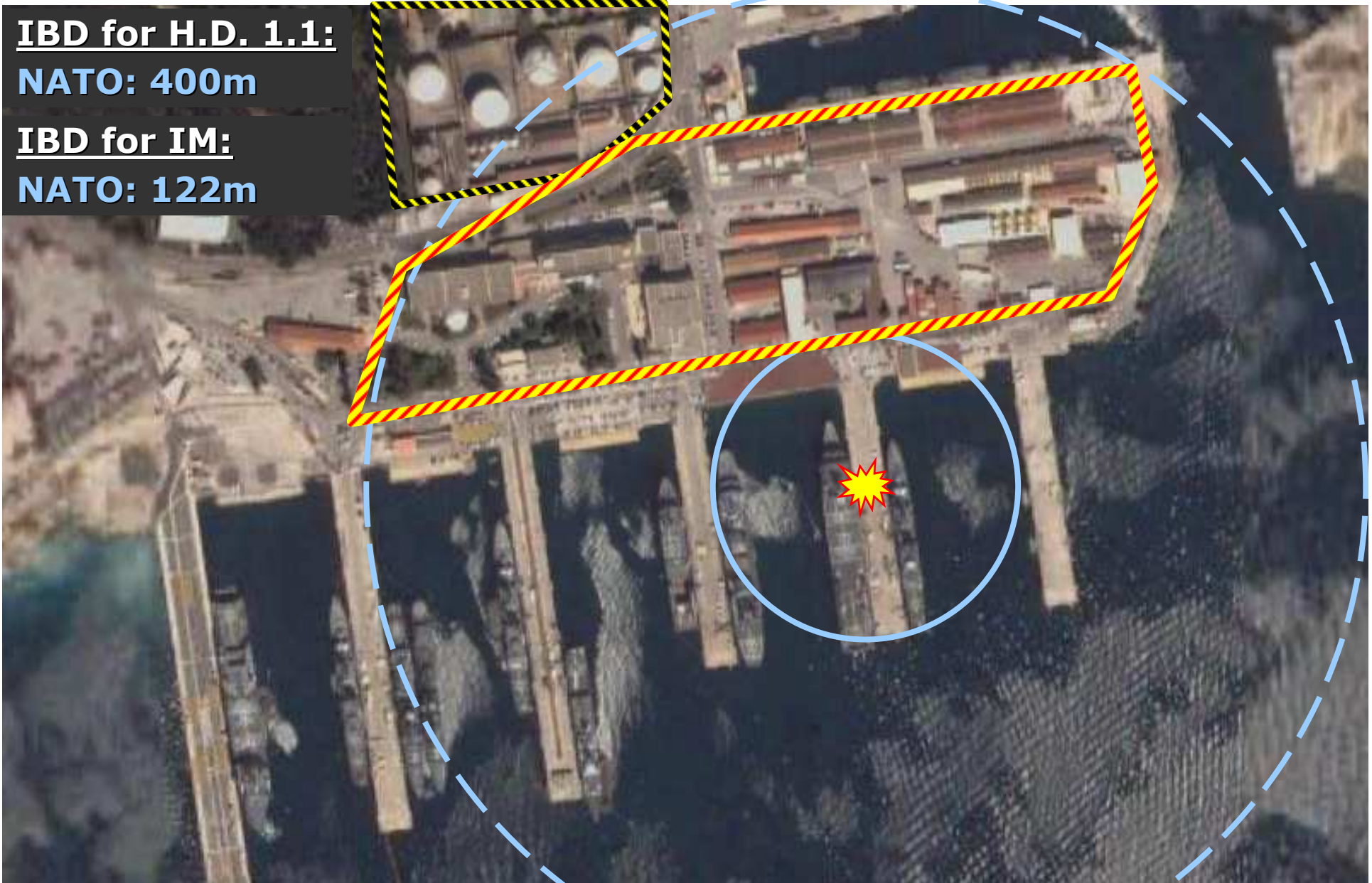


IBD for H.D. 1.1:

NATO: 400m

IBD for IM:

NATO: 122m



5. QD's assessment using current Quantity Distance criteria [2/2]



(Kirkuk airbase, Iraq)

Scenario 2:

- Open storage of 83 Mk82 type bombs
 - Individual NEQ of 120kg
 - total quantity of explosive : 9960kg
 - Unbarricaded condition
 - Field storage on an airbase

