

Lettre du



MSIAC

Munitions Safety Information Analysis Center

Newsletter



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INSENSITIVE MUNITIONS TECHNOLOGY GAPS WORKSHOP

Instituut Defensie Leergangen
The Hague, The Netherlands
20-24 June 2011

Inensive Munitions (IM) are recognised as one of the key considerations when designing and/or procuring munitions. There is now a wide range of technologies and techniques that can be employed to reduce the response of munitions to unplanned stimuli.



(Continued on page 2)

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However, IM Technology Gaps still remain. An MSIAC workshop was held in May 2009 to identify and prioritize them, with emphasis on the end-user's, i.e. the warfighter's, experience and needs. It has been established during this workshop that munitions currently in use in operations are subject to attack by fragmentation warheads, shaped charge jet weapons and explosively formed projectiles and most of them are vulnerable to these aggressions.

These munitions and the perceived mitigation gaps have been the subject of the MSIAC-sponsored workshop in Instituut Defensie Leergangen, The Hague, The Netherlands from 20 to 24 June 2011.

The Netherlands Defence College, known in the Netherlands as the 'Instituut Defensie Leergangen' (IDL) and situated close to The Hague, is a training institute where defence managers and staff officers of the middle and upper echelons can raise their level of knowledge, insight and experience to new heights.

The primary task of the IDL is to provide career and specialist training courses for officers in the Armed Forces and civilians who work within the defence sector. In addition, the IDL provides training courses for officers of the armed forces from Middle and Eastern European countries.

Some facts and figures:

- *The IDL emanated in 1992 from the Military School (1868), the Naval Staff School (1921), the Staff School for the Air Force (1949) and the Advanced Military Courses (1989).*
- *IDL staff is approximately 60 people, 55% military and 45% civilians.*
- *On a yearly basis, IDL hosts some 650 students, both from the Netherlands and abroad.*

IDL has 24 conference rooms of various sizes and 25 syndicate rooms. The biggest room, the "Bolman auditorium" has 200 seats and all modern audiovisual equipment.



The workshop main goals were to:

- identify shortfalls in technology (gun propulsion, rocket motor and warhead) and potential remediation options;
- assess if IED EFP threat mitigation should be considered as a new challenge for the IM community;
- identify system level mitigation methods that could be applied to existing munitions deployed in operations;
- identify areas for multi-national collaboration.

The event attracted 86 delegates and included participants from 9 out of 12 MSIAC member nations. The workshop was divided in two parts. The first part was a plenary session in which 19 papers were presented. The second part consisted of a series of parallel technical working groups, one focusing on the vulnerability reduction of munitions in operations and three others on the mitigation of IM Technology Gaps for the different munitions components (gun propulsion, rocket motor and warhead).

Full details of the workshop discussions and information exchanged will be available in the workshop proceedings due to be published in September 2011. For the purpose of this newsletter only a very brief summary of the principal findings were:

- **IED EFP threat**

- Not enough data readily available on the response of munitions components.
- Similarities but correlation not demonstrated between some IED EFP slugs and STANAG 449.
- Fragment or the French Heavy Fragment; Need for experimental investigation of munitions response before further discussing the need to consider IED EFP as a new IM threat.

- **Munitions in operations**

- Requested prioritization of the stockpile for IM insertion (munitions that are most commonly used by the warfighter, vulnerable to attack and that improve



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warfighter operational efficiency). improvement of casing/shielding materials used to make them lighter and easier to assemble.

- **IM Technologies, fragment impact (FI) and shaped charge jet impact (SCJI)**
 - Aggressions generally passed with most recent gun propellants.
 - Minimum smoke rocket motors considered a major issue to all IM threats but promising concepts currently being tested.
 - Mitigation available for most warheads against FI but SCJI still considered as a major issue.
- Suggestion to amend the **STANAG 4526** on shaped charge test as current levels not representative of existing threats and national standard SC aggressions being used instead.



MSIAC would like to thank the Dutch Defence Academy for their warm welcome and for providing us with such an exceptional facility.

We would also like to thank the participants, and especially the working chairs, for making this event a great success. We have received a great deal of positive feedback from the participants, all of whom found the workshop worthwhile and informative.

Dank u Wel



Instituut Defensie Leergangen (IDL)

A CD-ROM comprising the papers and presentations (MSIAC RESTRICTED) will be available at the end of July and the final proceedings (MSIAC Restricted) by the end of September 2011. They will be sent automatically to the workshop participants, as well as being available upon request at info@msiac.nato.int.

IMPROVING YOUR TEMPER

For a long time MSIAC has been promoting the use of modelling, protocols, small-scale testing, generic testing, data on similar munitions and expert analysis to aid in the prediction of munitions' IMness or Safety, and to increase the confidence in the result.

In order to support the use of modelling in assessing munitions safety, MSIAC is in an ideal position as an Information Analysis Center to become a focal point for exchanging/sharing engineering models devoted to IM or Safety Assessment within the MSIAC member nations' experts.

In 2004, a first step was taken with the release of a Toolbox of Engineering Models for the Prediction of Explosive Reactions, called TEMPER v1.0, developed by Emmanuel Lapébie (Centre d'Etudes de GRAMAT, French MoD). TEMPER is a unique and powerful tool that utilises a library of empirical or semi-empirical models dedicated to IM assessment. It is an "open source", Object-Oriented Programming project, which allows full flexibility to add custom models or to enhance existing ones.

The main features of TEMPER are as follows:

- Library of threats, models and parameters to run the models;
- Direct selection of threat/mitigation/structure/model from the Graphic User Interface with automatic compatibility management;
- Ability to perform parametric or stochastic simulations by varying one or two parameters of the problem;
- in-line library of materials data and models;
- ability to run multiple models on the same simulation;
- Ability to draw curves and save results using an embedded Excel workbook.

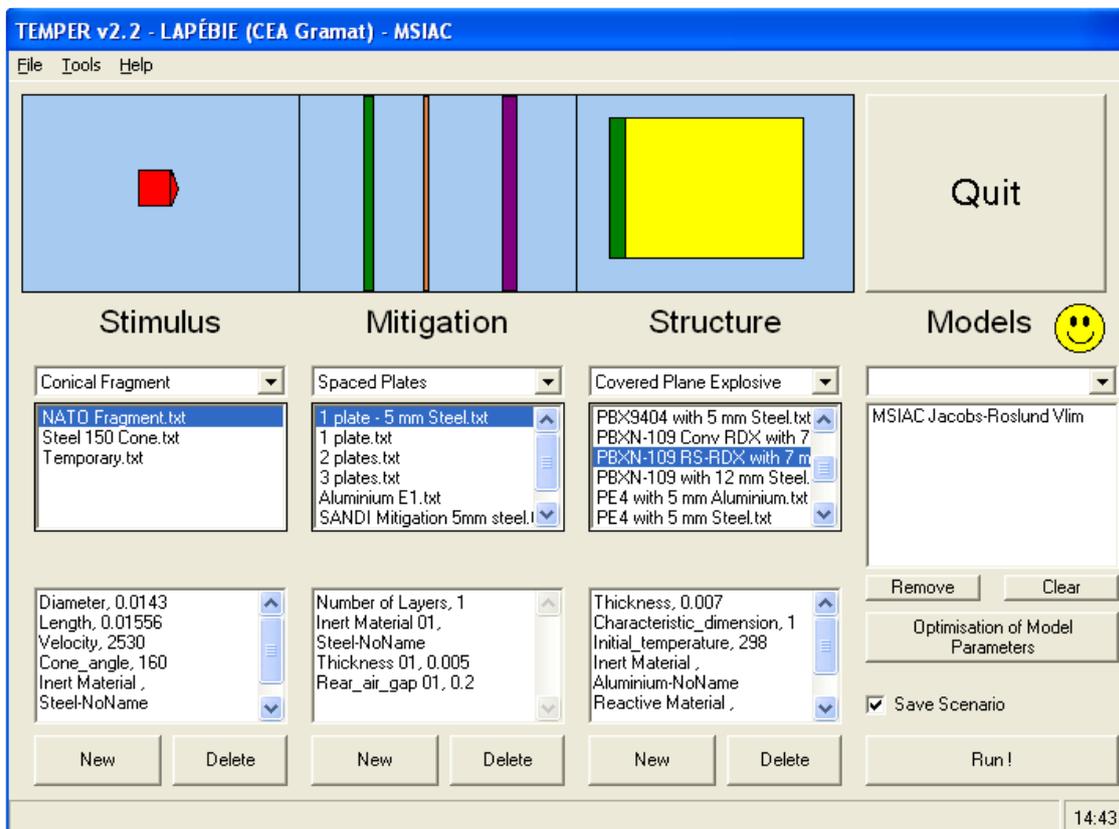


Figure 1: TEMPER v2.2 Main Window for Simulation of Sympathetic Reaction Configuration

