

Lettre du



MSIAC

Munitions Safety Information Analysis Center

Newsletter



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CYPRUS MILITARY BASE EXPLOSION

On 11 July 2011 at 05:50 hrs. a huge explosion tore through the Evangelos Florakis Naval Base on the island of Cyprus. The immediate consequences were the loss of 13 personnel with 62 injured. The dead included: Captain Andreas Ioannides, the Commander of the Navy; Commander Lambros Lambrou, the commander of the Evangelos Florakis base; along with four other Cyprus Navy personnel and six civilian firefighters who had been tackling the blaze that led to the explosion. The resulting blast destroyed a nearby power plant and damaged buildings, including in the nearby villages of Mari and Zygi (at 4.5 km). Loss of the Vassilikou power station, which provides some 50% of the power capacity for the Republic of Cyprus, resulted in rolling blackouts lasting for two to three hours.

The consequences are still being felt with the economic impact estimated by the European Union Civil Protection to be up to €3 billion, which includes power station related costs of nearly €1 billion. The incident resulted in public demonstrations and political repercussions that resulted in the resignations and prosecutions, including that of the foreign and defence ministers that were in office at the time.



MSIAC has been active in gathering information related to this event and has produced an analysis based on the evidence gathered (to be available on the MSIAC secure web site). Much of this was extracted from a 600 page report produced in

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the aftermath of the incident by the Cypriot authorities, which is available at <http://media.cna.org.cy/pdf/PORISMA.pdf>. Such an event often provides useful, but painful, lessons, which we can often learn from. With this in mind MSIAC has worked to analyse the following questions:



- What was the likely cause?
- Were NATO standards adhered to pertaining to the safe storage of military ammunition (AASTP1)?
- Were the explosive effects consistent with the NEQ?
- Was the material correctly classified and were aggregation rules followed?

Before addressing these questions a little background information is useful:

- The materiel involved in the incident came from a confiscated shipment of ammunition which was seized in February 2009 as it was in violation of UN Security Council sanctions against Iran (load was on route from Iran to Syria). The load was being



Container Storage Location

transported on a Cypriot registered merchant ship, hence its final destination being Cyprus. It was stored on the Evangelos Florakis Naval Base, which met the security requirements (sabotage was a primary concern);

- the shipment consisted of 98 containers of mostly UN hazard division 1.3 gun propellant;
- Almost all the containers were stacked in one location piled 3 high with no lateral separation (81 containers contained HD 1.3 propellant; HD 1.1 fuzes were stored elsewhere but some HD 1.1 black powder may have been present);
- No environmental protection was provided;
- NEQ of the load is not clear and is estimated/reported to be 80,000-160,000kg or 481,000kg;
- The safety risks were known by some, including requirements to conduct surveillance, but were not acted upon or communicated to exposed personnel, including the base commander;
- 7 days before the incident, evidence of reaction in one of the containers was observed. Attempts were initiated to lower the temperature of the containers by hosing-down with water;
- After some 2½ years storage a sustained fire started in the morning of 11 July 2011 which resulting in a mass explosion at 05:50 hrs.

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Likely Cause

The evidence clearly points to auto-ignition of the propellant as a consequence of age related loss of stabiliser. This type of scenario has been responsible for many accidents over the years and is relatively well understood. NATO STANAG 4620 (AOP-48) details nitrocellulose-based explosives and propellants stability test procedures and requirements, which is a well established standard. The fact that no samples were analysed for stabiliser consumption meant that the evidence required to understand and act on increasing unacceptable risk was not available. Neither to prompt remediation activates which could have prevented this incident.

Safe Storage of Military Ammunition

There are a number of questions related to the storage of ammunition. Unfortunately, the decision was made to store some 81 containers of ammunition on mass with no attempt to manage the risk by separating the materiel. There was also no environmental protection, the containers were not protected from solar radiation that would have resulted in significantly elevated temperatures on those stored on the top and at the sides.



