

Lettre du



MSIAC

Munitions Safety Information Analysis Center

Newsletter



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CLARIFYING NATO STANDARDS

MSIAC has received a number of questions over the years on the benefits of storing munitions with reduced hazard classifications. This is often connected with attempts to quantify the benefits of implementing Insensitive Munition policy. A recent question probed the benefits of NATO's storage sub divisions associated with HD 1.2 and the impact that these have on quantity distances.

Hazard Division 1.2 items are substances and articles which pose a projection hazard, but no mass explosion hazard. NATO uses the storage sub divisions 1.2.1, 1.2.2 and 1.2.3 to categorise the relative hazards posed by such explosive articles and allow for more appropriate quantity-distance calculations.

Definition of the Storage sub-Divisions (SsD)

SsD 1.2.1 are those items which pose a significant projection hazard of considerable range, and is defined as those HD 1.2 items with an NEQ1 greater than 0.73kg. These items are generally HE projectiles with or without attached propelling or pyrotechnic charges. Such SsD 1.2.1 items may explode during an accident, but will rarely detonate (will not propagate to a mass event). The fragments generated are relatively larger in size and of lower velocity. As a result, these projectiles can be projected further than the smaller fragments produced in a full detonation characteristics of a HD 1.1 item.

SsD 1.2.2 items are those that pose a reduced projection hazard with moderate fragment size and throw range. SsD 1.2.2 items are defined as those items with an individual NEQ less than or equal to 0.73 kg, and other items not containing HE such as cartridges, rounds with inert projectiles, pyrotechnic items or rocket motors. Tests have shown that such items generally produce fragments and

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lobbed projectiles with a range significantly less than SsD 1.2.1 items and thus reduced Quantity Distances (QD) can be used.

It is important not to dwell on the significance of the value of 0.73 kg used to differentiate between SsD 1.2.1 and SsD 1.2.2 items. This value was arrived at by analysing the test results used to develop the HD 1.2 QD relationships and the NEQ of the representative rounds tested. If comprehensive test data is available for a particular item, then the item may be placed in the most suitable category of HD 1.2 and the Quantity Distances calculations adjusted as appropriate.

SsD 1.2.3 is used to classify insensitive items that still pose a projection hazard, but at most exhibit an explosion reaction (Type III) in sympathetic reaction testing as per STANAG 4396 and a burning reaction (Type V) in bullet impact, slow heating, and liquid fuel / external fire testing as detailed in STANAGs 4241, 4382 and 4240. These items may have an NEQ in excess of 0.73kg. Examples of items include the Storm Shadow cruise missile, AGM-158 JASSM, a few Practice Bombs and some Explosive Reactive Armour (ERA) tiles.

¹An important note on definitions NEQ, NEW, and NEM

All three acronyms include propellant.

Net Explosive Mass (NEM) is the term used for transportation purposes. The total calculation of NEM includes all explosive substances and explosive articles regardless if testing approves a different value to be used for storage purposes.

Net Explosive Quantity (NEQ) is equal to NEM minus substances such as white phosphorus, chemical agents, smoke or incendiary compositions unless those substances have been shown (e.g. by testing) to contribute significantly to the explosion hazard.

Net Explosive Weight (NEW) is a term occasionally seen in Allied Publications, but is often used in the United States. NEW is synonymous with the NATO acronym NEM used for transportation purposes, but it expresses the total mass of explosive weight in pounds. The U.S. acronym equivalency for NEQ is Net Explosive Weight Quantity Distance (NEWQD). However NEWQD includes all explosive substances, i.e., high explosives, propellants, pyrotechnic compositions, unless testing has been conducted and the results support a different value.

Quantity Distance Benefits

For HD 1.2 items, if either the Potential explosion Site (PES), ammunition storage location, or the Exposed site (ES), situation exposed to explosive effects, is an earth covered building or one which can contain or resist the effects generated in an explosion of HD 1.2. items then, in general, no Q-Ds are necessary. However for public traffic routes and inhabited buildings, fixed distances of 30m for ammunition SsD 1.2.2 and 60m for SsD 1.2.1 are the NATO minimum separation distances standards. These QD distances are based on providing an acceptable level of risk from the primary hazards such as firebrands, large low-velocity fragments and lobbed ammunition.

What is most interesting about the QD calculation examples below are the extent to which the QD for SsD 1.2.3 items can vary against the 1.2.1 and 1.2.2 distances based on the ES structure types and quantities of explosives involved. This is shown to great effect by the example of 50,000kg stored in an earth covered PES, with no directional effects to an exposed Inhabited Building Distance (IBD). For SsD 1.2.1 and 1.2.2 items, this QD is extremely small, 60m/30m. The assumption is that tests have proven that the earth covered building will trap all primary, high velocity fragments plus lobbed items. The small IBD is associated more with potential fragments from any structure break-up (secondary fragments) than from any direct munitions effect. The QD for SsD 1.2.3 items is to be calculated (as per AASTP-1 para 1.3.1.5.j) using the D4 QD formula for HD 1.3 items: for 50,000kg this distance is 240m. However because the PES is an earth covered structure it is assumed that all the fragments will be interrupted and thus treated the same as the SsD 1.2.1 / 1.2.2 items, with the 60m/30m IBD. However if the 1.2.3 items were stored in the open or in a structure that cannot "interrupt" primary fragments as seen in the last example below, the SsD 1.2.3 items, which have passed the relevant IM tests, now requires more safe separation distance, hence considered more hazardous.

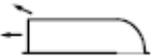
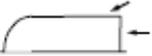
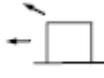
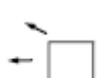
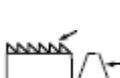
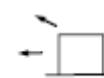
The standard appears to take into account the mass fire hazard posed by a large quantity of items prone to burn (SsD 1.2.3) as opposed to explode/burst (SsD 1.2.1 / 1.2.2). The earth covered building is assumed to be able to capture the fragments thrown by such explosions, but respects the high radiant heat generated by a large propellant driven fire. Although SsD 1.2.3 items have responded well to both the sympathetic reaction and fast cook-off tests, their safe separation distances according to the current guidance in AASTP-1 may be larger than those of 1.2.2 which have not passed the same tests mentioned.

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SsD 1.2.3 items are much more likely to have only one or two items in a stack react at anyone time, and are more likely to produce a smaller reaction over a longer period of time than the other HD 1.2 sub-divisions. Such a scenario where only a part of the stack reacts at any one time is known as the Maximum Credible Event (MCE). The concept of using MCE as opposed to total NEQ of a stack/building to calculate the QD has not yet been approved for use in AASTP-1, but will likely be achieved in the next edition. If that were to happen, the MCE for SsD 1.2.3 items could be as low as the NEQ of the single largest NEQ item in the PES. This would reduce the QD for SsD 1.2.3 items considerably thereby permitting more munitions to be stored in existing locations, or reduce the footprint required when planning future storage facilities.

Example: QD Calculations for Hazard Division 1.2

Potential Explosion Site (PES)	Exposed Site (ES)	NEQ [kg]	SsD 1.2.1 [m]	SsD 1.2.2 [m]	SsD 1.2.3 [m]
Earth covered building - Directional effects towards ES 	Earth covered building - Door facing Effects 	70,000	col. D6 305m	col. D5 135m	178m ₁
Earth covered building - Directional effects towards ES 	Open stack, un-barricaded 	20,000	Col. D6 275m	Col. D5 110m	117m ₁
Earth covered building - Directional effects towards ES 	Workshop, no protective roof, barricaded 	4,000	Col. D4 120m	Col. D3 43m	<0.73kg, 38m ₂ >0.73kg, 92m ₂
Earth covered building – effects away from ES 	IBD – Occupied Housing 	50,000	60m	30m	<0.73kg, 60m >0.73kg, 30m
Open stack 	Workshop, un-barricaded 	4,000	col. D6 220m	col. D5 80m	<0.73kg, 71m >0.73kg, 92m
Open stack 	IBD – Occupied Housing 	50,000	col. D2 445m	col. D1 190m	HD 1.3 / D4 240m

¹ Intermagazine distance equals 67 percent of IBD (Col D4 of Annex 1-A, Table 3G).

² Workshop distance equals 36 percent of IBD with minimum of 31m and 92m respectively (Col D4 of Annex 1-A, Table 3G).

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References

- a. NATO Publication AASTP-1 (Ed1 Chge3) Manual Of NATO Safety Principles For The Storage Of Military Ammunition And Explosives
- b. NATO Publication AOP-38 Specialist Glossary Of Terms And Definitions On Ammunition Safety
- c. NATO Publication AASTP-2 Manual Of NATO Safety Principles For The Transport Of Military Ammunition And Explosives
- d. NATO Publication AASTP-3 Manual Of NATO Safety Principles For The Hazard Classification of Military Ammunition and Explosives

In summary, SsDs for HD 1.2. offer additional granularity and do allow one to better manage the risk. However, there appears to be some remaining issues or inconsistencies with the QDs derived using the current rules, which can lead to SsD 1.2.3 munitions being treated more conservatively or equivalent to SsD 1.2.1 and 1.2.2. As a consequence, storage benefits from the introduction of Insensitive Munitions may not be fully realised. Despite this, moving from a HD 1.1. to HD 1.2. classification still offers significant benefits in terms of reduced QDs.