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TEMPER v2.2 is now ready for use and includes many new features such as:

- an evolved thermal 1D model, INITHER, that can be used for confined energetic materials and that takes into account the heat sources caused by the energy release due to the degradation of energetic materials;
- a sympathetic reaction model, SANDI, that is based on a different approach than that of the One-on-One Warhead model already available in TEMPER v2.0;
- an MSIAC modified Jacobs-Roslund model that is based on the analysis of many experimental test results and that requires only one parameter. Values for this parameter are provided with the TEMPER software for several hundred compositions in an Excel spreadsheet (figure 2);
- the implementation of a conical fragment model that especially enables to simulate the NATO fragment defined in STANAG 4496 for IM testing (figure 3);
- the modelling of a residual fragment after perforation of a mitigation for conical-ended and parallelepiped fragment. This model will be very useful to simulate the impact of a NATO fragment on packed munitions.

MSIAC Modified Jacobs-Roslund Model

Database of Coefficients

for TEMPER Calculations

Version 1.0



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[Gap Test Results and "A" Coefficients for Compositions](#)

[Gap Test Results and "A" Coefficients for Ingredients](#)

[Information on NOL Large Scale Gap Test](#)

Neither MSIAC nor the participating Nations can guarantee nor warrant the adequacy, accuracy, currency or completeness of the Technical Information contained in this database.

Figure 2: Database of Coefficients for the MSIAC Modified Jacob-Roslund Model

INITHER and SANDI have been developed by the French company SNPE Matériaux Energétiques (SME) in the Centre de Recherche du Bouchet (CRB) site under French MoD contracts. The CRB and the French MoD representatives agreed to release these models and make them available to the MSIAC community. These successful model integrations show the federative potential of TEMPER. TEMPER users, and more broadly MSIAC nations, are highly encouraged to follow the example of CRB and share models that can be beneficial for the Munitions Safety community.

From the MSIAC secure website, the TEMPER Group's participants can download:

- an executable or an open-source version of the software;
- the user manual (MSIAC report L-139 Edition 2);
- a comprehensive tutorial describing the main features of TEMPER v2.2 and the way to use them (MSIAC report L-137 Edition 2);
- documents providing information and parameters on the models implemented in TEMPER;
- procedures for developers to implement a new stimulus and a new model (MSIAC report L-138).

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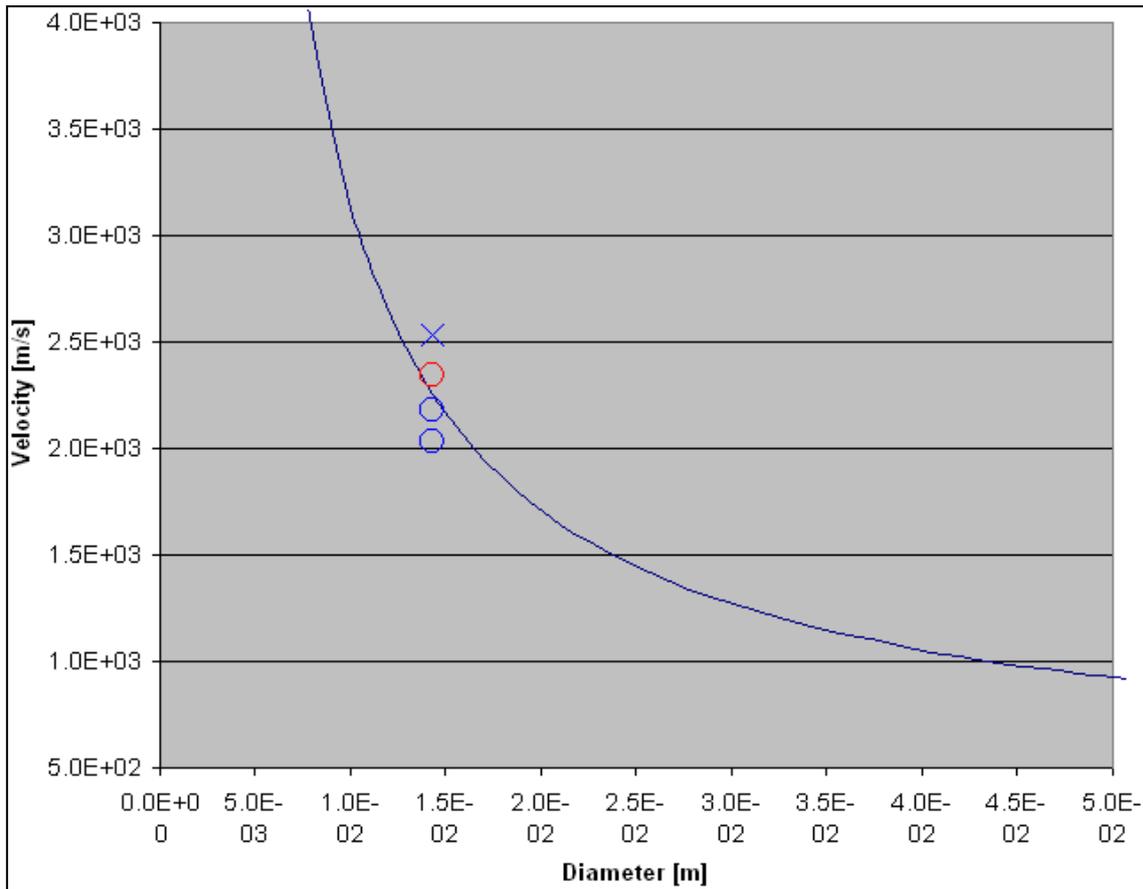


Figure 3: TEMPER Simulation for NATO Fragment Impact on a Warhead Filled with PBXN 109 (RS-RDX)
Assessment of Steel Mitigation Thickness to Prevent Warhead Detonation

TEMPER is a rapidly evolving program and has more and more users (45 in April 2011). In future, improvements to TEMPER will be all the more beneficial if users and developers actively participate to the evolution of the software and propose/implement model changes as well as new models.

IT IS NOW TIME TO JOIN THE TEMPER GROUP!

For more information contact:
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EUROPYRO 2011 37TH INTERNATIONAL PYROTECHNICS SEMINAR & 8TH WORKSHOP ON PYROTECHNIC COMBUSTION MECHANISMS

Reims, France
14-19 may 2011



Participants of the round table discussions.

From left to right: J. Callaway, G. Migliorero, E.-C. Koch, M. Bichay,
C. Lopez, P. Pascal and R. Armitage.

This year's 37th International Pyrotechnics Seminar was held in conjunction with EUROPYRO 2011 in Reims, France. The event was organised and hosted by the French Association of Pyrotechnics (AFP) and the Groupe de Travail de Pyrotechnie (GTPS). Ninety-eight presentations were given in nineteen sessions which were dedicated to:

- New Energetic Materials & Molecules;
- Insensitive Munitions Technology and Policy;
- New Explosive Devices;
- Nano-Energetic Materials;
- Regulations, Environmental Aspects and Disposal of Energetic Materials.

Noteworthy presentations relevant to munitions safety and IM:

- NDAMBI et al., Numerical Simulations of a Pyrotechnic Shock Test;
- D. PICART et al., Numerical Simulation of the Susan Test: Ignition of a HMX Based Plastic-Bonded Explosive;
- C. COULOUARN et al., Development and Characterization of a IM TNT Based Explosive Composition XF11585. Applications for the 60 mm to 120 mm Calibre Range;
- C. COLLET et al., B2514A: A Novel Enhanced Blast Explosive;
- F. CHASSAGNE et al., Modelling of Intumescent Coatings Growth: Simulation from the Lab-scale to the Large one;
- F. NOZERES et al., Simulations of Threats defined in STANAG 4439 on a 155 mm artillery shell;
- Y. GUENGANT, How to Get Insensitive Munitions Benefits According to Hazard Classification;
- S. BORDACHAR, A New impulse for the French Murat policy;

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- N. DAVIES et al., Blast and Heat Flux Characterisation of MTV Compositions.