Another major question is why HD 1.3 gun propellant mass detonated. MSIAC conducted an analysis based on the evidence and it is evident that a single detonation equivalent to about 400,000kg TNT occurred (propellant NEQ 500,000kg). As mentioned earlier the shipment was known to contain a small amount of HD 1.1 (black powder) which, under the aggregation rules, would have meant that the whole shipment should have been dealt as HD 1.1. Another conclusion could be that the material was incorrectly classified. However, following the UN recommendations on classification of dangerous goods test series 6, it is, we suggest, highly unlikely that propellant would have mass detonated as it is designed to burn in a controlled manner at high pressure. It could still have given an indication of mass explosion response in the UN TS 6(b) stack test, which could result in an HD 1.1

classification. This issue does bring to light the need to look at the detonability of the material under test and the mode of initiation or ignition in the stack test (i.e. whether an igniter or a detonator is used in the UN TS 6(a) or 6(b)test).

One must also consider whether the storage conditions were unique in driving a 1.3 material to mass detonate. Does the degradation of propellants result in a change of classification or does the storage en-mass introduce a self-confinement which caused 1.3 material to mass detonate.

The consequences of this accident point to a need to better understand the risk associated with mass storage. Had quantity distances been considered, imposed for either HD 1.3 or 1.1, then the location would not have been chosen.



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WORKSHOP ON ENERGETIC MATERIALS
25 JUNE 2012
FRAUNHOFER ICT, PFINTZTAL, GERMANY

SHOCK & THERMAL SENSITIVITY TESTING

In NATO AC/326 membership countries the qualification process of energetic materials should occur in accordance with STANAG 4170 - "Principles and Methodology for the Qualification of Explosive Materials for Military Use" and the supplementing AOP-7 - "Manual of Data Requirement and Tests for the Qualification of Explosive Materials for Military Use".

Disregard the fact that these are generally agreed and acknowledged procedures of the test results sometimes prove inappropriate for further interpretation. This situation is often encountered in the assessment and prediction of full-scale response of stores towards thermal stress and shock.

Being aware of these deficiencies is the purpose of this workshop and to identify shortfalls in current thermal and shock sensitivity testing of explosives.

After a lecture session that will familiarise the audience with the underlying phenomena on a molecular/microscale as well the effects on the macroscale, the participants will have the opportunity to contribute to two parallel working sessions to either of the topics (shock/thermal) to identify shortfalls and recommend remedial measures.

To register and to complete the questionnaire to help us identify the most significant problems in the field of both shock and thermal testing go to <http://www.msiac.nato.int/products/2011-10-24-13-46-40/emq-2-registration>.

Your answers will be compiled in an information package and provided to you in advance for the workshop.

AGENDA

9:00	ICT/MSIAC Welcome
9:15	Dr. Ruth Doherty, NSWC-IDH Plenary Talk: Shock Sensitivity Testing of Energetic Materials
10:00	Dr. Bill Proud, CDL Cambridge Microscale Processes of Shock Ignition of Energetic Materials
10:30	Dr. Richard Bouma, TNO Energy Fluence and Shock Sensitivity Testing of Explosives
10:30-11:00	<i>Break</i>
11:00	Dr. Manfred Bohn, Fraunhofer ICT Molecular Processes of Thermal Ignition of Energetic Materials
11:30	Dr. Gerhard Krause, ISAFEM GmbH, Berlin Cook off testing of Energetic Materials
12:00-13:00	<i>Lunch Break</i>
13:00	MSIAC Introduction of Working Group Moderators (NN, NN)
13:15	Session 1
14:30-15:00	<i>Break</i>
15:00	Session 2
16:00	Presentation and Final Discussion
17:00	End

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

FRANCE PROCURES NAVAL AMMUNITION FROM DIEHL

www.diehl.com -06/02/2012)

Diehl Defence received an order from France regarding the development and delivery of modern naval ammunition. It is a refined variant of the 76mm x 636 naval ammunition for OTO Melara guns. It will be deployed on the newest frigates FREMM and HORIZON of the French Navy. Differing from the previous designs, the new 76mm ammunition deploys insensitive explosives preventing self-detonation of the ammunition if exposed to enemy fire or fire on the vessel thus increasing the crew's safety.

NEXTER INKS MULTIYEAR AMMO PACT WITH FRENCH MOD

www.defensenews.com - 20/01/2012)

Nexter Munitions has signed a multiyear contract worth an initial 138 million euros (\$178 million) with the Direction Générale de l'Armement (DGA) procurement office to develop and produce large caliber ammunition. The first tranche order is worth 138 million euros, with conditional tranches.