Note: *Lieutenant Christopher McGregor of the Royal Australian Navy assisted MSIAC by researching this topic.*

TRAINING TO NATO STANDARDS

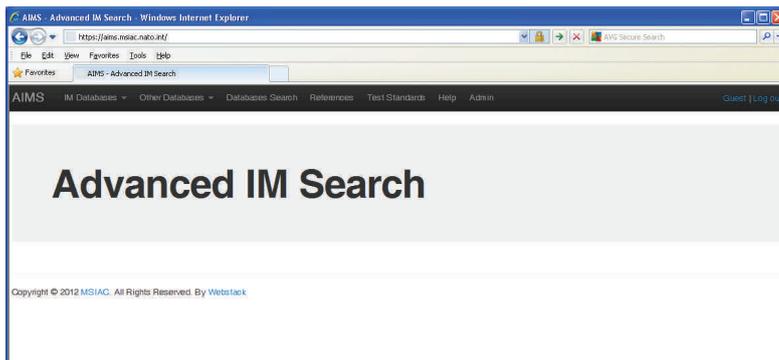
MSIAC orchestrated a training session on 3-7 September 2012 in Brussels for the Belgian Ministry of Defence. Budget cuts and personnel shortfalls in the Belgian MOD prompted an urgent request for MSIAC to teach the NATO Ammunition Storage Standards AASTP-1 and AASTP-5. The 40-hour training course was developed specifically to train approximately ten Belgian ammunition technicians on the NATO standards. However, the classroom could accommodate more students therefore additional space (seven seats) was available for other MSIAC Member Nations. An invitation was sent to all MSIAC Member Nations interested to attend. Seven additional students from other nations (1 from Australia, 1 from France, 1 from Germany, 2 from the Netherlands, and 2 from USA) attended along with the ten students from Belgium. The training was presented on MSIAC's behalf by a former Belgian MOD Ammunition Technical Officer and instructor, Mr. Johann DeRoos. The presentation thoroughly covered all aspects of the standards, but also included practical exercises on barricades and Quantity Distance plus a final examination was given on the last day of the course. All students succeeded and were awarded a signed certificate of completion. Positive feedback on the course material and presentation was overwhelming. A second course in Versailles, France in 2013 is pending further negotiations.

The course slide presentation, exercises and instructor notes are on the MSIAC Weblink for downloading by Member Nations.



ADVANCED IM SEARCH (AIMS)

As already described in the previous Newsletter, MSIAC is developing a new platform to access and search for IM test results. This platform is called AIMS (Advanced IM Search).



Thanks to the web environment, this new tool:

- ⇒ is available on-line and always the latest version
- ⇒ provides a unique and powerful search engine to look into all databases
- ⇒ is more intuitive than the excel spreadsheets
- ⇒ provides more information on the munitions and the test results

AIMS compiles data from over 500 publications, comprises more than 5,500 test results and allows one to look through the six threats at the same time:

SCJ Test		Tested Item Characteristics					Mitigation	Test Setup			Results		Ref
ID	Munition (Tested Item)	Energetic Material	Composition	External Diameter/ Thickness (mm)	Case Material and Thickness (mm)	Pack.	Material / Concept / Thickness (mm)	SC Name (Caliber)	Jet Tip Velocity (km/s)	V _D (mm ² /μs ²)	Reaction Type	Initiation Mechanism	Ref
3394	155 mm LU211-M Shell (Warhead)	XF-13333	48% NTO 31% TNT 14% Al 7% Wax	155	Steel	Base	None	Flexible Linear SC			NR	.SDT	16 49

ACCESS TO THE PLATFORM AND ON-GOING WORK

So far, BIRD (Bullet Impact), SYR (Sympathetic Reaction), FRAID (Fragment Impact) and DARTS (Shaped Charge Jet) have been migrated to the AIMS platform. AIMS is available on a secure MSIAC server at <https://aims.msiac.nato.int/>. Login and password are the same as for the other MSIAC applications.

Work is on-going to migrate the two other databases; HEAT Slow Cook-Off and HEAT Fast Cook-Off. The final version should be available in January 2013.

The platform is still under development and all comments regarding bugs, missing features, required or superfluous criteria, display improvements, etc are more than welcome and will help us to make this product better for you. We acknowledge the beta testers who have provided some useful comments and feedbacks and we would like to encourage all users to do the same.

MSIAC STEERING COMMITTEE IN SPAIN

In October the Steering Committee had their meeting in the beautifully situated central campus of the Marañosa Technical Institute. The facilities are exceptional and they were able to visit the excellent museum with its exhibition of weapons and munitions and the newly established test facilities .

We would like to thank the hosts for their hospitality.



THE MARAÑOSA TECHNOLOGICAL INSTITUTE (ITM)

Centre of R&T of the Spanish Ministry of Defence

For further information do not hesitate to contact ITM at itm@oc.mde.es

The **ITM (The Marañosa Technological Institute)** is the technological reference institution for Defence Research and Development in Spain that belongs to the Spanish Ministry of Defence and encompasses seven different activity areas: armament, electronics, metrology, CBN (Nuclear, Biological and Chemical) & materials, optronics & acoustics, military vehicles and ICTs (Information and Communication Technologies).

INSTITUTE LOCATION

There are three facilities belonging to the ITM, located each of them in a different place across Spain:

The **Central Campus**, in San Martín de la Vega, inside the Madrid South-East Regional Park.

“**Torregorda**” **Firing Range**, inside the Natural Bay Park in Cádiz.

Radioelectric Test & Analysis Center, in Guadalajara.

The **Central Campus** is situated in the middle of the **Madrid South-East Regional Park** inside the **Marañosa estate**, which has an extension of more than 700 hectares (two thirds of it are part of a natural reserve), where it benefits from its proximity to Madrid, which is the hub for an increasing industrial development, including important Defence companies, and has an excellent transportation network by land, railway and air (through Barajas and Torrejon airports). In this outstanding situation, the Marañosa Technological Institute is strongly involved in the **conservation and improvement of the environment**.



For more details please see article in our Newsletter of the 1st Quarter 2010.

“The value of serving ... and innovating”.

LATEST PATENTS OF INTEREST



US008282749B1

(12) **United States Patent** (10) **Patent No.:** **US 8,282,749 B1**
Sabatini et al. (45) **Date of Patent:** **Oct. 9, 2012**

(54) **GREEN LIGHT EMITTING PYROTECHNIC COMPOSITIONS**

(75) **Inventors:** **Jesse J. Sabatini**, Denville, NJ (US); **Jay C. Poret**, Sparta, NJ (US); **Russell N. Broad**, Passaic, NJ (US)

(73) **Assignee:** **The United States of America as Represented by the Secretary of the Army**, Washington, DC (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) **Appl. No.:** **13/155,480**

(22) **Filed:** **Jun. 8, 2011**

(51) **Int. Cl.**
C06B 43/00 (2006.01)
C06B 33/00 (2006.01)
D03D 23/00 (2006.01)
D03D 43/00 (2006.01)

(52) **U.S. CL.** 149/22; 149/37; 149/109.2; 149/109.4

(58) **Field of Classification Search** 149/22, 149/37, 109.2, 109.4
 See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,507,719 A *	4/1970	Hodgson	149/6
3,963,542 A *	6/1976	Pilipovich	149/19.3
6,427,599 B1 *	8/2002	Posson et al.	102/336
2009/0320975 A1 *	12/2009	Shortridge et al.	149/20

* cited by examiner

Primary Examiner — James McDonough

(74) *Attorney, Agent, or Firm* — Henry S. Goldfine

(57) **ABSTRACT**

Boron-containing, green light emitting pyrotechnic compositions that advantageously do not include barium, perchlorate or chlorinated organic compounds.

13 Claims, 2 Drawing Sheets

<http://www.patentstorm.us/patents/7472653/fulltext.html>

All kinds of energetic materials and ordnance containing perchlorates and heavy metals come under increased scrutiny in the United States. Hence the Services are taking great efforts to render their stores greener in order to reduce the ecological footprint.

In this context the most recent disclosure by a Picatinny Arsenal (US Army RDECOM-ARDEC) Research-team led by PhD-chemist Jesse J Sabatini is a real breakthrough in the development of pyrotechnics, which are less objectionable from both environmental and occupational health point of view.

Sabatini et al. have discovered that cheap and non-toxic boron carbide, B₄C, (a material hitherto only used in ballistic armour) when used as fine powder can act as a high energy fuel and replace both poisonous barium nitrate and noxious perchlorate from common Army green signal flare compositions such as those used in the M125A1 Hand-held Signal Flare.

Not only does the new formulation yield reduced smoke emission it also is less sensitive to friction and impact stimuli than prior formulations thus making both production and use of these pyrotechnic devices more safe.

More technical details underlying this disclosure can be found here:

<http://onlinelibrary.wiley.com/doi/10.1002/anie.201007827/abstract>

PROCUREMENT ISSUES PRESS REVIEW

If you have information you consider of relevance to this section please do not hesitate to contact MSIAC at info@msiac.nato.int

ATK AWARDED \$32 MILLION CONTRACT TO DELIVER 30MM TACTICAL AND TRAINING AMMUNITION TO THE UNITED STATES AIR FORCE

17 October 2012

ATK announced today that the United States Air Force awarded the company a \$32 million contract to produce 30mm tactical (PGU-13) and training (PGU-15) ammunition. The ammunition is used by the U.S. Air Force's A-10 Thunderbolt cannon.

<http://atk.mediaroom.com/2012-10-17-ATK-Awarded-32-Million-Contract-to-Deliver-30mm-Tactical-and-Training-Ammunition-to-the-United-States-Air-Force>

ATK AWARDED CONTRACT FOR FMU-143 BOMB FUZE; INITIAL ORDERS VALUED AT \$52 MILLION

23 October 2012

ATK has been awarded a contract as the prime contractor, teaming with L-3 Fuzing and Ordnance Systems with an \$84 million ceiling for Testing and production of the FMU-143 Bomb Fuze for the U.S. Air Force and Navy.

The FMU-143 is used on penetrating weapons such as the BLU-109 and BLU-113 for the defeat of hard and deeply buried enemy targets. These weapons are designed with technology that enables them to stay intact upon impact and penetrate deep into the interior of hardened sites, where the FMU-143 provides a delayed detonation to ensure a more complete destruction of the hardened target.