Noteworthy presentations relevant to energetic materials and munitions technology:

- V. WEISER et al., Combustion of Various Metal Particles in Combination with RDX and the Influence of Additional Air;
- S. KNAPP et al., Modelling Emission Spectra of Diatomic Molecules for Characterization and Simulation of Pyrotechnic Mixtures;
- J. PORET et al., Boron and Boron Carbide Pyrotechnics for Green Light Emission;
- A. A. GROMOV et al., Aluminium, Zirconium and Titanium Combustion in Air with Nitride Stabilization in Condensed Combustion Products;
- A. WUILLAUME et al., Formulation and Characterizations of Nanoenergetic Compositions;
- W. ARNOLD et al., A Novel Technology for Multi-Point Initiation of High-Explosives;
- H. MOULARD et al. Control of the Functioning Time of an All-secondary Explosive Laser Ignited Detonator
- N. MURAVYEV et al. Titanium Dioxide Influence on Combustion of HMX.

Ernst-Christian KOCH gave a presentation co-authored by V. WEISER & E. ROTH, Combustion Behaviour of Binary Pyrolants Based on Mg, MgH₂, MgB₂, Mg₃N₂, Mg₂Si and Polytetrafluoroethylene (O-XXX).

A round table discussion on “Challenges and Perspectives in Pyrotechnics – Defence & Space Missions: Mid- and Long-Term Policies ” was organised at the meeting. It was chaired by Rik Armitage of Chemring/UK and was attended by:

- Magdy BICHAY, NSWC, USA
- Corinne LOPEZ, DGA, France
- Gerard MIGLIORERO, ESA, France
- Jim CALLAWAY, DSTL, UK
- Philippe PASCAL, CNES, France
- Ernst-Christian KOCH, MSIAC

It was emphasised that effective knowledge management is one of the challenges in manufacture and R&T of energetic materials.

A guided tour of the Reims cathedral, which was celebrating its 700th anniversary that very week, was included in the programme. An excellent dinner at the Pommery Winery and a spectacular fireworks display, sponsored by Etienne Lacroix, contributed to an enjoyable finale.



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Simultaneously the 8th International Workshop on Pyrotechnic Combustion Mechanisms was held on Saturday, 14 May 2011 (<http://www.pyroworkshop.net/>).

Thirty two participants from ten nations attended the following presentations.

- M. COMET, ISL, France
 - > Control of the Reactivity of Phosphorus-Based Nanothermites
 - > Nanocalorimetry for the Characterization and the Detection of Energetic Materials
- J. CORBEL, TNO, Netherlands
Understanding Strobe Reactions
- A. Y. DOLGOBRORODOV, Semenov Institute Moscow, Russia
Silicon Based Mechanoactivated Energetic Nanocompositions
- C. ROSSI, Université de Toulouse CNRS LAAS, France
Multifunctional Nano-Energetical Material on Chip
- M. RUSAN, LMU Munich, Germany
Some Recent Aspects of Boron and Silicon in Energetic Materials
- U. SCHALLER, Fraunhofer ICT, Germany
Triazolium based energetic ionic liquids.



Participants and presenters of the conference.

LATEST PATENTS OF INTEREST



(11) **EP 2 338 863 A2**

(12) **EUROPÄISCHE PATENTANMELDUNG**

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(54) **Bis-Tetrazolyltriazemat, Verfahren zu dessen Herstellung und Sprengstoff oder Brennstoff enthaltend bis- Tetrazolyltriazemat**

(57) Die Erfindung betrifft ein bis-Tetrazolyltriazemat, wobei das bis-Tetrazolyltriazemat ein Guanidinsalz, ein

Guanylharnstoffsalz, ein Melaminsalz oder ein Salz eines Alkalimetalls oder eines Erdalkalimetalls ist.

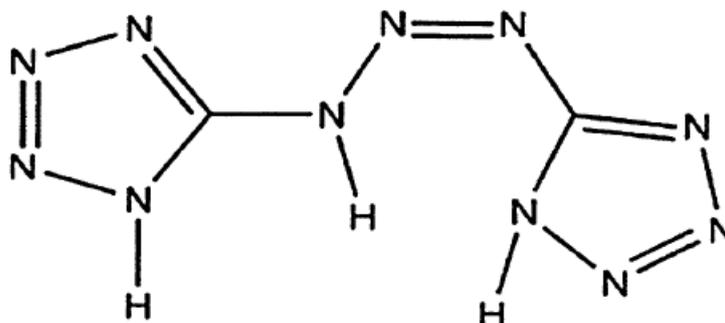


Fig. 1

EP 2 338 863 A2

PROCUREMENT ISSUES PRESS REVIEW

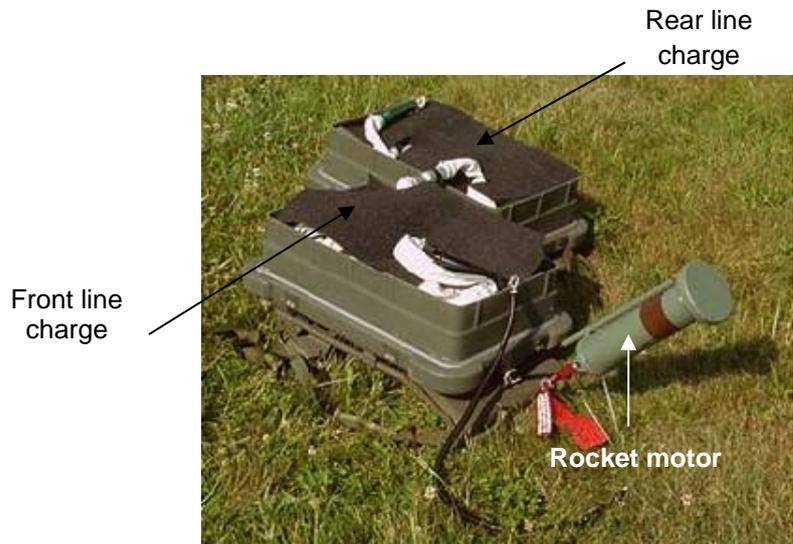
If you have information you consider of relevance to this section please do not hesitate to contact MSIAC at info@msiac.nato.int

CHEMRING ORDNANCE AWARDED ANTI-PERSONEL OBSTACLE BREACHING SYSTEMS (APOBS) CONTRACT

www.chemring.co.uk – 22 June 2011)

Chemring Group PLC (“Chemring”) has announced that its US subsidiary, Chemring Ordnance Inc. of Perry, Florida, has been awarded a contract to manufacture the MK7 MOD 2 Anti-Personnel Obstacle Breaching System (“APOBS”) for the US Army and Marine Corps. The total estimated contract value is in excess of \$150 million over three years if all option quantities are exercised.

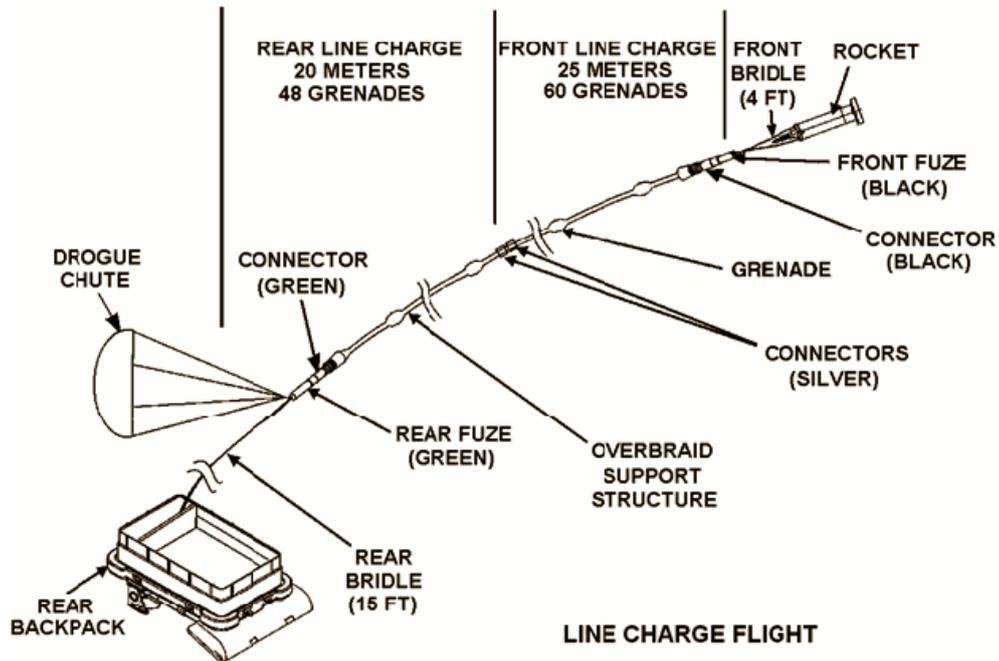
The APOBS is a 130-pound two-man portable system capable of rapidly breaching a 0.6 meter footpath through fortified complex obstacles containing anti-personnel (AP) mines and light obstacles such as multi-strand wire. The aim of this system is to deploy a 45 meter line of explosive grenades by means of a rocket motor. The grenades are clipped to an overbraid support structure. Following deployment, the two fuzes put at each end of the line detonate the 108 grenades due to a detonating cord, which is contained in the overbraid support and runs through the centre of the grenades.