Under the contract, Nexter will be responsible for development, qualification and production of 100mm shells for the Navy, and 105mm, 120mm and 155mm for the Army, with delivery in stages to 2019.

The contract reflected a response to the operational needs of the forces, based on recent lessons learned.

The orders covers development and qualification of 155/52-caliber illumination and smoke shells, supply of modular charges for Caesar artillery, supply of explosive 120mm cartridges for the Leclerc tank, and 105mm practice cartridges for AMX 10RC armored vehicles. The deal also restarts production of 100mm cartridges for the French Navy.

RAYTHEON AWARDED UK MOD PAVEWAY IV REPLENISHMENT CONTRACT

raytheon.mediaroom.com – 03/04/2012)

The UK Ministry of Defence (MOD) has awarded Raytheon UK a replenishment contract for Paveway IV, the latest generation GPS precision-guided munition, as part of a 60 million pound contract. Raytheon UK is focused on a technological growth path which, under the UK MOD's SPEAR (Selective Precision Effects at Range) CAP 1 program, will enhance the system's capability with low collateral and penetrator warhead options, enhanced moving target capability and enhanced range.

The Paveway IV weapon system provides a low-cost, day-or-night, all-weather, general purpose precision bombing capability. Compared with standard 500-pound class weapons, the Paveway IV include: insensitive munition warhead with increased penetration; delayed arming to minimize collateral damage and GPS anti-jam

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resistance via inertial-only guidance mode. Paveway IV warhead is close to BLU 111 (PBXN-109 with RS-RDX). It should exhibit a type V reaction in slow cook-off, fast cook-off, bullet impact and fragment impact but should detonate in sympathetic reaction configuration.

Paveway IV is integrated onto the Tornado GR4, Eurofighter Typhoon and the Joint Combat Aircraft.



Paveway IV Loaded on a RAF Harrier GR.Mk 9A at Kandahar in

ACQUISITIONS

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

EXPAL WILL BUILD A CENTER OF EXCELLENCE IN PROPULSION RESEARCH AND DEVELOPMENT IN MURCIA

(www.maxam.net – 30/01/2012)

EXPAL, MAXAM's principal defence business unit, will invest over three million euros in order to construct a Center of Excellence in Propulsion Research and Development at the Fuente Alamo (Murcia) Technology Park. These R&D facilities, the first of their kind in southern Europe, will be devoted to developing innovative new applications for this material, including propellants that generate less smoke; nitrocellulose pods; low vulnerability compositions; and rocket motors for missiles and both low and medium range launchers.

EXPAL will invest over 3 M€ in the Center of Excellence for Propellants in order to ensure its status as a highly equipped research facility. Researchers will work together with experts in the field within the Center, where they will conduct development investigations and direct the trial sessions that are required prior to the full production and industrialisation of new products.



LATEST PATENTS OF INTEREST



US008119679B2

(12) **United States Patent**
Kim et al.

(10) **Patent No.:** **US 8,119,679 B2**
(45) **Date of Patent:** **Feb. 21, 2012**

(54) **METHOD FOR PREPARATION OF
2,4-DINITROIMIDAZOLE WHICH IS AN
INTERMEDIATE FOR INSENSITIVE
MELTCASTABLE MOLECULAR EXPLOSIVE**

(52) **U.S. Cl.** **514/398**; 548/327.1; 548/327.5

(58) **Field of Classification Search** 548/327.1,
548/327.5; 514/398

See application file for complete search history.

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(56) **References Cited**

U.S. PATENT DOCUMENTS

5,387,297 A * 2/1995 Damavarapu et al. 149/109.6

OTHER PUBLICATIONS

Bracuti, A.J., "Crystal Structure of 2,4-dinitroimidazole (24DNI)",
Journal of Chemical Crystallography, 1995, pp. 625-627, vol. 25, No.
10, Plenum Publishing Corporation, USA.

* cited by examiner

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(*) 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.: **13/042,698**

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

(65) **Prior Publication Data**

US 2011/0275830 A1 Nov. 10, 2011

(30) **Foreign Application Priority Data**

May 4, 2010 (KR) 10-2010-0041972

(51) **Int. Cl.**
A61K 31/4168 (2006.01)
C07D 233/91 (2006.01)

(57) **ABSTRACT**

The present invention provides a method for preparing 2,4-dinitroimidazole, wherein separation of 1,4-dinitroimidazole in powder form is avoided so that it is possible to eliminate allergy problems in workers and simplify the process, thereby improving process economy.