"ATK is proud to add this product to our portfolio of fuzing for defeat of hard and deeply buried targets," said Dave Fine, Vice President for ATK's Fuzing and Warheads Market Segment. "The FMU-143 is the only qualified production fuze for use in today's hard target defeat weapon systems. This complements our lead role in the development of next-generation hard target defeat fuzing systems, established through our earlier win of the FMU-167 Hard Target Void Sensing Fuze program."

Production of the FMU-143 will occur at the L-3 FOS facility in Cincinnati and the Allegany Ballistics Laboratory (ABL) facility in Rocket Center, W.Va. ABL is a U.S. Navy-owned, ATK-operated facility specializing in advanced manufacturing technologies for a variety of programs supporting current and future U.S. industrial base needs in advanced fuzing and integration, conventional munitions assemblies, solid rocket motor propulsion, and advanced material structures.

<http://atk.mediaroom.com/2012-10-23-ATK-Awarded-Testing-and-Production-Contract-for-FMU-143-Bomb-Fuze>

LOCKHEED MARTIN RECEIVES \$34 MILLION CONTRACT FOR PAVEWAY II PLUS LASER GUIDED BOMB KITS

17 October 2012

Lockheed Martin received a \$34.1 million contract from the U.S. Air Force for follow-on production of Paveway II Plus Laser Guided Bomb (LGB) GBU-10, GBU-12 and GBU-16 guidance kits. With this contract, Lockheed Martin received the majority share of a \$56 million paveway II Plus LGB procurement. Production is expected to begin in early 2014. The contract is part of an overall \$475 million five-year, firm-fixed-price, multiple-award contract announced by the U.S. Air Force in August 2011.

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Under the contract, Lockheed Martin will build and deliver paveway II Plus LGB kits, consisting of MAU-209C/B computer control groups that contain the electronic guidance system and the associated air foil groups that provide lift and stability to the weapons, in standard GBU-10 MK-84 (2,000 lb.), GBU-12 MK-82 (500 lb.), GBU-16 MK-83 (1,000 lb.) series configurations. Lockheed Martin is a qualified provider of all three variants of paveway II MK-80 series LGBs, and is the sole provider of the paveway II Enhanced Laser Guided Training Round and Dual Mode Laser Guided Bomb. Lockheed Martin has delivered more than 65,000 LGB kits to the U.S. Air Force, U.S. Navy and international customers.

US ARMY, AND OTHERS, PLACE ORDERS FOR SAAB'S CARL-GUSTAF

26 September 2012

Saab has signed a new contract with the U.S. Army for the company's Carl-Gustaf man-portable weapon system. This marks the second time the U.S. Army has bought the 84mm recoilless rifle system to equip its forces. The total order value is \$31 million (approximately MSEK 205).

Long in service with U.S. Special Operations Forces, the system has only recently been taken into service by the U.S. Army for its regular infantry units as well.

"The fact that the U.S. Army continues its plans to deploy this game-changing weapon system to its main-line units speaks for itself. The Carl-Gustaf has repeatedly proven itself in the most demanding environments and it is a versatile, powerful tool for the soldier", said Saab North America President, Dan-Åke Enstedt.

And in a separate order announced 31 October 2012 Press Release, Saab have signed an additional contract on further deliveries of components for the Carl-Gustaf man-portable weapon system. The order has a total value of MSEK 313 and comprises components for ammunition to the latest version of the Carl-Gustaf system. This contract also contains options for further orders of about MSEK 150 for deliveries to take place during 2012-2013.

<http://www.saabgroup.com/en/About-Saab/Newsroom/Press-releases--News/2012---9/US-Army-Places-New-Orders-for-Saabs-Carl-Gustaf/>

<http://www.saabgroup.com/en/About-Saab/Newsroom/Press-releases--News/2012---10/New-order-for-Saabs-Carl-Gustaf1/>

CHEMRING ORDNANCE AWARDED OPTION FOR APOBS PRODUCTION

28 August 2012

Chemring Ordnance, Inc. has been awarded \$40.4M by the US Army for the MK7 MOD 2 Anti-Personnel Obstacle Breaching System (APOBS). This was an option on an existing APOBS contract awarded in June 2012. The APOBS is a self-contained, one-shot, expendable linear demolition charge which can be transported and deployed by a two-person team, and is capable of safely clearing a footpath through anti-personnel mines and multi-strand wire obstacles. Keith Funkhouser, President of Chemring Ordnance, stated that, "This APOBS option award includes the manufacturing of rocket motor propellant grains in the USA. This is an exciting new business segment for Chemring Ordnance that we believe has great potential in the future. We are delighted in the US Army's continued confidence in Chemring to provide protection for their soldiers and marines."

<http://www.chemring.co.uk/media/press-releases/2012/2012-08-28b.aspx>

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THE CARLYLE GROUP ANNOUNCES IT DOES NOT INTEND TO MAKE AN OFFER FOR PURCHASE OF CHEMRING

07 November 2012

Chemring Group PLC notes today's announcement by The Carlyle Group that it does not intend to make an offer for the Company. On 17 August 2012 Chemring announced that it had received a highly preliminary expression of interest from The Carlyle Group in relation to a possible offer for the Company. Carlyle was required by Rule Code to announce a firm intention to make an offer for Chemring by 14 September 2012. At the request of the Company, the Panel consented to an extension of this deadline on 14 September and again on 12 October, to enable the parties to continue their on-going discussions regarding a possible offer for the Company.

Whilst Chemring continues to face near term challenges resulting from defense budget constraints in its NATO markets, which are not expected to ease in the immediate future, the Company has market leading positions and manufacturing expertise in the fields of counter-IED, countermeasures, munitions and pyrotechnics. In addition, the Company's non-NATO markets will continue to provide the business with further opportunities and gives a balanced exposure to global defense spending.

<http://www.chemring.co.uk/media/press-releases/2012/2012-11-07.aspx>

PARS 3LR GUIDED MISSILE READY FOR PRODUCTION SERIES START

10 August 2012 | Diehl Defence

The successful conclusion of the PARS 3LR guided missile's release firings fulfilled an important prerequisite for the series production of the German TIGER helicopter's main armament.



A direct hit of the target moving between two house walls marked the conclusion of a challenging firing campaign. The firing from the support helicopter TIGER took place on September 20, 2012 at the Defence Technology Center 91 in Meppen.

Following the formal approval by the German Armed Forces, the manufacture of all 680 guided missiles agreed to in the contract with the prime contractor PARSYS GmbH can begin. The program company PARSYS GmbH is a joint venture of Diehl and MBDA Deutschland. Diehl Defence supplies the guided missile's image-processing target seeker head.

PARS 3LR is a fire & forget guided missile system capable of engaging different targets. Emerging from its safe cover for only a few seconds during the firing process, the helicopter is capable of engaging several targets simultaneously in salvo firing. The far-ranging missile pursues and engages targets autonomously, while the helicopter can change its position or pursue other mission objectives. PARS 3LR features a unique system enhancing the German Armed Forces' capability to prevail and survive.

<http://www.diehl.com/en/nc/diehl-defence/press/armament-for-tiger-helicopter-ready-for-series-start/6.html>

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GENERAL DYNAMICS AND U.S. ARMY ARDEC DEMONSTRATE LOW-COST PRECISION STRIKE CAPABILITY FOR TACTICAL UAVS

1 November 2012

General Dynamics Ordnance and Tactical Systems and the U.S. Army Armament Research and Development Engineering Center (ARDEC) have successfully demonstrated a GPS-guided munition for use on small Unmanned Aerial Vehicles (UAV). The testing consisted of engagements using a Tiger Shark UAV launching an 81mm mortar equipped with General Dynamics' Roll Control Fixed Canard control system and an ARDEC-developed fuzing solution. All three mortars were launched from a UAV at altitudes of approximately 7,000 ft and guided to within seven meters of a GPS-identified target grid.

"This effort demonstrated a low-cost, tactical version of a GPS strike weapon for UAV platforms," said Mark Schneider, general manager of General Dynamics Ordnance and Tactical Systems' Seattle operations. "Together with ARDEC, we have demonstrated a weapon in the 10-pound class for tactical UAVs that can be used to quickly engage and defeat targets. Advancements in GPS targeting and data-link technology provide a built-in growth path for this demonstrated technology."

"The Air Drop Mortar (ADM) program with General Dynamics provided a platform to successfully demonstrate and mature subsystems including communication links, munition deployment, guidance and control and fuzing," said Tony Sebasto, senior associate for Munitions at ARDEC. "The utilization of existing mortar production components, along with demonstrated guidance and control and fuzing, gives the U.S. warfighter an option for a very affordable and very capable precision strike weapon."

The ADM uses existing mortar inventory to provide a low-cost, lightweight weapon system with proven energetics. The General Dynamics' patented Roll Controlled Fixed Canard (RCFC) guidance kit, with an innovative flight-control and GPS-based guidance and navigational system adds precision-strike capability to existing mortars. The nose-mounted guidance kit replaces existing mortar fuzes and has been successfully demonstrated on multiple mortar calibers in both air-drop and tube-launch applications. The kit provides a common, multi-platform Guidance, Navigation and Control (GNC) and integrated weapon system for unmanned aircraft.

http://www.generaldynamics.com/news/press-releases/detail.cfm?customer_dataPageID_1811=18078

PYROS AIMS TO BRING NEW ACCURACY TO UNMANNED MINI-AIRCRAFT

7 August 2012

The July 18 test at the Army's Yuma Proving Ground in Arizona marked the first live-fire test of the Pyros, a tiny, laser- and satellite-guided bomb that developers are hoping will allow new, smaller unmanned aircraft to carry out precision strikes while sparing civilians. The Pyros is formally known as the Small Tactical Munition.



The test simulated insurgents planting a roadside bomb, and it used the Pyros' sophisticated height-of-burst sensor to explode just before hitting the target. Testing validated the weapon's guidance modes – both semi-active laser and the satellite-based global positioning system – as well as the height-of-burst sensor, electronic safe-and-arm device and multi-effects warhead.