IBD for H.D. 1.1:
NATO: 480m
France: 473m
UK: 480m
USA: 381m

IBD for IM:
NATO/USA/UK: 214m
France: 400m

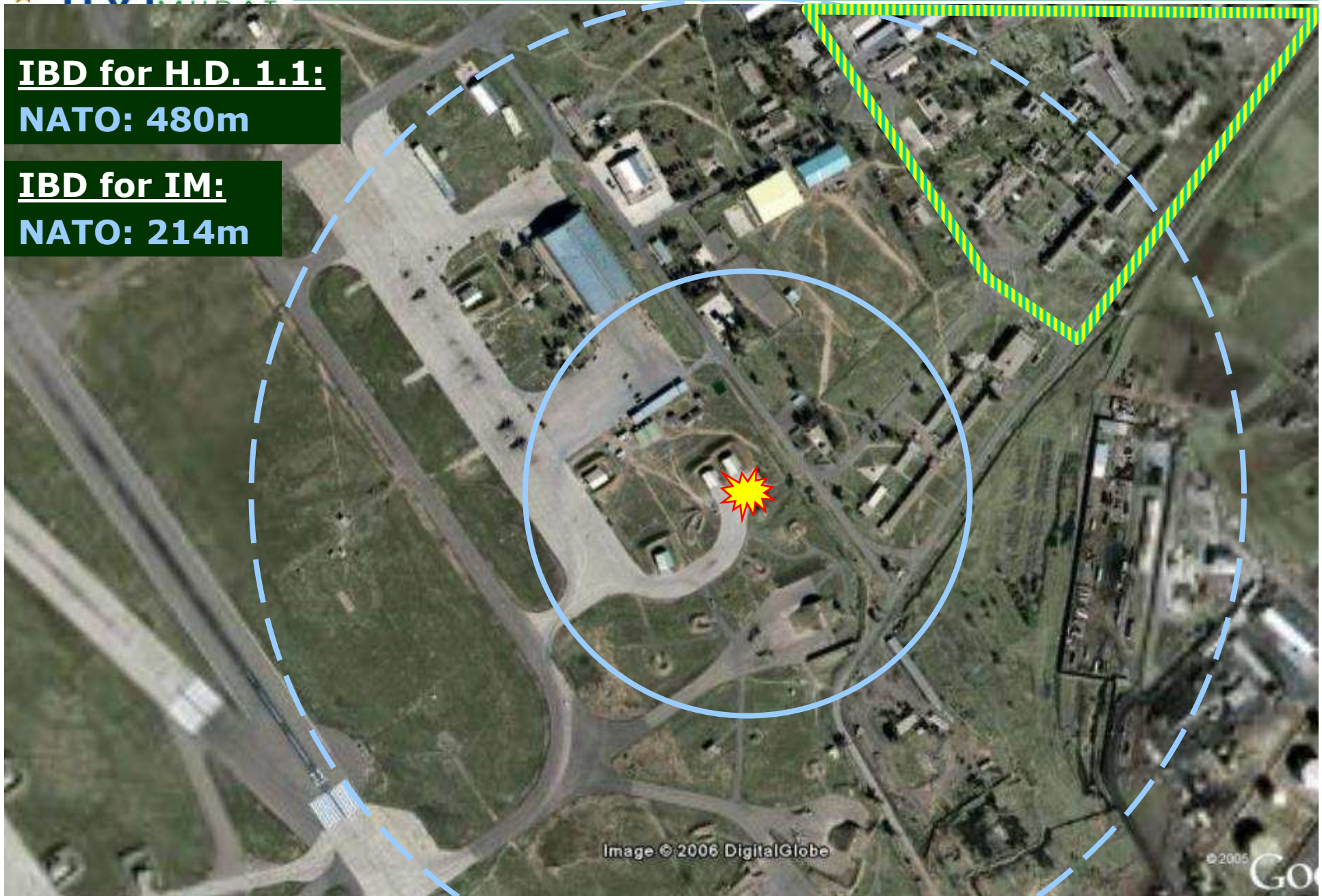


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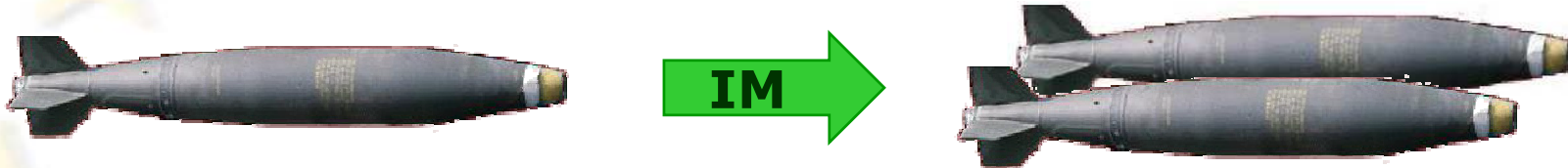
**IBD for H.D. 1.1:
NATO: 480m**

**IBD for IM:
NATO: 214m**



6. Benefits by use of IM [1/2]

- Additional quantity of IM stored within the same safety distances.



- Reduced storage areas and less storage magazines for the same quantity of munitions



6. Benefits by use of IM [2/2]

- Reduced number of security personnel to guard the same quantity of munitions.



- Safer Deployment: ammunition storage less vulnerable to accident or terrorist attack



Kirkuk ammunition storage,
june 2004

Insensitive Munitions



Q/D reduction



Logistic benefits and safety constraints reductions



Costs savings



but

IM compliance is still a domestic assessment

Methodologies to determine gains with IM still do need on-going efforts among NATO Nations for a more common and shared approach.