2 Claims, No Drawings

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

ACCIDENTS REPORTING

18 November –13 March 2012

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

23 November - Argentina

111123-09-A San Pablo, Ohuanta. Servicios y Aventuras S.R.L. Around 08:30, a powerful explosion destroyed part of an ammunition factory, leaving two workers dead, and two injured who were transferred to the hospitals of Santiago del Estero and Balcarce. At the time of the accident, there were about ten people working in different places in the plant, and only four suffered any consequences.

Comisario (Chief Inspector) Mario Ledesma, Deputy Chief of West Regional Unit, and Comisario Nestor Osoros, fire chief, inspected the scene of the accident and closed the site until the Court determines whether security measures are sufficient for the factory to continue working. Ledesma said experts of the Fire Explosives section will determine what caused the accident, and the accumulation of evidence to determine who was responsible for the fact. About the lives lost, said the Comisario, the medical examiner will determine the effect that caused the explosion, and whether the workers were with proper attire at the time of the accident.

On November 24, it was reported that the incident occurred as the workers were using a cartridge loading machine. Ledesma said the explosion occurred at 09:30 "in the cargo sector, where the machine was being operated." The company, Servicios y Aventuras, produces explosives, ammunition, and pyrotechnic products.

28 November - Australia

111128-03 Fort Cooper, Queensland. A truck carrying 38 tonnes of ammonium nitrate explosives caught fire and burned on a north Queensland road. A Department of Community Safety spokesman said authorities set up a 1km exclusion zone around the truck, which caught fire about 15:00, on the Suttor Development Road at Fort Cooper, northwest of Nebo. Fire-fighters were waiting for the fire to burn out, and police said they expected the road to be closed for some time. The truck driver managed to escape without serious injuries.

3 December - India

111203-03 Khadki, Pune, Maharashtra state. Ammunition Factory, Khadki (AFK). The death of a 30-year-old employee in a sudden fire at the sensitive L3 section of Ammunition Factory, Khadki (AFK) on December 3, led to apprehension among the staff, who even conducted a yagna – a Hindu sacrifice – to prevent any repeats. The employee, Tejas Daulatrao Mule, who sustained 80-90 per cent burns, died on December 8.

Describing the fire as a serious incident that could have burnt down the entire L3 section, AFK officials said experts looking into the incident have not yet identified the cause of the fire. Mule, a permanent employee, was described as a highly skilled worker. The incident happened around 14:10 when he was about to go for lunch. AFK officials said there was a spark and suddenly Mule was on fire. Showing presence of mind, Mule sprinted towards a water tank and doused the fire. The employees now hail Mule as a martyr who saved them. The area was immediately cordoned off and the L3 section temporarily shut down.

AFK general manager B M Singh said an inquiry committee is looking into the incident, noting: "It was an incidental accident. Nothing can be said at this point unless the probe is over". He, however, dismissed fears that the incident could have led to a major mishap.

Mule was working on the machine that generates .380 balls. [Presumably .380 ball cartridges]. There were empty cartridges and ammunition stock in the section. AFK officials said that if the "sympathetic fire" had spread, it could have completely destroyed the L3 section, explaining: "The fire is caused if the room temperature rises and generates static electricity".

4 December - China

111204-02 Shangjie village, Zhenxiong County, Yunnan Province. Four villagers were killed and another one injured when an explosion tore apart a village house in southwest China's Yunnan Province. The accident, which happened at about 10:30, was caused by explosives that had been stored in the house, according to an official from the county government. The injured person was admitted to a local hospital.

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8 December - Ecuador

(<http://www.youtube.com/watch?v=vhFLOaXdyy0>)

111208-03-D Pusuquí sector, north of Quito. Police College General Alberto Enríquez Gallo. Children and police were injured in two explosions at about 11:15 in the powder magazine of the Grupo de Intervención y Rescate (GIR – Intervention and Rescue Group), located at the rear of the General Alberto Enríquez Gallo Police College in Pusuquí sector, north of Quito.