The test used a Cobra unmanned aerial system, a 9.3-foot-long aircraft with a wingspan of only 10 feet. At 13.5 pounds, the 22-inch-long guided bomb no

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bigger than a rolled-up movie poster and is small enough that two of them can fit in the U.S. military's common launch tube.

http://www.raytheon.com/newsroom/technology/rms12_pyro_8_7/index.html

BOEING CONDUCTS FIRST FLIGHT TEST OF THE CHAMP CYBER MISSILE

22 October 2012 at 21:24

A recent weapons flight test in the Utah desert may change future warfare after the missile successfully defeated electronic targets with little to no collateral damage.



Boeing and the U.S. Air Force Research Laboratory (AFRL) Directed Energy Directorate, Kirtland Air Force Base, N.M., successfully tested the Counter-electronics High-powered Microwave Advanced Missile Project (CHAMP) during a flight over the Utah Test and Training Range. The flight test demonstrated multi-shot and multi-target capability of the aerial HPM demonstrator, to degrade, damage, and destroy electronic systems.

The CHAMP high power microwave (HPM) aerial demonstrator is a multiyear, joint capability technology demonstration that includes ground and flight tests. CHAMP, which renders electronic targets useless, is a non-kinetic alternative to traditional explosive weapons that use the energy of motion to defeat a target.

During the test, the CHAMP missile navigated a pre-programmed flight plan and emitted bursts of high-powered energy, effectively knocking out the target's data and electronic subsystems. CHAMP allows for selective high-frequency radio wave strikes against numerous targets during a single mission.

"This technology marks a new era in modern-day warfare," said Keith Coleman, CHAMP program manager for Boeing Phantom Works. "In the near future, this technology may be used to render an enemy's electronic and data systems useless even before the first troops or aircraft arrive."

The \$39 million contract for the development and construction of five flight vehicles and a small HPM payload was awarded to Boeing in 2009. Under the 39 months program Boeing is building five aerial platforms.

http://defense-update.com/20121022_boeing_champ_cyber_missile.html

MBDA STARTS WORK ON FRENCH MUNITIONS DEMILITARISATION FACILITY

14 November 2012

On Wednesday, 14th November, Antoine Bouvier, the Chief Executive Officer of MBDA, laid the first stone of France's future demilitarization facility which is to be built at MBDA's Bourges Subdray site. Representatives from both the civil and military authorities were present at the event. Before the end of 2013, this facility will become operational at which point it will be capable of dismantling annually 2,500 tonnes of various types of sensitive munitions, notably missiles. It will permit the maximum recuperation of waste products which will be sorted, re-used or recycled in full accordance with French and European standards. Only those waste elements comprising energetic material will be incinerated in the thermic treatment unit.

This new complex weapons demilitarization capability will allow MBDA to extend its portfolio of activities and to offer to its military customer base, the full life cycle management of their products from conception through to

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destruction. Around 12 million euros are being invested in this activity which should create around 20 direct jobs at the Bourges Subdray site.

In constructing this facility, MBDA is responding to France's desire to establish an industrial capability for dismantling munitions at the end of their life and for this to be done on national territory in order to guarantee the protection of its product confidentiality while always respecting the safety and environmental norms linked with this activity. This commitment was underlined in a contract calling for the destruction of 36,000 complex munitions between now and 2017, a contract which was won by MBDA in November 2011 following a tender issued by NSPA (NATO Support Agency) at the request of the French Ministry of Defence.

<http://www.mbda-systems.com/mediagallery/#/news/2999>

NAMMO AND DUNARIT CORP. HAVE TODAY SIGNED A MEMORANDUM OF UNDERSTANDING (MOU) REGARDING COOPERATION FOR DEMILITARIZATION AND UTILIZATION IN BULGARIA

The Nammo Group, a European leader within industrial demilitarization of obsolete ammunition, and DUNARIT Corp., leading company in the Defense industry in Bulgaria with in-house demilitarization capabilities, have today signed a MOU regarding cooperation for demilitarization and utilization in Bulgaria.

Nammo's Demil Division is a business unit with 3 demilitarization subsidiaries in Europe. The Nammo Group has experience within demilitarization of complex ammunitions such as cluster ammunition, rockets, naval ordnance and aircraft bombs. DUNARIT Corp. participates in the utilizations processes in Bulgaria for demilitarization of surplus ammunitions.. A facility for thermal destruction of small caliber ammunitions and primers was commissioned in Dunarit in 2010. Both companies have agreed to share their knowledge and experience for safe and environmental friendly demilitarization and to join their capabilities and capacities in selected work areas for the benefit of the Bulgarian demilitarization program and other customer needs in Europe.

"Bulgaria is an interesting customer for our future business, and can also become a regional player for demilitarization for their neighbouring countries. In DUNARIT we have found an excellent partner to develop demilitarization projects, including both technical capabilities, knowledge and international certifications" says Reijo Bragberg, Executive Vice President of the Nammo Group.

<http://www.nammo.com/News/NAMMO-Group-and-DUNARIT-Corp-enter-cooperation-within-demilitarization/>

GENERAL DYNAMICS AND RHEINMETALL DEFENCE FORM TANK AMMUNITION JOINT VENTURE COMPANY

19 April 2012

General Dynamics Ordnance and Tactical Systems and Rheinmetall Defence have formed a tank ammunition joint venture company named Defense Munitions International, LLC (DMI). The new company will develop and market new and existing 120mm kinetic energy and multi-purpose cartridges. DMI combines the partners' full range of development, production and sales activities of 120mm tactical ammunition for main battle tanks. By combining their activities in DMI, the two partners aim to broaden their global market access, expand production efficiencies and selectively engage in joint development work.

This forward-looking joint venture is the culmination of the longstanding partnership between General Dynamics and Rheinmetall Defence. For over a decade the two companies have worked together on numerous 120mm ammunition projects, such as the development and production of the KEW-A1 and KEW-A2 advanced tungsten kinetic energy ammunition for Abram's users worldwide.

<http://www.gd-ots.com/News%20Release/2012/GDOTS-DMI-04-18-12.pdf>

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QATAR REQUESTS SALE OF PAC-3 MISSILES AND RELATED EQUIPMENT

7 November 2012

Qatar has requested the sale of 11 PATRIOT Configuration-3 Modernized Fire Units and associated equipment, parts, training and logistical support for an estimated cost of \$9.9 billion.

Qatar will use the Patriot Missile System to improve its missile defense capability, strengthen its homeland defense, and deter regional threats. The proposed sale will enhance Qatar's interoperability with the U.S. and its allies, making it a more valuable partner in an increasingly important area of the world. This proposed sale will contribute to the foreign policy and national security of the United States by improving the security of an important ally which has been, and continues to be, a force for political stability and economic progress in the Middle East. This sale is consistent with U.S. initiatives to provide key allies in the region with modern systems that will enhance interoperability with U.S. forces and increase security. The notice of a potential sale does not mean the sale has been concluded

http://www.deagel.com/news/FMS-Qatar-Requests-Sale-of-PAC-3-Missiles-and-Related-Equipment_n000010918.aspx

BOEING RECEIVES \$145.1M CONTRACT FROM US NAVY CONTRACT FOR SLAM ER AND HARPOON MISSILES

9 July 2012

Boeing received a firm-fixed-price contract from U.S. Naval Air Systems Command for the production of nearly 90 Harpoon Block II missiles and associated hardware for the U.S. and four foreign militaries. The \$145.1 million contract also includes exercise and test variants of the Standoff Land Attack Missile Expanded Response (SLAM ER). The missile deliveries are scheduled to run through December 2013. Boeing received a related weapons contract from the Navy in May to procure Harpoon and SLAM ER weapons system components for the U.S. and also supported foreign military sales for 12 countries.

Harpoon Block II missiles feature autonomous, all-weather, over-the-horizon capability and can execute missions against sea and land targets, including coastal defense sites, surface-to-air missile sites, exposed aircraft, port or industrial facilities, and ships in port. More than 600 ships, 180 submarines, 12 different types of aircraft and land-based launch vehicles carry Harpoon missiles. Boeing has delivered more than 7,300 Harpoon and Harpoon Block II missiles to the U.S. Navy and more than 30 international military customers since the inaugural Harpoon contract was awarded by Naval Air Systems Command on June 21, 1971. SLAM ER, a derivative of Harpoon, is an air-dropped surgical strike weapon against high-value land targets or ships at sea or in port. A highly accurate man-in-the-loop cruise missile, SLAM ER can be launched from a range of more than 150 nautical miles and is reprogrammable in flight.

	FCO	SCO	BI	FI	SD
SLAM-ER (PBXN-112)	BURN	BURN	DEFL	BURN	PASS

CONTACT INFORMATION

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ACCIDENTS REPORTING

14 June -16 October 2012

(Re-printed with the permission of ility engineering (www.saunalahti.fi/ility) from their Hazards Intelligence (Hint) Journal)

14 June - Namibia

120614-09 Near Rundu, Kaguni village. A 15-year-old boy died when a toy-like object he picked up in a mahangu [pearl millet] field exploded while he was playing with it. According to police in the region, the area where the deceased picked up the device was an old South African shooting range during the pre-independence era. Villagers told national media that movement is restricted in the area, because people fear stepping on unexploded ammunition. Twenty-two years after independence, huge quantities of unexploded shells, mines and ammunition still lying around in the former battleground areas.

22 June - China

120622-07 Hubei province. A truck exploded while travelling on an expressway in Hubei province, killing at least three people and injuring four others. Local police reported that the powerful blast caused a 5-metre-wide and 3.5-metre-deep hole in the road and damaged farm houses near the roadside. Pieces of the truck were blow 100 metres away in the explosion, according to witnesses. The driver was among the killed. An old couple were injured after the explosion damaged the farmhouse they were in and have been sent to hospital. Investigators said they have yet to determine the cause of the explosion. Some reports said the truck was licensed to transport explosives; others said it was not.