APOBS System

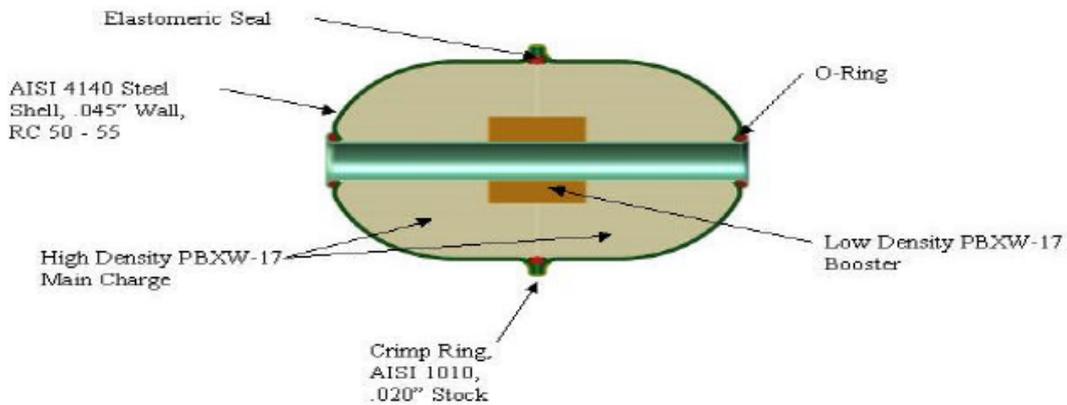
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APOBS Principle

Each grenade comprises a high-density PBXN-10 (94% RDX, 1.5% Hytemp and 4.5% DOA) main charge and a low density PBXN-10 booster sealed in a steel shell. The detonating cord which goes through the grenades contains PBXN-8 explosive (RDX, hydroxyethyl cellulose, stearic acid).



APOBS Grenade Schema

IM tests were performed in the packed configuration and resulted in a pass to slow and fast cook-off, bullet and fragment impact and sympathetic reaction.

	FCO	SCO	BI	FI	SR
APOBS	V	V	V	V	P

APOBS IM Signature (Packed)

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US ARMY AWARDS RAYTHEON \$173 MILLION CONTRACT FOR EXCALIBUR

www.raytheon.com – 21 April 2011)

Raytheon Company, TUCSON, Arizona, received a \$173 million US Army fiscal year 2010 contract for the production of Excalibur precision-guided projectile rounds for in-theater use. This contract marks the beginning of full rate production for Excalibur Ia-2.

Fielded in 2007, Excalibur is a 155 mm precision-guided artillery round with extended range that is currently in use with the US Army and Marine Corps. Excalibur Ia-2 aims at improving Excalibur shell to be fully compliant with the Operational Requirements Document (ORD): 30 km range; 20 m Circular Error of Probability (CEP), with 10 m as the objective by using GPS precision guidance technology; and reliability greater than 85 per cent and function in jammed environment. It must also handle the full charge 4 in the L/39 Paladin where it should yield a range of 40 km thanks to its base bleed.

Excalibur provides first round fire-for-effect capability with accuracy reported within 10 meters (32.8 feet) of its target. This accuracy protects warfighters in close proximity to the target and provides a precision engagement capability. Excalibur precision-guided projectiles give warfighters life-saving options when close air support is unavailable. With more than 300 rounds fired in theater, the US Army and Marine Corps have increased their use of Excalibur in the past year.

Excalibur Ia-2 shell has a unitary blast/fragmentation warhead which incorporates several IM features to mitigate warhead reaction to thermal and mechanical aggressions such as insensitive explosive PBXN-9 (92% HMX, 6% DOA and 2% Hytemp), internal polyethylene liner, lateral venting holes, special packaging. The shell in its container passed bullet impact, fragment impact, fast cook-off and sympathetic reaction tests. It however exhibited a type III reaction in slow cook-off configuration.



155 mm Excalibur Shell in Flight Configuration

	FCO	SCO	BI	FI	SR
Excalibur shell	V	III	V	V	P

Excalibur IM Signature (Packed)

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CANADA BUYING MORE 'SMART' MUNITIONS TO REPLENISH LIBYA MISSION

(www.canada.com – 14 June 2011)

Canada is ordering another 1,000 smart bombs as CF-18 fighters continue to carry out missions against Libya.

The Defence Department recently ordered the equipment needed for more than 1,300 laser-guided smart bombs. That order consisted of specialized nose and tail systems Paveway II – GBU-12, which transform an unguided "dumb bomb" into a laser-guided smart bomb.

The Paveway is fitted on the IM BLU-111 bomb. This bomb is filled with an insensitive cast-cured explosive PBXN-109. (64% RDX, 20% Aluminium and 16% HTPB). BLU-111 exhibits a good IM signature: type IV/V reaction in fast and slow cook-off, type V to bullet impact and a type IV to fragment impact. However it does not pass sympathetic reaction.



	FCO	SCO	BI	FI	SR
BLU-111	IV/V	IV/V	V	IV	I

ACCIDENTS REPORTING

27 December 2010 - 30 March 2011

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

6 April - Russia

110406-04 Near the settlement of Dachny, Lipetsk region. Three people were killed, and one injured died later, in an explosion at a military base in central Russia. Colonel Igor Konashenkov, a Defence Ministry spokesman, said the explosion occurred at an ammunition storage and disposal depot in the Lipetsk region, about 450 km southeast of Moscow. Konashenkov said: "The fire was localized and no ammunition detonation threat is looming any longer. The Defence Ministry committee is working at the blast site. According to preliminary reports, a box with 40 kilograms of powder detonated at about 10:20 Moscow time at a firing range in a powder disposal operation at the central missile artillery base near the settlement of Dachny in the Lipetsk Region. Four civilian employees of the base were killed, and another was injured in the explosion.

The military investigation department of the Russian Investigation Committee in the Tambov garrison opened a criminal case over the death of three people in the explosion of "a powder box" in a powder disposal operation at the central missile artillery base in the Lipetsk Region. The main military investigation department of the Russian Investigation Committee told newswires: "The criminal case was opened under Article 217 Part 3 for violation of the safety rules at the highly explosion hazardous facilities that entailed the death of two and more people through negligence". Meanwhile, the military prosecutor's office also launched an investigation into the observance of procedures during the operations at the highly explosive hazardous facilities. The detectives from the military prosecutor's office in the Tambov garrison were working at the blast site and the district deputy military prosecutor was there.

13 April - USA

110413-01 Toone, TN. Kilgore Flares. <http://www.wreg.com/news/wreg-kilgore-accident-april,0,2548007.story>



Three Kilgore Flares workers were sent to hospital in Bolivar after an accident at their workplace. Two workers were burned, while another was knocked unconscious. According to family members, the workers were mixing chemicals when the accident happened.

Kilgore Flares suffered an explosion in September, 2010, that hurt six workers. [See HInt 10-09, 100914-05.]. The plant was cited for 14 safety violations and fined \$348,000. Tennessee OSHA warned of too many flammable materials in individual work stations. [See HInt 11-03b, A-100914-05.]

13 April - Russia

110413-14 Pskov Oblast. Four soldiers died and one was injured by an explosion of ammunition inside a Nona self-propelled artillery unit during a tactical exercise in the Pskov region. The soldiers belonged to the 106th Tula Airborne Division, and were all young conscripts drafted from the Kostroma, Ryazan, and Tula oblasts.