Interior Minister Jose Serrano said there were 12 wounded, including four children who were in a daycare facilities of the Ministry of Social Inclusion, located about four blocks from the police arsenal. According to the Ministry of the Interior, by noon eight cadets injured with cuts from glass, who are in stable condition, a police sergeant and a civilian, had officially entered the Police Hospital. They were joined by four others who were transferred to the Baca Ortiz hospital. The blast wave expanded to a radius of approximately 1 km, and there were windows in homes affected in and around the barracks. A nursery is located about four blocks from the incident, where a child suffered an injury to his hand, and broken glass was also found in the cribs.



On December 10, the co-ordinator of the Ecuadorian Red Cross, Henry Ochoa, said the number of injured had risen to 41, but most of the injured people had “minor injuries caused by the hit of objects, cuts and ear problems”, and only one person had second degree burnings and was still hospitalized. The death toll of the explosion in Pusuquí, in northwest Quito, remained four.

On December 13, following a government order prohibiting any statements to journalists concerning the explosion, local media, citing the head of the Quito Fire Brigade, Colonel Fernando Ordóñez, revealed that the GIR did not have the necessary permits required to keep explosives on site.

Furthermore, in an interview with state TV (ECTV), the Secretary of Homeland Security in Quito, Lourdes Rodriguez, said that the Municipality also had not known that there were explosives in the GIR: “I have reviewed what existed in La Delicia Zonal Administration and, indeed, it was not known there was a bunker or a powder magazine. It’s true. There was no knowledge and therefore there was no specific plan”.

On December 14, Defence Minister Javier Ponce said the police did not inform the Ministry that there were explosives storage areas at the headquarters – despite the fact that the Regulation to the Law on Arms, Ammunition, Explosives and Accessories provides that Defence has all powers for inspection. According to Ponce, the military has the responsibility for monitoring, provided that institutions report the existence of such areas. Asked if the military controlled the bunker, the Minister was adamant and said: “Absolutely not. That was the sole responsibility of the police”.



Minutes later, the Security Secretary of the Municipality of Quito, Lourdes Rodriguez, said the GIR was required to report in the Joint Command of Armed Forces (COMAC) the existence of explosives. In fact, Article 70 of the munitions rule states that: “For the storage of explosives, the Joint Chiefs approve the location of deposits or magazines, the technical and safety conditions to be met, and the explosives that may be stored in them”. In addition, the Defence Act states that “it may prohibit, temporarily or permanently limit the activities, quantities of arms, ammunition and explosives for civilian, State or private commercial purposes”. Hence, Minister Ponce said that all the information related to explosives or weapons have to be considered by the Joint Staff.

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Furthermore, the GIR also required permits from the Fire Department and the Municipality of Quito, who also were not aware of the existence of the bunker that exploded. To this must be added that officials have no clear information about whether the police station premises were insured or not.

11 December - Israel

111211-03 Elikim, northern Israel. Israel Defence Forces (IDF). A resident of northern Israel was killed during a munitions test at the Israel Defence Forces base at Elikim. The IDF said that the civilian's death was caused by a bullet during a test at the training base. The incident was being investigated by the army and police.



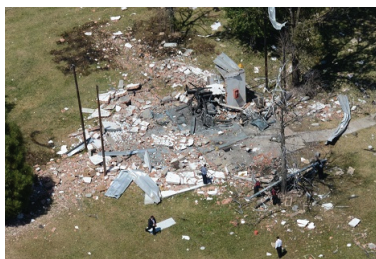
22 December - Canada

111222-03 Repentigny, Quebec. General Dynamics. Around 15:15, an explosion was heard at the General Dynamics site in Repentigny. The deflagration was heard several kilometres from the munitions factory, and the emergency services were inundated with reports of an unidentified explosion.

According to the company, the explosion occurred on an area belonging to General Dynamics, and reserved for the testing of munitions. According to Philippe Robert of the General Dynamics public relations: "However, this explosion was much stronger than usual".

The Repentigny fire department sent fire-fighters to the area, but they had difficulty locating the site of the explosion because the plant delayed reporting it. Fire-fighters left the area around 15:40. General Dynamics said it would hold an internal inquiry to determine exactly what happened. No employees were injured, and no buildings were damaged.