23 June - Sri Lanka

120623-01 Muhamalai. Three employees attached to the Halo Trust demining organizations were injured in an explosion in Muhamalai. An Army spokesman said the victims were involved in a demining operation in the area when the explosion occurred. Two females and a male were among the victims, and Jaffna Hospital sources said that one critically injured person was receiving treatment in the Intensive Care Unit.

Military sources said that the individuals were injured due to a grenade explosion and not a mine blast. It was said the grenade was covered by thick grass and its safety pin badly corroded. They said the de-miners may have accidentally removed the safety pin while prodding the earth.

25 June - Serbia

120625-05 Central Serbia, Lucani. A worker was lightly injured in an explosion around 09:00 at the Milan Blagojevic defence sector factory in Lucani, central Serbia. Eight workers were inside the premises at the time of the explosion, and all but one escaped unharmed. One worker sustained minor injuries and resumed his duties after receiving medical treatment.

The accident happened when a press used in the production of rocket fuel and artillery gunpowder exploded. This is described as "the most dangerous part of the production process", and for that reason the machine is operated remotely. The workers were therefore not physically present at the site of the explosion, which explains how they were able to escape the powerful explosion without sustaining major injuries.

26 June - Thailand

120626-05 Chanthaburi province, Chao Phraya Bodindecha Border Patrol Police camp. Fire destroyed an explosives depot at Chao Phraya Bod-indecha Border Patrol Police camp in the eastern province of Chanthaburi, damaging police housing. Only minor injuries were reported.

The fire began at 10:45 at the explosives depot in Chao Phraya Bodindecha camp, base of the Border Patrol Police Sub-Division 11, and explosions occurred five or six times as the flames touched off different munitions stores. Six fire engines rushed to the scene, but due to exploding ordnance had waited for their safety to douse the flames.

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Initial reports said that the fire broke out at a small depot housing rocket-propelled grenades, mortar shells, landmines, and small arms ammunition retrieved by Border Patrol Police Sub-Division 11 and bomb squads along the Thai-Cambodia border during and after the Indochina war. Some of the explosive devices were wait-listed for being destroyed. The cause of the fire was unknown. The Border Patrol Police gave no information to media who were not given access to cover the incident. The fire damaged 11 or 12 homes of police, while three or four police who sustained minor wounds from shrapnel on their arms and legs were hospitalised. The explosions ended at 23:40 pm, when fire-fighters and volunteers fully accessed the site, taking 20 minutes to end the fire.

27 June - USA

<http://www.youtube.com/watch?v=mt6hMMEU17Y> & <http://www.wpxi.com/news/news/local/explosion-reported-connellsville-paint-company/nPfz3/>

120627-02 PA, Connellsville. O.C. Lugo Co. Two employees were injured in an explosion while they were mixing chemicals at the O.C. Lugo company in Connellsville. City police Chief Jim Capitos said the two company employees were mixing red phosphorus and fibreglass powder in a litre container in their lab when the mixture exploded at 07:08. The man who was holding the container lost three fingers. Capitos said he was taken to UPMC Mercy in Pittsburgh by medical helicopter. The second victim was also taken to UPMC Mercy by medical helicopter because he was suffering from smoke inhalation and a ringing in his ears. According to Capitos, mixing red phosphorus and fibreglass powder is a routine step in mixing four chemicals to make chemical igniters for oxygen generators, used in Navy submarines. According to a March 13 news release from the Department of Defense, O.C. Lugo was awarded a one-year, \$15 million contract with the Navy to make chlorate candles and oxygen candle igniters used in oxygen generators.



Carnegie Mellon University chemical engineering professor Paul Sides said that mixing red phosphorus with fibreglass powder probably did not cause the explosion: "Something doesn't quite make sense. Something

else must have gone wrong".

Guy Napolillo, chief of the Fayette County Hazardous Materials Response team said: "A company representative told me that they were using a 50-year-old process to make these, and nothing like this has ever happened before. They still don't know exactly what happened. There's a million things that could have gone wrong from a contaminated chemical to static electricity." Napolillo said companies with certain quantities of semi-hazardous materials must provide the Fayette County Emergency Management Agency with a list of what is on the property. O.C. Lugo, however, did not have enough of any chemical to file a report.

1 July - USA

120701-03 VA, Radford. BAE Systems Inc. US Army. A chemical spill that continued for nearly two hours at the Radford Army Ammunition Plant injured one person and prompted management to shut down a key production line at the propellant facility. The injured worker was released from the hospital after being held for observation following exposure to fumes.

Virginia-based BAE Systems was in the first day of a newly awarded 10-year contract to operate the facility when an acid tank overheated and began leaking. Fumes and an ill-timed severe thunderstorm delayed efforts to stop it. It was unclear when the arsenal's nitrocellulose production plant, where the incident occurred, will resume operation. Army spokesman Steve Abney said repairs and cleanup were expected to take three weeks, but BAE released what it called a joint company-Army statement that said normal operations were expected to resume on July 3. He said the arsenal was open late on the afternoon of July 2, though access was limited to key personnel. BAE said that was a safety precaution.

Nitrocellulose is the precursor for many explosives and propellants, and the nitrocellulose line at the Radford arsenal is the only domestic producer. However, Abney said the Army has an inventory of the compound and could ride out the expected brief production loss. The nitrocellulose unit was shut down for routine maintenance at the time of the incident, but scheduled to reopen after July 4.

A statement by the Army said arsenal management first knew they had a problem when alarms sounded about 19:30 to indicate overheating of spent nitric acid tanks. Fire-fighters cooled several tanks with water, but one tank containing oleum [Fuming sulphuric acid, Ed.] continued to overheat and, four hours later at about 23:30, it sprung

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two leaks. The oleum fumes forced the base's onsite fire-fighting crew to retreat. Conditions for attacking the leak worsened further when, at about 00:15, the latest in a series of thunderstorms hit the area. Winds over 70 mph and rain kept fire-fighters and plant personnel from containing the spill. It was not until 01:20 that the tank stopped leaking.

3 July - Finland

120703-03-B Helsinki, Espoo, Matinkylä. Peab Oy. Peab Infra Oy. Eight people were injured by an explosion on a construction site next to the Iso Omena [Big Apple, Ed.] shopping centre in Espoo, a western suburb of Helsinki. The explosion was reported to the emergency services a little before noon. One person was seriously injured, and was taken to hospital for treatment. Flying rocks shattered glass in the Iso Omena mall's glass roof, prompting centre managers to evacuate shoppers.



Iso Omena's head of real estate, Esa Sihvonen, said that the company had to evacuate to ensure the roof sustained no lasting damage. Some parts of the centre remain closed. Fire-fighter Simo Hallio said that other buildings in the vicinity also had broken windows because of the explosion.

On July 4, Marko Kilpeläinen, safety manager of Peab, the company responsible for the construction in Espoo's Matinkylä where the explosion occurred, said that no plan for the explosions had been recovered, and that such a plan might not have been drawn up at all, adding: "It seems like something unpredictable or strange happened, or that there was some kind of negligence involved here." He added that Peab, which was carrying out and supervising the construction work at the site, had demanded a report on the accident from their subcontractor and subsidiary company Peab Infra, which had commissioned the quarrying work.

Finnish legislation stipulates that a plan must be drawn up for every explosion. The plan should include safety precautions and information specifying the area at risk from the explosion. The qualifications of those responsible for setting the charges of the explosives are also strictly enforced.

On July 5, it was reported that one person had been arrested in connection with the explosion. The suspect works for the company that carried out the construction work. Police said the suspect violated workplace safety, an offence involving danger to the public, and caused bodily injury. The head of the investigation, chief inspector Minna Immonen from the Länsi-Uusimaa police, said that the suspect may be charged with more crimes as the investigation progresses.

7 July - USA

120707-03-A WV, Point Pleasant. West Virginia Ordnance. High Performance Ammunitions. Point Pleasant's fire chief said separate explosions at a munitions bunker and at a parked trailer loaded with ammunition were either deliberately set or caused by extreme heat. Jeremy Bryant, chief of the Point Pleasant Volunteer Fire Department, said those are the only possible explanations for the explosions. He said the state fire marshal's office will determine the cause. Nobody was hurt.

Bryant said the first incident occurred shortly before 17:00, at the munitions bunker near the Mason County fairgrounds. Fire-fighters were still on the scene when they got the call about the second explosion a few miles away. Richard King owns the bunker and the tractor-trailer, which was parked at his home.

According to HInt records, an explosion occurred in 2010 in a munitions bunker in the McClintic Wildlife Management Area just north of Point Pleasant. That bunker was leased by Richard King, of High Performance Ammunitions, which is based in Pittsburgh. King lives in Point Pleasant. [HInt 10-05b, 100517-06.]

On July 10, it was alleged that an earlier, unreported, fire on July 1 was connected with the two later incidents. The earlier fire occurred on Sunday, July 1, at the building which used to be the old Mason County Dog Shelter near the McClintic Wildlife Management Area. The building is now privately owned by West Virginia Ordnance which is owned by Richard King of Pittsburgh, according to investigators. The fire at the old shelter involved propellants and ammunition and was brought under control by fire-fighters with the Point Pleasant Fire Department. Bryant said investigators with the West Virginia State Fire Marshal's Office were called to investigate the fire with the cause remaining undetermined at this time.

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Bryant said there was no electricity going to the structures which caught fire, so at this point investigators were trying to determine if the fires were intentionally set or heat-related.

Bryant said King was not home or in the area when the fires started. King and West Virginia Ordnance also owned a bunker in the TNT area that exploded in 2010. That explosion was determined to be caused by a deterioration of the ammunition and the excessive heat.