The military prosecutor's office said: "It has been determined preliminarily that ammunition exploded inside a self-propelled artillery unit during a firing exercise, as a result of which four paratroopers of the 106th Tula Airborne Division were killed and one was wounded. ... A group of military prosecutors led by First Deputy Military Prosecutor of the Western Military District, Justice Major-General Igor Lebedev, and investigators from the military investigation department of the Russian Investigation Committee for the Western Military District are working at the scene of the incident".

14 April - Ireland

110414-05 Moneygall, County Offaly. A truck carrying explosives crashed into a shop in Moneygall. The incident happened at about 07:30 when the truck carrying commercial explosives crashed into the front wall of Donovan's grocery on Main Street.

A spokesman for the North Tipperary Fire Services said the truck involved in the crash was being used to transport explosive materials. However, the contents had been made safe for transit, and the detonators were being carried separately from the accompanying liquid elements. Following an



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inspection of the dangers posed by the explosive material, the truck was towed away at about 09:30. A mechanical fault is considered the most likely cause of the crash. The truck driver was shaken and he sustained a sore wrist. It is understood the vehicle carrying the explosives and detonators was travelling from a factory in Nenagh that produces components for commercial explosives used in the mining industry.

The shop is owned by the Donovan family, who also claim to own US President Obama's ancestral home.

20 April - Czech Republic

110420-06-A Semtín, Pardubice, 100km east of Prague. Explosia. Four people were missing, presumed dead, and at least seven people were injured in a major explosion at the Explosia factory, manufacturers of the plastic explosive Semtex. Jaroslava Doležalová, a spokeswoman for the company Synthesia, which owns the Explosia factory, told Czech media: "We don't yet know the details about the explosion, but four of our employees are missing. Currently, we're assessing the extent of the damage". The explosion occurred at 06:45; by 11:00, a team of dog handlers that arrived at the scene still had not begun searching for the missing employees as emergency services had warned there was a risk of a further explosion.

Vendula Horáková, spokeswoman for the Pardubice region fire brigade, told Czech Television that the explosion was thought to have been caused by nitroglycerine, but that no toxic gases had been detected in the air around the plant.

The factory's staff were strictly forbidden from speaking with journalists, but an employee who agreed to speak to the news server Aktualne.cz said the incident was probably caused by human error: "Judging by the location of the explosion, it was most probably caused by a mistake when mixing nitrocellulose with nitroglycerine. It was most likely human error, the failure to observe basic safety rules".

On April 22, it was reported that rescue workers had found body parts. A spokesman for the rescue workers said that was no more hope for the four missing workers, as it would be inconceivable that someone could survive such a powerful explosion in a confined space.

20 April - Tajikistan

110420-10 Roudaki district. Six persons were injured when an anti-tank shell exploded because of careless handling. According to the Ministry of Interior (Mol), the accident occurred at local market: "A 38-year-old entrepreneur Umar Saidov found the antitank shell at the Lohour training grounds and brought it to the market to show to his friends. Six persons were wounded as the shell exploded because of careless treatment. Two of them – Kuvandik Ikromov, 70, and Sadriddin Afghonov, 23 – are in critical condition".

Deputy Interior Minister Saidkhon Jurakhonov and Mansour Bukhoriyev, chief of the Interior Ministry department for combating drug trafficking, visited the site. According to Bukhoriyev, the explosion occurred after Saidov threw the shell to one of his friends just for fun, but the last failed to catch it.



27 April - Chile

110427-07 Fort Baquedano, near Huara, 70 km inland from Iquique, Tamarugal Province. About 12:15, four soldiers from the Brigada Acorazada Cazadores were injured after detonating an unknown item while performing an exercise in the area of Fort Baquedano. The accident occurred when a group of soldiers found an artefact, apparently a grenade, which was hidden in the place traditionally practiced for this military exercise.

Gen. Daniel Arancibia Clavel, Commander of the Segunda Brigada Acoraza Cazadores, said: "It was not an explosive or ammunition that was being used in the exercise, but that is an artefact that apparently was in place 10 years ago, and hidden less than 100 metres from the central unit of the brigade". The wounded soldiers remained hospitalized at the Regional Hospital in the city.

28 April - Albania

110428-03 Bigaz, region of Skrapar, 150 kilometres (93 miles) south of Tirana. Albania's defence ministry said an explosion at a munitions disposal plant killed one worker and wounded three others. A ministry statement says a shell accidentally exploded during work in Bigaz. Work at the army plant was suspended following the incident.

The defence ministry later said an army engineer, Sergeant Agim Mekollari, died on the spot at Ammunition Elimination Site near the village of Bigaz. The Defence Ministry said the causes leading to the explosion were being investigated, and all elimination of old ammunition by blasting had been suspended.

The death is the first since the Defence Ministry began destroying old ammunition stockpiles by detonating them in faraway locations following the deaths of 26 people at an ammunition dismantling plant near the capital Tirana and the main airport in March 2008. [See HInt 08-03a, 080315-01.]

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registered. Assistant Chief Charles Shannon said Well Done Bullet had rented that office space since February. He also said the city was unaware ammunition was being manufactured at that location. Agents from the Bureau of Alcohol, Tobacco and Firearms were called in to investigate the explosion.

Fire officials said there was some sort of explosion, and when they arrived on the scene the bottom corner of the building was full of flames. According to Nashville Assistant Fire Chief Charles Shannon: "At that time they also reported that they did have what sounded like ammunition sounds going off, small explosions".

The shop's name seems to have been prophetic. Our advice would be "Bullets à Point", rather than "Rare Bullets", though the latter could charge higher prices.

On May 18, Metro police spokesman Don Aaron said the owner of the shop was federally licensed to sell and import firearms, according to the Bureau of Alcohol, Tobacco, Firearms and Explosives, but was not licensed to manufacture ammunition. However, Aaron said he was known to keep containers of gunpowder for reloading ammunition.

It was alleged that the business was registered with the Davidson County Clerk's Office, but there was no advertisement of the ammunition business at the address. While the business was registered with the county, Metro Codes did not know it existed.

Aaron said the husband and wife owners were in the process of opening an ammunition reloading supply company. The store was broken into on May 11, with a thief taking a computer. The store's alarm went off after 05:00. Metro police found broken glass at the front door, and a large rock.

19 May - India

110519-09 Bazargaon village, Nagpur, Maharashtra. AMA Industries. A major explosion around 05:15 in an explosives manufacturing company near Bazargaon village caused earthquake-like tremors in Nagpur and nearby areas. The explosion left one dead and two injured, and was recorded as a 1.9 Richter scale event at the regional meteorological centre. Sources said that the blast destroyed the store of the company, and the material was enough to make 60-100 tonnes of explosives. There were three explosions one after the other, with flames being seen 5-6 km away.

However, the business housed raw materials for making commercial explosives and did not have finished products. According to local "industry players", raw materials usually would not explode unless bound into a single explosive – even in case of a fire. They can burn, but not explode. [Not universally true.]

Going by this theory, some said there could be chance that finished explosives were being stored in the premises, with an intent to later move them to the company's magazine nearby. The company's proprietor Akhtar Maimoon, however, denied having any finished goods in the store. Officials of AMA Industries cited the traditional short-circuit as one of the possible reasons for fire. However, no electricity connection is normally allowed in such areas, to prevent any such mishap. An explosive maker said: "Various chemicals like ammonium nitrate, aluminium powder, and sulphur when mixed in specific proportions make an explosive. However, all such chemicals stored at different places even in a single premises do not explode under normal fire. A safe distance has to be maintained for storing each of them."

Petroleum Explosives and Safety Organisation (PESO), the industry regulator, was said to be "strangely silent" on the incident. A team of PESO officials visited the site, late in the afternoon the the blast occurred early in the morning. A larger team went to the site the next day. The joint chief controller of explosives PC Srivastava said that the ministry of commerce, of which PESO is a part, did not permit its officials to divulge any information in such a case.

26 May - India

110526-06 Kalavarpadavu, near Bajpe, Mangalore, Karnataka state. Indian Strategic Petroleum Reserves Limited (ISRPL). Three men, including a Korean national, died, and four were injured, when improperly stored explosives exploded at the site of ISPRL's crude oil storage cavern project in the Mangalore Special Economic Zone Limited (MSEZL). The 1.5 million tonnes capacity project, which is being implemented on an 83 acre site, is expected to be completed in 2012.