27 December - Argentina



111227-06 Rafaela. Foti Manufactura Argentina de Pólvora SA (Fomapsa). One person was killed and one seriously injured in an explosion around 09:30 at Foti Manufactura Argentina de Pólvora SA (Fomapsa – Foti Powder Manufacturing Argentina). The tragedy occurred four years after an accident in similar characteristics that left four dead in August, 2007. [Hint 07-08a, 070802-05.] The provincial police chief, Inspector-General Hugo Tognoli, said the explosion apparently occurred in a sieving machine, where the powder is mixed with chemicals. Police sources said other people at the scene were slightly injured in the blast.

2 January - Turkey

120102-02 Central Anatolian Kirikkale province, Yahsihan district, Yahsihan. An explosion killed four workers in a four-storey building used as a munitions depot by the Turkish Armed Forces. The powerful explosion, which was heard from the Kirikkale city centre 25km away, occurred at 00:43. Military and municipal fire-fighters and numerous ambulances were dispatched to the munitions depot, which caught fire following the explosion. The area around the building was closed to civilians and non-essential rescue personnel because of the chemical materials burning in the fire.

The bodies of the four workers on night watch in the building at the time of explosion were found after the fire was put out. A Turkish Mechanical and Chemical Industry Corporation (MKEK) team arrived at the scene of the incident in the early morning, and stayed at the depot for many hours to prevent any further explosion. Experts said that the depot was severely damaged and in an unusable state.

9 January - Spain

120109-09 Region of Murcia, Murcia. Explosivos Alaveses. Fire-fighters controlled a fire which occurred as a result of an explosion in a pressed powder magazine inside the Explosivos Alaveses factory, in the hamlet of Javalí Viejo. Director General of Emergency, Luis Gestoso, said the origin of the explosion was still unknown, but may have been "just one of those things". Gestoso, accompanied by the Minister of the Presidency, Manuel Campos, explained that the fire was controlled, but there was a risk that there was a new explosion.

The warehouse contained 12 tonnes of intermediate product, powder in preparation. In particular, five containers of material exploded. The blast blew the roof off the factory, which was closed from 07:00.

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10 January - Bulgaria

120110-03 Near Plovdiv. Vazovski Mashinostroitelni Zavodi (VMZ) Sopot. Three workers were injured by an explosion at VMZ Sopot, Bulgaria's largest military factory, but the lives of all of them were not in danger. Two of the injured suffered only minor wounds and were being treated in the local hospital, while a third was more severely injured, and was taken to a hospital in the nearby city of Plovdiv. The explosion was not occasioned by munitions, but occurred during a routine production process due to a malfunctioning of the equipment.



Ivan Stoenchev, director of VMZ Sopot, confirmed that investigations into the incident were underway, which he described as not being abnormal. He also said that the most gravely injured worker's life was completely out of danger, but that he needed to have particles removed that penetrated his skin due to the explosion.



11 January - Bulgaria

120111-04 Central Bulgaria, near the city of Gabrovo, village of Charkovo. A woman, 49, died and a man was injured in an explosion in an ammunition factory in the village of Charkovo, near the city of Gabrovo. The incident – the second incident involving explosives in two days – occurred around 08:00 while the two were handling some explosives. According to the Interior Ministry's press centre there was no danger of further explosions.

The woman died on the spot; the man was listed in the local hospital with non-life threatening injuries. The two were alone inside the space where the explosion occurred. The woman had been handling gunpowder, which exploded in her hands. Experts on detonations were examining the location, which is in the woods, far away from the city. The private company has foreign shareholders.

Inspector Denislav Donkov, from District Police Directorate – Gabrovo, said violation of technological rules for separation of the component parts of ammunition, and improper treatment were the likely causes of the explosion.

25 January - Philippines

120125-02 Manila, suburban Taguig city. An artillery round accidentally exploded while a welder and police commandos tinkered with it with an acetylene torch, killing four people, including two policemen. Police Senior Superintendent Tomas Apolinario Jr. said ten other people, including another policeman, were wounded in the powerful explosion in a scrap metal shop in suburban Taguig city, where the police brought the shell, apparently to have it defused and opened. Investigators were trying to determine where the police got the artillery round, and why they brought it to an ironworks shop outside a police camp in Taguig instead of handing it to ordnance experts, who can safely defuse it, said Apolinario, who heads the Taguig police force, adding: "There was a procedural lapse in the way they handled this artillery round". The sprawling police camp in Taguig, southeast of Manila, used to have a depot for unexploded munitions and old bombs, but a huge, accidental explosion at the site forced authorities to close it years ago. Apolinario said the policemen failed to defuse and open the artillery round with a wrench, prompting them to bring it to a welder.