9 July - Turkey

120709-09 Izmit province, village of Rahmiye. Cuhane Military Ammunition Depot. Four Turkish soldiers were wounded in an explosion at an ammunition depot in western Turkey. The explosion occurred at Cuhane Military Ammunition Depot, located near the village of Rahmiye in Izmit province. Fire-fighters and ambulances were sent to the depot to bring the resulting fire under control.

16 July - India

120716-03 Andhra Pradesh, Nalgonda municipality. Two workers were killed in an explosion at an explosives manufacturing unit in Pedda Kandukuru village in Nalgonda. Experts were called immediately to make safe six kilograms of explosives which were stored in the factory at the time of the incident. Sources said the incident occurred at around 15:00 in one of the sheds. The ceiling collapsed under the impact of the explosion, and two workers died on the spot, while another worker was seriously injured. He was rushed to a private hospital in Hyderabad. The workers were mixing chemicals when the explosion occurred.

Alair CI Krishna Kishore said police had registered a case against the factory management: "Accidents had happened in the past too. We have started an inquiry into the circumstances that led to the blast."

12 July - Canada

120712-01 Ontario, Merritton. Lion Dunc Schooley pool. Emergency responders were called to the scene of "a significant chemical reaction" at Lion Dunc Schooley pool at around 13:00. The reaction occurred inside the pool building and was caused when a contractor delivering pool chemicals inadvertently mixed 20 to 30 US gallons of [a chlorine compound] into a tank holding [hydrochloric] acid.

The resulting fumes caused respiratory problems and led to burning in victims' eyes and lungs. The incident affected six people who were attending the pool, five teenage lifeguards, and an adult contractor working for the pool chemical firm. According to St. Catharines [sic] Fire Chief Mark Mehlenbacher, while the contractor's symptoms were similar to the rest of the victims, his condition could become more severe over the next 12 hours to four days, and he would need to be monitored during that time: "He's fortunate he got out. It could have been much worse. The concentrations do much damage to the lungs."

19 July - Azerbaijan

120719-07 Baku, Garadagh region, Guzdek settlement. State Frontier Service of Azerbaijan. Nine people were injured, including three employees of the Ministry for Emergency Situations, while extinguishing a fire at an ammunition store of the State Frontier Service of Azerbaijan in Garadagh, in Baku region. A report from the Health Ministry of Azerbaijan said no lives were in danger. The incident was said to be the largest at Azerbaijan's military stockpiles since first half of the 1990s when "Armenian raiders" blew up ammunition stores in the Guzdek settlement. According to a joint statement by the State Border Service and Emergency Situations Ministry, the fire broke out at the ammunition depot of the military unit 'N' of the State Border Service at 07:00.

25 July - Russia

120725-01-B Novosibirsk region, 100 km from Novosibirsk city. A train carrying munitions caught fire about 100 km from Novosibirsk city, between the stations of Chulyrn and Duplenskaya. The fire destroyed ten wagons. According to the Russian Ministry of Defence, one of the wagons carrying 30mm shells caught fire: "All the personnel on the train were evacuated. The incident and the explosion of munitions destroyed ten wagons without causing any deaths or injuries". A spokesman said the train was carrying munitions meant for destruction, and stopped in an isolated area.

According to later reports, the train was on the Trans-Siberian Railway, and was destroyed by grenades which caught fire. There were reports that a wagon was completely destroyed by fire, and four more were severely damaged by shrapnel from the grenades.

On July 26, a source in investigative agencies said: "A criminal case was opened based on Part 1, Article 349 of

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the Russian Penal Code. An investigation is underway". He said specialists finished examining the site on the evening of July 25, letters of inquiry were being compiled, and documents were being confiscated.

31 July - Ecuador

120731-06 Province of Tungurahua, Píllaro canton, San Miguelito parish, San Jacinto. A gunpowder explosion injured three people. The people were inside a house when the explosion occurred at 13:45. The injured, who had second degree burns, were taken to Ambato Regional Hospital.

According to the National Police, handmade fire-works were produced in the building. Manuel Castro, Chief of Police Píllaro, said that the block walls of the house, and the tile roof were destroyed by the blast, adding: "There were flammable materials around the house. The handling of the material was inappropriate."

31 July - Russia



120731-12 Gulf of Finland. One seaman was killed and at least four injured during a live-fire exercise by the vessel Perekop, in Russian territorial waters of the Gulf of Finland. The incident occurred around noon. According to military investigators, the Perekop executed artillery fire as planned, but the shell of one of the guns hit the ship's superstructure – davits on the port side – instead of the intended target.

Sviatoslav Pakhomov, Head of the organizational and analytical department of the Military Investigation Department of the Investigative Committee of Russia on the Western Military District, told national media: "We found that the training was carried out by firing at an air target. So at the moment a shot was fired, which caused the destruction of these supports, causing death and injury of military personnel." Investigators said a shell hit the davits and exploded directly above the deck where there were five sailors. Twenty-year-old Nikita Mitrofanov, called to the Navy four months ago from Volkhov, died on the way to the hospital. Another sailor was in the Military Medical Academy, Kirov. Three sailors did not need hospitalization.

The sailors should not have been on the deck during the volley, as they all had to be inside the ship to its battle positions. Pakhomov said: "We are considering different versions of their location on the deck. Including one related to photography. Also, that they could not escape in time during the firing. To build any assumptions now would be quite premature."

The version that the sailors wanted to be photo-graphed against a background of shooting guns is not so absurd. The deceased, Nikita Mitrofanov, young man noted for taking risks. On his personal page in "Contact" are a lot of extreme pictures. For example, Nikita with a friend hanging from a bridge, or sitting on the edge of a roof of an unfinished house.

1 August - Belgium

120801-09-A Liège region, Clermont-sous-Huy. Poudrière belge de Clermont (PB Clermont). A major incident was declared at the explosive powders plant following a leak in a barrel containing acid. The plant is classified Seveso.

On August 2, it was reported that the leak formed a cloud of sulphuric acid, and police invited local residents to "shelter-in-place". Fire-fighters, however, said there was no danger to local inhabitants or to the environment.

PB Clermont is a supplier of propellant powders to the small & medium calibre ammunition industry.

20 August - Czech Republic

120820-13 East Bohemia, Pardubice. Synthesia. On August 20, nitrating gases leaked from the Synthesia complex, and spread over the towns of Pardubice and Rosice, after an explosion blew the cover off one of the tanks. The gas cloud started to disperse at high altitudes later in the afternoon.

On August 23, Daniel Kurucz, general director of the Synthesia plant in Pardubice, said it would empty the tanks of nitrating mixtures and temporarily shut down nitrocellulose production. The firm's emergency committee approved these security measures after an overnight meeting. The rest of nitrating mixtures in the tanks will be analysed.

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Kurucz said: "We have gradually started to empty the tanks, so even potential risks are eliminated. The production of nitrocellulose is discontinued for a couple of days or weeks, we suppose."

he accident was probably caused by extremely high temperatures, up to 40°C, that triggered an explosion without fire. Kurucz said: "We are storing gas in a standard way, but in spite of that we will seek a different method to prevent similar accidents."

Nitrogen oxides also leaked from Synthesia in July, 2010 due to a technical defect as well as high temperatures. [HInt 10-07a, 100701-03.]

21 August - Tajikistan

120821-08 Kulob region, Mumirak. On August 27, Tajik officials announced the death of a 10-year-old boy and injuries to two other youths which occurred on August 21 when a shell exploded near the Mumirak test field belonging to a Russian military base in Tajikistan. Tajik officials said the incident occurred on August 21, when the boys found the shell as they were reportedly helping their parents harvest wheat. Tajik media reports speculated that the shell could have come from the Russian military base. Russian military officials in Tajikistan rejected the reports, saying the shell had nothing to do with Russia's 6,000 troops based in Tajikistan. Tajik authorities launched an investigation into the incident.

22 August - Germany

120822-01 Baden-Württemberg, Neuenburg am Rhein. Rheinmetall Waffe Munition GmbH. Around 04:15, the gatekeeper at the Rheinmetall munitions factory called the emergency services to report a fire. Contrary to first reports, there was no explosion. Later, Rheinmetall announced in a press release that the place affected by the fire was a building in the area of prototype development.

Andreas Grozinger, overall commander of the fire Neuenburg brigade, said there were 74 fire-fighting units and 17 medical rescue teams on site. Due to the thick smoke, the operations management decided to ask the people to keep windows and doors closed, said Grozinger, so police and municipal vehicles drove through the streets as a precaution and informed residents via loudspeakers. In addition to the smoke from the fire, fire-fighting water created a vapour cloud above the plant. The fire department conducted air measurements to determine whether pollutants were released, but Grozinger said that was not the case. Police said no one was injured in the fire. There was a loss in the amount of €80,000; about a third of the building was destroyed. It was unclear what may have triggered the fire. Grozinger said pyrotechnic products of the factory are smoke- and illuminating-grenades, as well as decoys to protect soldiers during military deployments.

The last serious accident at Rheinmetall was in March 2007, when an explosion occurred in a plant for drying, filling and packaging of phosphorus granules. Five workers were injured, one man died shortly afterwards from his injuries. Two months later, a phosphorus grenade exploded in the hands of a worker; he was injured and contaminated. As a result, Rheinmetall introduced a new security concept with architectural changes. More recently there was an incident in July 2009. At that time, a chemical substance was ignited during a pressing operation. No one was injured.

25 August - Austria

120825-04 Wien/Vienna. An extremely dangerous incident occurred in the River Danube in Vienna, Donaustadt. At about 15.00 a still live bomb from the Second World War suddenly exploded in the river. A passer-by on the Praterbrücke [Prater Bridge] suddenly saw the fountain in the water and called the police. Fortunately, according to the police, was no ship in the vicinity of the explosion, and no one was injured.