26 May - Russia

110526-08-A Urman, Bashkortostan. At least 2,000 people were evacuated from the Urals village of Urman after a fire broke out at a local ammunition depot. Forty structures, including 14 apartment houses, were damaged when artillery shells exploded in a loading area of the depot in the Bash-kortostan region. A fire-fighting aircraft and a number of robots were deployed to put out the fire. A plume of smoke was visible more than 40 kilometres from the military base, whose warehouses mostly contained large-calibre cannon and mortar shells. A report said one person died during the evacuation.



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Interfax reported that artillery shells were exploding, and quoted an official as saying the fire may have spread from nearby woods. However, RIA cited another official as saying ammunition had exploded while being transported for destruction.

Defence officials said the fire began when a piece of ammunition went off during a regular loading operation, adding: "As a result of the fire, shells stored in a loading area began to detonate."

The Transneft oil pipeline monopoly stopped pumping crude to a local refinery as a precaution because the fire was running close to one of the company's lines.

On May 27, it was reported that a soldier's unsafe handling of cannon shells was the cause of the fire that killed two and forced the evacuation of thousands. Military prosecutors charged private Sergei Denyaev with gross violation of safety procedures while unpacking artillery munitions. Denyaev is alleged to have thrown a single shell containing a detonator into a pile of others, which touched off a fire engulfing thousands of rounds.

The fire forced the evacuation of more than 7,000 people from neighbouring villages, destroyed businesses employing more than 400 people, and temporarily closed local rail lines. The fire was still burning and detonations were still taking place inside the base 24 hours later.

30 May - Germany

110530-06 Leverkusen, Nordrhein-Westfalen. Dynamit Nobel. A small explosion occurred around 18:30 at Dynamit Nobel, and one employee was slightly injured.

According to the plant Executive Board at a hastily convened press conference, there was an explosion inside a pilot plant. This had released gases, but these were filtered through an internal filter system, so that there was no threat to local residents. At the time of the explosion five workers were on shift, one of them was slightly injured.

2 June - Russia

110602-03-C Izhevsk, Volga region of Udmurtia. On June 3, authorities in central Russia were still battling a fire raging through an arms depot storing around 10,000 tonnes of shells that forced the evacuation of more than 12,000 people. The incident began around 23:50 Moscow time [19:50 GMT]. The facility belongs to the Defence Ministry's missile and artillery directorate and is tasked mainly with munitions disposal. The facility stores from 5,000 to 10,000 railway wagons with various ammunition. It was believed 18 storage facilities are on fire.



Defence Ministry spokesman Igor Konashenkov said the military did not sustain any casualties. He said it was currently impossible to establish what caused the blaze: "Everything is on fire and exploding."

Emergencies Ministry spokesman Mikhail Surkov said the entire depot near the village of Pugachyovo near Izhevsk was consumed by the fire, and authorities had already evacuated more than 12,000 people from the area. The Emergencies Ministry said it would send two Il-76 firefighting aircraft, each able to carry 42 tonnes of water. They took off from Moscow's Ramenskoe Airfield early that morning.

Later on June 3, the number evacuated rose to 28,000, two people were reported killed, and the number of injured was at least 45, 19 of whom were hospitalized. Some of those who sought medical aid suffered from smoke inhalation, while others were cut by broken glass. A spokesman for the republic's head said: "There are also people who need psychological support".

The accident forced the Emergencies Ministry to temporarily close the Yelabuga-Izhevsk zone of the M7 federal highway, connecting Moscow and Ufa, the capital of the Urals republic of Bashkortostan. The nearby railway link was also closed. Pipeline owner Transneft said that it was not receiving the 161,000 bpd of oil that it usually gets from the region. Transneft spokesman Igor Dyomin said one of its pipelines had stopped receiving 131,000 barrels per day of oil from Rosneft. Shipments from producers LUKoil and Russneft, equal to 30,000 bpd, had also been halted. Dyomin said: "The pipeline stopped getting oil from 0100 Moscow time on Friday. Customers are still getting oil as we have reserves".

Russian President Dmitry Medvedev ordered Defence Minister Anatoly Serdyukov to launch an investigation into two explosions at military arms depots and warned that dismissals may be necessary. Suggesting that officers could lose their rank or be dismissed, Medvedev said: "Two times is already systemic. [sic]. Prepare proposals for me about who must answer for this and how. Since they do not understand the nice way, it is necessary to take away their shoulder straps".

On June 4, regional emergency ministry spokes-man Mikhail Turkov said that more than 1,200 fire-fighters were at



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the scene, adding: "The intensity of the explosions has gone down from around 40 to 45 per minute. The fire at the depot is localised and still burning at the centre. Some shells are still exploding". Turkov said the emergency ministry was using remotely controlled robots, water-bombing aircraft, and armoured vehicles to fight the fire, since the explosions made it too dangerous for fire engines, adding: "We cannot send living people in fire engines in there".

Under the headline "The defence ministry is disarming by blowing sky high", the Kommersant daily newspaper criticised the defence ministry for using conscripts to handle explosives without proper training or protection. A source familiar with the depot reportedly told Kommersant: "What happened at the Number 102 arsenal is total lawlessness and disorganisation. Soldiers were being exploited. They carried around the shells and gunpowder in zinc boxes without any special equipment. There was practically no training and the soldiers were carrying the shells around even at night".

On June 6, although Alexander Romanovsky, who heads the Defence Ministry's Main Artillery Directorate, faced dismissal for the three-day fire in the Udmurtia republic and a similar blaze in Bashkortostan two weeks earlier, another Ministry official said that Romanovsky had been placed in charge of investigating the Udmurtia fire. No time frame was set for the investigation.



7 June - USA

110607-07 Camp Minden, Webster Parish, LA. An explosion occurred about 06:20 at the Goex plant, a black-powder plant at Camp Minden. State Police trooper Cordell Williams said authorities evacuated everyone in a 1,000-yard radius of the plant until emergency crews were sure the situation was stabilized. Sammy Halphen, head of homeland security for neighbouring Bossier Parish, said five employees were in a part of the plant called the corning mill when the incident occurred. Approximately 1,000 pounds of black powder exploded.

All the work is done by remote control, so no one was inside the building. Ten people were evacuated from the immediate area. One person fell down during the evacuation, and was taken to the hospital.

15 June - Germany

110615-07 Döberitzer Heide, Priort, Brandenburg. A 51-year-old worker was seriously injured in an ammunition bunker in the Döberitzer Heide in Priort. The accident, the exact sequence of events and cause the police did not specify, occurred in the late morning. The underground shelter is a temporary store, used by the weapons disposal service. There, defused ammunition is stored, found in the districts of Havel and Potsdam-Mittelmark, in Brandenburg, until it is brought to the headquarters at Kummersdorf (Teltow-Fläming).

16 June - Argentina

110616-03 Puerto Belgrano, Punta Alta, province of Buenos Aires. Four people were injured when a rocket accidentally ignited at the Puerto Belgrano Naval Base. The explosion occurred in the armoury of the Infantry Battalion (BIN) 2, during the daily stock and control of the armoury, located between the Battery Base and Naval Base. The Ministry of Defence reported that an inquiry had been initiated to determine the causes of the incident, which occurred shortly after 09:00 when, for reasons unknown, the engine of a rocket was activated.

The head of Press and Publications of Puerto Belgrano, Capitán de navío Eduardo Pisciolari, said an officer, two NCOs and one civilian were injured in the accident, and were transferred to the Puerto Belgrano Naval Hospital, but were out of danger. The Second-in-Command of the BIN II, Commander and Marine Maximilian Canepa, suffered injuries on his right forearm, and underwent surgery. The other three injured persons were treated and remained under observation, according to the Ministry of Defence.

One of those injured was reported to have been a civilian priest; it was unclear what part he played in weapons inspection.

21 June - Afghanistan

110621-09 Shank base, province of Logar. A soldier from the Provincial Reconstruction Team (PRT) in the Afghan province of Logar received a light leg wound when he probably stepped on ammunition that exploded. Jana Ruzickova, spokeswoman of the general staff, said the accident occurred at the shooting range close to the Shank base at which the PRT operates, adding: "Before the shooting training started, he probably stepped on an unexploded piece of ammunition in the range complex. The explosion caused a light splinter injury to his leg. Afterwards he was treated at the Shank base. It is supposed that he will later be taken to the military hospital in Kabul". The 40-year-old sergeant major was provided first aid on the spot.