28 August - Germany

120828-07-A Bayern/Bavaria, city of München/Munich, Schwabing district. A bomb disposal team detonated an unexploded 250 kg (500 lb) American bomb from World War II, found in the Schwabing district of Munich. The detonation happened shortly at 21:54. There were reports that sparks from the explosion caused the roofs of some neighbouring buildings to catch fire.

The bomb was discovered on August 27 by building workers at the site of an old bar that was being demolished. Experts decided it was not possible to make the device safe because of its chemical-based time-delay fuze. Such fuzes are unpredictable after seventy years underground. Consequently, it was decided to detonate the bomb in place. Overnight, at least 2,500 residents were evacuated from the area closest to the bomb, with others living further away being told to stay in their homes.

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The bomb was described as a high explosive, 500lb (250kg) device dropped by the Americans. However, the USAAF rarely used chemical-based time-delay fuzes, which were mainly used by the RAF and, earlier in WWII, by the German Luftwaffe in their attacks on Britain.

On August 29, it was reported that the explosion caused major damage to surrounding buildings, leaving a huge, unanswered questions about who would pay to fix it all. The extent of the damage was still unclear, but was expected to be in the millions of euro. The city council said several houses were uninhabitable, and two are considered to be in danger of collapsing. A spokeswoman for Allianz insurance company said that although acts of war were excluded from their policy coverage, the company would make an exception and still cover damages to policy holder's homes and belongings.

It remained unclear whether the city would pay for the damages. Munich Mayor Christian Ude called the issue of liability a "difficult question of law, which will likely end up being decided by experts", but added that "of course, those affected will receive compensation". However, Peter Lüg from the city's Regional Administration Office said there was no public liability claim to be made against the city. The detonation was carried out "according to the rules of the art", and the resulting damages were unavoidable. He spoke of "the long-term consequences of war".

30 August - USA

120830-10 IA, Middletown. Iowa Army Ammunition Plant. An explosion occurred around 17:00 at the Iowa Army Ammunition Plant in Middletown, Iowa. According to an official from the plant, the explosion occurred in "the line one operating bay" during the remote pressing of a 40-pound Octal [Sic. Presumably Octol, Ed.] charge. Because the pressing process is remote, the area was unoccupied and no one was injured. The fire that resulted from the explosion was put out by the plant's emergency team after about 45 minutes. A portion of the building was damaged by the blast. The cause is still being investigated.

03 September - India

120903-06 Himachal Pradesh, Kullu district, Sainj valley. On September 6, it was reported that the death of two labourers in an explosion at a hydroelectric project site in Sainj valley had exposed weaknesses in security measures being taken to ensure safety of people while carrying out the explosions. In protest, vehicles were smashed and labourers stopped work for the past two days.

On September 3, two Nepali labourers – Neema Lama and Harka Bahadur – died in an explosion while placing explosives at the site of a 100MW power project. While Neema Lama died on the spot, Harka Bahadur succumbed to injuries at the hospital. The accident occurred inside the tunnel. Sources said two other labourers were injured.

Tension gripped the project site as labourers alleged safety concerns. Kullu police registered a case under sections 336 and 304A of the IPC against the company on the complaint of labourer Supa Baha-dur. The angry labourers were joined by residents of nearby villages who claimed that the accident was a threat to their safety and security. The labourers warned the company that work would remain suspended until adequate measures are put in place. Kullu SP Ashok Kumar said the matter was being investigated and it was being checked to see if it was negligence on part of the workers or the authorities.

The placing of explosives for mining or tunnelling is a highly skilled task – not one that is typically given to someone described as "a labourer".

5 September - Turkey

<http://www.bbc.co.uk/news/world-europe-19499146>

120905-03-A Province of Afyonkarahisar, city of Afyonkarahisar, Kisla depot. Turkish Air Force. An explosion around 21:15 at an ammunition store killed 25 soldiers and wounded four others. The explosion happened at a military storage depot for hand grenades. Environment Minister Veysel Eroglu said the explosion was most likely caused by an accident, and he ruled out a terrorist attack.

It is thought many of the soldiers were trapped inside the building as fire-fighters tackled the huge fire. Rescuers found it difficult to reach the soldiers because hand grenades lay strewn around the area. National media said identification of those killed was impossible at the scene because of the force of the explosion. A large fire burned at the complex for several hours and emergency services had difficulty responding to the incident because of the high security in place.

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On September 11, national media reported that the initial report prepared by EOD technicians who investigated the scene said that the cause of the explosion was negligence. Hand grenades and shells, which should not be stored in the same place, were being stored together in the depot, and the detonators of the grenades and the fuses of the shells were mistakenly attached during the delivery.

The explosion reportedly occurred when a 105mm shell fell to the ground. The intensity of the blast was increased by all the other grenades and shells, which were stored with their fuses in place. Around 100,000 hand grenades exploded in the first explosion, while 15,000 of them were estimated to be under the soil. Around 5,000 grenades had been retrieved from the area during search operations. Some 67 shells that were not affected by the explosion were also unearthed.

The Turkish military also dismissed four ranking officers after they were convicted of negligence in the ammunition explosion, which killed 25 soldiers. In a statement, the Turkish army said that a Colonel, Lieutenant-Colonel, Lieutenant, and a Non-Commissioned Officer had been dismissed from their posts after a detailed report which showed the reason behind the explosion, concluding that it was negligence on the part of the discharged officers.

7 September - Cuba

120907-06 Province of Cienfuegos, Plan Mango. Fire-fighters extinguished a fire that broke out at a munitions depot in the south-central Cuban province of Cienfuegos. State media said no injuries were reported. The fire started at the Plan Mango site near the highway to the Punta La Cueva Hotel in Cienfuegos, located 278 kilometres (173 miles) southeast of Havana. According to a bulletin broadcast on a provincial radio network in Cienfuegos: "The population, however, should stay informed because the Provincial Defence Council and the territory's Civil Defence may have to take measures."

11 September - Bulgaria

120911-06 Stara Zagora Province, Kazanlak/Kazanlik. Arsenal AD. A storage facility at Arsenal AD, one of Bulgaria's largest military factories, exploded at about 16:35. It has immediately led to a fire in the storehouse at Bulgaria's major producer of rifles and AK-47s. The fire was tackled by the plant fire fighters and the town fire brigade. There were no reports of killed or injured persons in the military plant explosion. The environmental authorities had yet to measure any levels of pollution as a result of the explosion, while the Ministry of the Interior was investigating its causes.

A later report said the warehouse was full of "half-ready production made of nitrocellulose", which exploded "while it was drying up". Police said the explosion was caused by spontaneous combustion of "half-made factory produce containing nitrocellulose" as it was left out to dry.

The explosion appeared to be the latest in an ammunition depot in Bulgaria, after the June 5, 2012, explosion in a privately-owned munitions facility in Sliven killed three employees. [HInt 12-06a, 120605-01.] Other explosions since 2000 at Bulgarian munitions facilities (owned by either the Defence Ministry, or private firms) include:

- 2011, November 12. Explosions at former military storage facilities near the village of Lovnidol; the 3,000 shells contained no chemical or radioactive substances, and nobody was injured. [HInt 11-11a, 111112-05.]
- 2010, February 3. Midzhur factory, which produces explosives, located in the village of Gorni Lom, Chuprene Municipality, north-western Bulgaria, caught fire. The ensuing explosion injured four employees, with two of them suffering serious injuries. [HInt 10-02a, 100203-02.]
- 2008, August 10, Grenade storage facility at the Arsenal military plant in Kazanlak, central Bulgaria, caught fire, leading to explosions; nobody injured. [HInt 08-08a, 080810-03.]
- 2008, July 3. Military storage site near the village of Chelopechene, suburban Sofia, exploded, with blasts lingering for days. The explosions engulfed explosive processing facilities with 2,500 tonnes of conventional munitions and 20 tonnes of TNT. Nobody injured but the residents of the villages of Chelopech and Chepintsi were evacuated. [HInt 08-07a, 080703-01.]
- 2000, July 9. Fire near several villages in the south-eastern Haskovo District reached a munitions storage depot near the village of Ivanovo, and led to explosions.

12 September - Bulgaria

120912-05 Stara Zagora Province, Kazanlak/Kazanlik. Arsenal AD. A second explosion occurred around 09:00 at

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the Arsenal military plant in the town of Kazanlak. [See 120911-06, above.] The explosion occurred in Plant No 3, which is reserved for propellant powder production. No one was hurt in the blast, but there was material damage. According to initial data, the explosion came during repair works on installations used for nitrocellulose-based powder production. The explosion set on fire plant installations and grass. The fire was put down. There was no risk for company's workers or the population.

13 September - Maroc/Morocco

120913-02 100 km from Laayoune, El Hagounia. Two workers were killed in the accidental explosion of either a mortar shell or a land mine [reports varied] that they uncovered at an excavation for carrying electric cables. The explosion occurred when the workers fiddled with the device. The incident occurred near the defensive wall that was erected in the 1980s by the Moroccan Army in its war against the Front Polisario. Such incidents are fairly common in the area.

20 September - India

120920-04 Jammu and Kashmir, Jammu. At least six paramilitary Central Reserve Police Force (CRPF) men were injured, when a grenade exploded accidentally inside a training centre at Nagrota, on Jammu city outskirts. Police said that CRPF men were undergoing special training to handle hand grenades, during a refresher course, when one of the grenades (used for training purposes only) exploded due to some unknown reason. The injured CRPF men were rushed to Government Medical College Hospital in Jammu for treatment. Police said that injured personnel were fresh recruits and had sustained minor splinter injuries. A police officer said: "It is not yet known as how the device exploded as such kind of explosives are specially designed for training purposes and these only create sound when thrown".

05 October - France

121005-01 Var (83), Camp de Canjuers. Premier Régiment de Chasseurs d'Afrique (1er RCA). A soldier of the 1er RCA received second degree burns following the explosion of a pyrotechnic device which he was preparing for an exercise.