24 June - Mexico

110624-03 Jacona, Michoacán. José de Jesús Urbina Bucio was killed by the sudden explosion of gunpowder with

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which he was reportedly filling a borehole to demolish rocks on a property in the municipality of Jacona. The accident occurred around 17:30 in an uninhabited area in the neighbourhood of La Joyita. Secundino Villalvazo Gallardo, a co-worker of the deceased, said they were hired by the owners of the land to get rid of the rocky area with the use of explosives. However, when José de Jesus was about to place the dangerous material in the drilling of a huge stone, it was activated in a strange manner, and the force of the blast drove José de Jesus about seven metres, where, dismembered, he finally fell on the floor. Police were investigating.

26 June - Pakistan

110626-09 Three police officials were suspended from duties on June 29 following their admission before an investigation team that the explosion at the Gaddafi police post was caused by explosives they had stored in a warehouse at the police station. Earlier, it was suspected that the explosion was a case of terrorism.

Sub-Inspector (SI) Safdar Naseer, who was the in charge of the post, and Constables Rehmat Ali and Mushtaq told the investigation team that the explosives had been recovered from a criminal. City police officer Amir Zulfiqar Khan told local media the three said they had later released the criminal without registration of a case, but kept the explosives at the warehouse. Khan said the officials were found guilty of negligence and that strict action would be taken against them. He said the three were currently under arrest and that an FIR had been registered against them.

Khan said the explosives had gone off due to the heat inside the store room. He said more explosives were recovered from the store during investigations. He said constable Mushtaq had first disclosed to the investigators that the incident was caused due to negligence, and was not an act of terrorism. He said the SI and the other constables had later confessed to their role, adding: "Mushtaq told the investigators that he was waiting for Shabi-Baraat so he could sell the explosives in the market".

Eleven people – seven civilians and four policemen – were injured in the explosion at the police station on June 26. Police had initially said it was a terrorist attack aimed possibly at releasing three criminals locked up at the police station. However, investigations later revealed that the three had already been moved to another police station the day before. The building of the police station and some adjoining houses were damaged in the explosion.

1 July - Belgium

110701-07 Jéhonville, Bertrix (province of Luxembourg). A box of tails for mortar shells exploded around 09:00 at the Army munitions depot in Jehonville, injuring two soldiers, who were hospitalised at Libramont. The incident occurred when the box was dropped. The explosion did not propagate to any other stored munitions. With 280 partially buried bunkers – called igloos – the Jehonville base was built by the US Army to the highest NATO standards, but became surplus with the end of the Cold War. Since 1993, it has been the the Belgian Army's main munitions store, managed by the 260th Company of the Ground Component.



2 July - Spain

110702-02-A El Gordo, Castilla-La Mancha. Fabricaciones Extremeñas S.A. An explosion around 13:15 at a munitions factory in central Spain, used mainly to dismantle cluster bombs, killed one person and wounded four others, one of them seriously. Two rescue helicopters were deployed to the factory just outside the town of El Gordo, 175 km (110 miles) west of Madrid, and a wounded person was flown to Getafe hospital in the capital. Three people were taken to a hospital in Naval Moral de la Mata, a nearby town in the neighbouring region of Extremadura, and roads to the factory were closed off by local Civil Guard officers. The explosion also caused a small brush fire, which was quickly extinguished.

On July 3, the company said that the explosion occurred during the destruction of confiscated fireworks, not during the destruction of cluster bombs. The accident occurred in an incinerator, when the workers tried to free a box that had become blocked, and which contained explosives fireworks, which had been confiscated because they were expired. The blast caused a fire in the grass around the factory, which was quickly extinguished, and also damaged a nearby ship. According to the company, every year the authorities seize a large number of recreational pyrotechnics, which enter Europe illegally, mostly from Asia. Being devoid of quality control, these are destroyed in facilities such as El Gordo to prevent them from being marketed.

6 July - Colombia

110706-08 Yarumal, north of Medellín, Antioquia department. One soldier was killed and two others seriously injured by an explosion in a military complex in Yarumal, in the Antioquia department. Initial information indicated that the explosion was an accident, caused by poor handling of an explosive device, likely a grenade, by an army member. The commander of the army's 4th Brigade ordered investigations in order to establish the full

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circumstances surrounding the event. The two wounded soldiers, from the Atanasio Girardot battalion, were being attended at the Medellin Military Hospital, and the soldier's body will be transferred to his hometown of Puerto Berrio, Santander department.

7 July - Turkmenistan

110707-03-D Abadan, suburb of Ashgabat. A major explosion occurred in the town of Abadan on the outskirts of the Turkmen capital Ashgabat, causing widespread casualties and a mass evacuation. There were contradictory reports of the exact cause of the explosion: Turkmen authorities claimed that the summer heat had ignited vast stores of fireworks held in special warehouse; Chronicles of Turkmenistan, an opposition website, claimed a military armoury had caught fire.

President Gurbunguly Berdymukhamedov chaired an emergency meeting of his Cabinet and the State Security Council in an attempt to get the situation under control. As of 02:00 on July 8, the authorities had not provided television or radio news of the disaster, and only posted the following notice on the government's official Internet site at midnight after an emergency government meeting:

"Today an emergency joint session of the Cabinet of Ministers of Turkmenistan and the State Security Council of Turkmenistan was held chaired by President Gurbanguly Berdymukhamedov at which was reviewed the emergency related to the ignition of pyrotechnical goods, intended for fireworks, stored at special warehouses on the outskirts of the city of Abadam. The fire started as a result of the particularly hot weather in recent days. The heads of the military and law enforcement agencies reported to the head of state about the emergency measures taken to eliminate the consequences of the incident. There are no victims or particular wreckages. The population is being provided the necessary medical and other forms of assistance. Some of the population which lives immediately adjacent to the location of the incident have been evacuated to a safe place".

On July 8, Chronicles of Turkmenistan reported that explosions were still continuing, that dead bodies could be seen strewn around the streets, thousands were being evacuated, and that the fires could be seen from Ashgabat 20km away. Chronicles of Turkmenistan also reported panic in the streets, and widespread looting.

On July 8, eyewitnesses spoke of many people killed and injured after a powerful explosion at a weapons depot sprayed fire and ammunition throughout the town. The first explosion on July 7 afternoon destroyed some homes and buildings and set off a series of smaller explosions as bullets and bomb fragments rained down on the town. Eyewitnesses told the respected RFE/RL news service that there were dozens of casualties, most of them soldiers who were working at the military base where the armoury is located. The fire engines were unable to get close to the weapons depot because of the exploding projectiles.

Soltan Pirmuhamedov, Turkmenistan's ambassador to Uzbekistan, denied that there had been an arms dump in the town, telling Russian media: "The authorities would not in fact put an ammunition depot within the boundaries of the capital". According to Reporters Without Borders, Turkmenistan is the third from the bottom in terms of press freedom, with only Eritrea and North Korea scoring worse.

On July 9, it was claimed that it was common for people to steal ammunition from the depot and sell it, and the explosion could have been a cover-up for theft of arms sold on the black market, so the depletion of stocks would not be noticed. Abadan is only about 100 kilometres from the Afghan border.

In an interview with the Russian TV channel Rain, Ajdar Kurtov, an expert from the Russian Institute for Strategic Studies, said that the government's official version of the story – that stored fireworks ignited in the heat – was plausible because the Turkmen leadership organizes numerous festivities with fireworks, and is planning many gala events for October, the 20th anniversary of independence.

At a government meeting on July 10 in Ashgabat, Turkmen authorities admitted that 13 civilians and two soldiers had been killed in the explosion in Abadan, and after three days of claiming that the incident was only fireworks igniting, officials finally admitted that ammunition also exploded. On the official government website "Turkmenistan: Golden Age", it was announced that: "It has been established by a government commission that the ignition occurred as a result of hot weather in recent days, which led to a detonation of pyrotechnical goods, and their flight over a significant territory, in the radius of which happened to be an army warehouse, where explosives were stored from ammunition of the Soviet era which were to be recycled". The official statement also acknowledged damage to buildings.