A military source said that the victim was preparing a pyrotechnic device "based on black powder" when the accident occurred around 08:00. The soldier was evacuated by civil helicopter of the Alpes-Maritimes department.

07 October - China

121007-01-B Hebei Province, Baoding City, Dongwuyao Village. Illegal manufacturing and storage of detonators triggered an explosion in a residential building of Baoding City in north China's Hebei Province, which left at least one killed and 34 injured. Police found home-made detonator shells at the explosion site of the six-storey building in Dongwuyao Village. Detonator shells and explosive materials were also discovered in the building's basement. Police suspected illegal manufacturing and storage of detonators might have caused the blast.

Part of the building collapsed after the explosion occurred at around 15:00 in the Yaoheningyuan Residential Community in Baoding. Witnesses said heavy smoke was seen following the explosion, which shattered window glass of buildings 200 metres away. The injured were taken to hospital for treatment. Among them, two were in critical condition, said a spokesman with the city government.

On October 8, the death toll in the explosion had risen to eight, more bodies were retrieved while rescuers were clearing the debris. Twenty-seven people were still in hospital. Two are in a critical condition and three are severely injured.

Two suspects, a 38-year-old man surnamed Ge and his 42-year-old girlfriend, turned themselves in to police in the eastern province of Anhui. Ge and two relatives started producing detonators in 2009. Due to poor sales, the three stored more than 50,000 unsold detonators at an apartment in the six-storey building in Dongwuyao Village.

12 October - Colombia

121012-05 Medellín/Medellin, Antioquia, Argelia municipality. A woman died and her eight-year old daughter was injured in an explosion that destroyed a house in central area of the municipality of Argelia, south-east Antioquia. The 23:30 explosion destroyed the house, killing the housewife, while the girl suffered serious injuries in one of her eyes and ears. Initially it was thought that the house, of concrete slab, had collapsed from structural failure, but after an inspection by the police anti-explosive agents from Antioquia it was established that the site had stored

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explosives used for fishing.

15 October - USA

121015-12 LA, Webster Parish, Camp Minden. Explo Systems Inc. An explosion occurred about 23:30 inside a bunker where black powder explosive was stored at Camp Minden, according to the Webster Parish Sheriff's Office. No injuries were reported. Deputies said the bunker was designed to absorb and deflect such an explosion. There were the usual rumours of meteorites, terrorists, and UFOs crashing.

Unusually, the debris thrown up by the explosion was captured on radar by National Weather Service (NWS) Shreveport. Doppler radar caught the event and the processed 3D images showed that it looked like a large balloon. Senior Meteorologist Kevin Martin said: "It's hollow inside. The object is likely a mushroom cloud, which is hollow like a jelly fish. Impressive never-the-less on radar". The NWS said that the initial event occurred at Latitude/Longitude 35.578 N, -93.351 W which is inside Camp Minden. The first image captured by the radar occurred at 23:28, with subsequent images captured at 23:37, 23:47, 23:56 and ending at 00:06. The weather radar data convinced many people that this was a UFO crash.

On October 16, a helicopter search in daylight discovered the blast site at an explosives storage igloo owned by Explo Systems, one of the companies in the Camp Minden industrial area. The camp is on the grounds of the former Louisiana Army Ammunition Plant, and many explosive-related companies have facilities at Camp Minden because of the special facilities it has for the storage and production of explosives. No injuries were reported, but there were reports of damage, including glass windows that were shattered in downtown Minden. Many people reported pictures knocked off walls inside their homes.

On October 17, it was reported that Louisiana State Police said that there was the possibility of a violation in connection with the explosion. Louisiana State Police Trooper Matt Harris said that "enforcement action" is pending.

Col. Ronnie Stuckey at Camp Minden said the bunker contained ordnance used by the military, but he declined to elaborate further, saying it was up to Explo to comment. Stuckey said he expects the area will remain sealed off for weeks until they can get prices for a company to come in and clean up the damage.

16 October - USA

121016-04 AL, Huntsville. Redstone Arsenal. US Army. Amtech Corp. Dynetics. According to Redstone and emergency medical officials, a worker at Redstone Arsenal was injured when an explosive device went off in his hands at around 08:00. Arsenal spokesman Dan O'Boyle said preliminary indications were that the worker was in Building 5400, the Aviation and Missile Research, Development and Engineering Center (AMRDEC).

Eric Edwards, director of AMRDEC, said a Dynetics employee was handling a small device in his work area when it detonated. AMRDEC and Garrison emergency and safety personnel responded and the man was taken by ambulance to Huntsville Hospital. According to Edwards, the man was at a work station when the explosion occurred. Col. John Hamilton, Garrison Commander for Redstone Arsenal said the damage was limited to the man's work area, but the fire department was called and the building was evacuated after the explosion as a safety precaution. AMRDEC said the injured employee has supported AMRDEC for four years as an ordnance specialist and conducts safety training for his team.

Two Redstone Arsenal workers were killed in an explosion on May 5, 2010 at AMRDEC. The victims were working on a new process to separate ammonium perchlorate from other elements in old solid-fuel rocket motors. [Hint 10-05a, 100505-03.]

MSIAC REPORTING

10 October in Russia, thousands of tonnes of ammunition have exploded at a military base close to the industrial city of Orenburg, near the border with Kazakstan. <http://www.bbc.co.uk/news/world-19892972> and https://www.youtube.com/watch?v=MP3GC8EDqv4&feature=player_embedded

A French appeals court Monday sentenced a former boss of a subsidiary of oil giant Total to a year in prison for a 2001 chemical plant blast that killed 31 people: [20120924-france-toulouse-azf-trial-chemical-total-jail-sentence-deadly-2001-blast-justice](http://www.bbc.co.uk/news/world-19892972).



2013 ▶ *Australian Explosive Ordnance Symposium*

12 - 14 November 2013

Canberra, Australian Capital Territory, Australia

PARARI 2013, the 11th Australian Explosive Ordnance Symposium, is jointly hosted by the Australian DOD's Directorate of Ordnance Safety and Thales Australia. Authors come from a variety of backgrounds including military strategy, insensitive munitions design and testing, UXO, disposal and management, EO safety, manufacturing, storage, transport and logistic support. The theme for PARARI 2013 is 'Integrating new technologies for explosive ordnance safety.'

The Parari 2013 Call for Papers begins February 2013, with the deadline for receiving abstracts being April 2013.

Registration Commences July 2013



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MSIAC NEWS

WELCOME TO MANFRED (FRED) BECKER

Technical Specialist Officer - Warhead Technology

Fred joined MSIAC in September 2012.

He has worked for 25 years for the US Department of Defense supporting weapon systems design, development, test and evaluation, production, failure investigations and In-service engineering. During his tenure, he was technically responsible for the Sidewinder Missile launcher, the Rockeye, APAM and Gator weapon systems, and then a variety of free-fall weapons and fuzes. Near the end of his career, he was a member of the team to develop and institute IM improvements to GP bombs for the US Navy and Air Force. Prior to joining MSIAC, he was the head of Emerging Energetics at the Naval Air Warfare Center – Weapons Division (NAWC-WD), the Naval Energetics Enterprise (NEE) network lead for IM within NAVAIR AND NAVSEA, and the chair of Blast Frag Warheads (MATG III) for the Joint Insensitive Munitions Technology Program (JIMTP).



FAREWELL TO VALERIE COUSENS



Valerie with the first
NIMIC team in
1992

I suppose one could say that it is the end of an era. We say farewell to Valerie after 21 years when NIMIC began in 1991. She will be leaving at the end of November and we wish her all the very best for a well-earned retirement.

She plans to remain in Belgium, and has no projects in mind for travelling the world, apart from regular trips to Germany and the occasional trips to France and the UK .

During her career with NIMIC/MSIAC she has seen several PMs and TSOs come and go and has thoroughly enjoyed the whole experience.

So let the new era commence!

FAREWELL TO STEERING COMMITTEE MEMBERS

At the last Steering Committee meeting we said farewell to Mary Ellen Caro, the US representative, André Pelchat, the Canadian representative and Roberto Jenaro de Mencos, the Spanish representative.

They are moving on to other posts and we wish them all the best in the future.

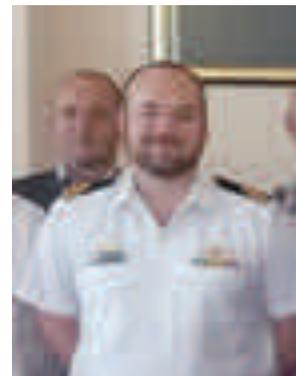
FAREWELL TO LEUT CHRISTOPHER MCGREGOR

Christopher was with us as an Australian Trainee from Cranfield University before taking up his duties in Australia.

The primary aims of Christopher's secondment to MSIAC over the period September – November 12 were to establish good working relationships with MSIAC staff, understand the capabilities and limitations of MSIAC as an organization and to consolidate his knowledge of explosive ordnance, particularly in the realm of insensitive munitions (IM).

He worked with the TSOs on current questions and on the review and gap analysis of Australian EO policy against NATO publications.

We thank him for his valuable support and wish him and his wife, who is expecting their first child, success and luck for the future.



LATEST PUBLICATIONS

(Available on the MSIAC secure website <https://sw.msiac.nato.int/SecureWeb/> or on request at info@msiac.nato.int)

LIMITED PUBLICATIONS

L178 Insensitive Explosive Materials: VIII. 1,1-Diamino-2,2 Dinitroethylene, November 2012 by Dr Ernst-Christian Koch

NEW ON OUR WEBSITE

- ⊕ New folder in Weblink for Training presentations;
- ⊕ AOP-38 will be accessible. Access will be controlled by Security Access Groups on a need-to-know basis;
- ⊕ AIMS - Newest web application which will replace databases HEAT, BIRD, FRAID, SYR, and DARTS;
- ⊕ Communities of Interest (COI).