On July 12, the independent émigré website chronotm.org published reports, said to be from reliable sources and based on eyewitness accounts, that the number of victims from the town of some 50,000 people could be as high as 1,382, a third of them children. The total appeared to be compiled from various reports of buildings destroyed and the people known to be in them and missing, including 127 homes and dozens of public buildings. According to these reports, 30 people, including newborns, died in a maternity clinic and 30 children who had gone to take a computer lesson at a school located near the power station were also killed. Only fragments of bodies remain in these cases, making it hard to identify victims.

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7 July - India

110707-04 Chintamani area, Madurai, Tamil Nadu. An unlicensed explosives warehouse was destroyed in a major fire. A security guard suffered burn injuries and was hospitalised, police said. Fire services doused the flames after a two hour battle. They also removed LPG cylinders stored in a neighbouring site. Heavy rains during the time also helped put out the fire. Fire officials said a neighbouring workshop, part of a rice mill, and some trees were damaged in the fire.

11 July - Cyprus

110711-02-C Evangelos Florakis naval base, Zygi. <http://www.euronews.net/2011/07/11/cyprus-blast-defence-minister-army-chief-resign/>, <http://www.euronews.net/nocomment/2011/07/11/massive-explosion-at-a-military-base-in-cyprus/>, <http://www.euronews.net/2011/07/11/cyprus-blast-described-as-biblical-diaster/>, <http://www.euronews.net/2011/07/11/many-killed-in-explosion-at-cyprus-military-base/>

At least 12 people were killed in explosions which rocked the main Greek Cypriot naval base at Zygi, in the south of the island. The official CNA news agency said five fire-fighters, four members of the Greek Cypriot National Guard, and two sailors were killed. The Vassilikos power plant, the island's largest electricity plant, and adjacent to the naval base, was also knocked out, causing widespread power cuts.

The radio said at least 30 people were also injured in the explosions, which it said occurred among weapons seized from an Iranian shipment aboard the Monchegorsk, a Cypriot-flagged vessel in 2009. Two containers of explosive caught fire, a police spokesman said; there were 98 containers in the depot.

The fire brigade was called to a bush fire near the base at 04:24, and that the explosions followed at 05:50, after the fire spread into the naval base. Wildfires are a frequent problem in Cyprus in the tinder dry conditions created by the searing summer heat.



On July 11, it was officially announced that twelve people died, including the commanders both of the Cypriot navy, Andreas Ioannides, and of the Evangelos Florakis naval base, Lambros Lambrou, after 98 barrels containing confiscated Iranian explosives and other munitions caught fire.

Residents of the island called for a street protest in the capital Nicosia after it became clear that the government had repeatedly been warned that the arms depot was unsafe. Police in riot gear fired several rounds of teargas outside the palace, a sprawling compound in central Nicosia, after crowds burst through an outer gate of the compound. Chanting slogans demanding the resignation of the president, some demonstrators, including right-wing

nationalists, threw stones at police guarding one compound exit. Police responded with teargas and stun grenades.

A government spokesman said it had asked the United Nations to take the explosives off its hands, sending them to Germany, Malta or UN peace-keepers in Lebanon, but had been rebuffed. However, cables revealed by WikiLeaks showed that the island's political leaders rejected offers for help in disposing of the explosives from western powers, including the United States, Germany and Britain. The defence minister, Costas Papacostas, said at the time that the material was "completely safe" and could be placed in residential areas without any risk. He has now resigned, along with the head of the National Guard, which failed to act despite a number of smaller explosions at the base. The National Guard also disclaimed responsibility for disposing of the munitions.

On July 16, the newspaper Phileleftheros published a document of the Ministry of Defence, according to which, at a general meeting on July 5 at the Ministry of Defence, the chief of the Logistics Directorate, Colonel George Georgiadis, informed the Minister of Defence, the chief of the National Guard, and the others present that on July 4 it was noticed that one of the 98 containers had been



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damaged. As a result, the doors of the container had been bent and opened, without breaking the locks. The chief of the Logistics Directorate claimed that this damage was probably caused by an internal explosion. Colonel Georgiadis said there was no way to know in what condition the inside of the container was, as it contained 130 metal cans of explosive, and maybe some or all of them had exploded. Colonel Georgiadis proposed to spray water on the containers, twice or three times a day, in order to deal with the high temperatures.

It was also claimed that in a meeting of February 7, 2011, it had been agreed to send samples of the explosives to chemistry laboratories. According to the chief of the National Guard, the Logistics Directorate arranged to send four samples to the company Hellenic Defence Systems S.A. However, the samples were not sent, because the company wanted first to acquire a necessary permit to import them, which had not been done until recently.

Representatives of the different services went to examine the containers on the morning of July 6, and everyone was surprised because, apart from the damaged containers, there was burnt gunpowder. Afterwards, they discussed about possible solutions and it was proposed to build a shelter or to spray water on the containers.



Some expressed their fear that spraying water on the containers would be dangerous, and wondered who would take the responsibility of doing it. Colonel Georgiadis tried to assure them that there was no reason to be concerned.

It seems that the representative of the Fire Services reported that the burnt gunpowder was due to the increase of the temperature, caused by fungus, caused by the humidity. They discussed spraying salt water, but the proposal was rejected by the representatives of the Fire Services, as it was considered dangerous to reduce the temperature with salt water. During the visit of the committee, a photographer of the National Guard General Staff took photos of the containers to include them in the report to the Ministry of Defence.

11 July - Pakistan

110711-04 Sihala/Sahala area of Islamabad. An explosion was reported at an arms depot near the Sihala area of Islamabad, killing at least one and wounding two others. A correspondent for Express 24/7, a local news channel, said that three extremely powerful explosions took place, and that the area was engulfed in smoke. The building housing the arms depot collapsed from the force of the blast.

Army sources said that the explosion occurred during a routine firing exercise at the depot, when a shot was accidentally fired which led to a short circuit. The short circuit resulted in the explosion. However, Faisal Memon, a senior police official in the area, said: "It was an accidental blast. An explosive device exploded when a few people were handling it inside an army depot".

Another police official, Basharat Ali, said the roof of a barracks collapsed: "It was a small room being used by army personnel as a residential barracks. Explosives were also stored there, which exploded and injured three. The injured are being shifted to a military hospital".

12 July - Russia

110712-12 Snegovaïa Pad, Vladivostok. Two persons were killed and two injured in the explosion of a shell discovered by Uzbek workers at a building site on the site of a munitions depot. According to a press release by police of the Primorsky krai [region], the workers were trying to defuse the shell so as to be able to sell the scrap metal.

14 July - Mexico

110714-05 Monterrey, Monterrey state. An explosion of a gas grenade at facilities that are used by cadets at the State Investigations Agency in down-town Monterrey left at least 50 people with symptoms of poisoning. The incident was reported around 16:10, and so far mobilized tens of Municipal and Federal Police, rescuers from the green and red crosses, and Monterrey State Civil Protection.

According to early reports, a gas grenade was apparently accidentally detonated at the top of the facilities, which caused the cadets to immediately leave the place and concentrate on an outdoor parking place. The site was covered in broken glass, apparently windows broken by the students to try to ventilate the gas that had been released.



MSIAC NEWS

WELCOME TO THOMAS KROUK

Thomas is a student at the French school of engineering, ENSTA Bretagne, where he is studying mechanical systems. He finishes his studies next year, after 6 months at the Politecnico di Milano studying aeronautical engineering.

He joined MSIAC for 6 weeks beginning 4 July 2011 as a trainee. He will be carrying out some literature work on the Floret test and Energetic materials under the guidance of Dr Ernst-Christian Koch.

He is here to work in an international environment and learn new skills in pyrotechnical systems.

He will be with us until 12th August 2011.



NEW ON OUR WEBSITE

www.msiac.nato.int

⇒ TEMPER V2.2 - see article on page 4 of this newsletter.

LATEST PUBLICATIONS

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

LIMITED PUBLICATIONS

- L-169 Ed. 2 Compendium of Interior Ballistic Codes for Guns Edition 2 by Pierre Archambault, July 2011
- L-172 Insensitive Explosives Materials: III - 2,3' - Diamino-4,4' - Azoxyfuran - DAAF by Dr Ernst-Christian Koch, May 2011

REMINDER



PARARI 2011, an international explosive ordnance symposium hosted jointly by the Australian Department of Defence Directorat of Ordnance Safety and Thales, will be held at the Sofitel Hotel Brisbane, Queensland, Australia from 8-10 November 2011.

www.parari.com.au
www.defence.gov.au/jlc/parari.html