25 January - Thailand

120125-03 Nakhon Sawan province, Payuhakiri district. Army Ordnance Directorate. A large fire broke out around 11:00 at an Army weapons depot in Nakhon Sawan province. After initially denying the incident, Army officials said there had been a fire, but said it caused no explosions or casualties.

The incident was first reported before noon by amateur and CB radio operators, calling for donations of blood for people wounded in an explosion. The depot, supervised by the Army's Ordnance Directorate, later issued a statement admitting that there had been a fire caused by phosphorus left in old wooden boxes. Two Army fire engines were dispatched from a nearby unit, and reportedly put out the fire. Depot officials said there were no injuries, and refused to give any other details.

At 15:30, Army spokesman Colonel Sansern Kaewkamnerd said the fire started when phosphorous in a number of old wooden boxes used to store weaponry and munitions, and which had been prepped for destruction, combusted after being exposed to direct sunlight when the boxes were scattered outdoors. About 100 boxes were destroyed or damaged by the fire, and a building damaged. Sansern repeated a statement that there were no injuries and that no weapons were destroyed or damaged, adding: "The Army commander has been informed of the incident

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and has issued no special order regarding the matter". Prior to the fire, officials conducted a periodic check of weapons' shelf lives. Those items whose service life had expired were removed, which were scattered outside in preparation for demolition.

10 February - Lebanon

120210-06-A Tripoli, Abi Samra neighbourhood. A munitions warehouse exploded in the northern Lebanese city of Tripoli, killing three Syrians. The state-run National News Agency (NNA) said that the Lebanese Army had been struggling to contain clashes that erupted between supporters and opponents of Syrian President Bashar al-Assad in the coastal city that morning.

It was reported that the three victims, all security guards, lit a fire to warm themselves near containers that stored munitions, without being aware of the contents, causing an explosion at the privately run facility. NNA reported earlier: "A major explosion ripped through an arms depot belonging to Ghaleb B. near Al-Jinan University in Tripoli".

On February 11, Al-Mustaqbal Movement official Mustafa Allouch denied that the arms depot that exploded belonged to his party, noting: "It's not unusual that some sides always try to accuse us of lies." Allouch denied the alleged accusations by deputy head of the Arab Democratic Party Rifaat Eid, adding: "We urge the competent authorities to follow up the incident and bring those responsible to the Lebanese judiciary". According to local newspapers, the owner of the farm that witnessed the explosion denied knowing of the existence of such a depot on his property. Security forces said they were awaiting an improvement in the health of the wounded in the blast in order to begin investigations with them.

On February 12, Future Bloc MP Mouin Merhebi held Syria and Hezbollah responsible for arms warehouses in North Lebanon's Tripoli.

16 February - China

120216-11 Hebei Province, Tangxian County, Shangzhuang Village. Four people were killed and another was injured in an explosion as they were trading detonators illegally in north China's Hebei Province. Tangxian County authorities said the explosion occurred around 12:40 in Shangzhuang Village. Initial investigation showed the five people were trading detonators when one device exploded accidentally. Four of them were killed instantly and another was injured. Officials said the injured man is now in hospital for treatment. The blast caused little property damage, and the police are investigating the case.

20 February - USA

120220-02-A PA, Jamestown. Combined Systems Inc. A fire broke out at the Combined Systems plant, which produces tactical munitions and crowd control devices, and was also the scene of a fire in November, 2011. [HInt 11-11a, 111115-02.] Chief Operating Officer Richard Edge said a fire broke out in one of the production buildings around noon. At least 10 people were working inside at the time, but no one was injured in the blaze. More than seven area fire departments responded to the fire, and although it was under control in a little more than an hour, fire-fighters remained on the scene throughout the afternoon. Edge said the fire most likely started with an equipment malfunction, but it was still too early to tell. He said standard safety procedure is to evacuate the whole complex in the event of a fire, so all of the more than 200 workers on site were evacuated, and then most were sent home for the day.

On February 21, it was reported that the federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) was investigating the fire at the tear gas plant that has been the target of Occupy protests and a cyber-attack by a hacker group in recent months. Special Agent Steven Bartholomew, a spokesman for the ATF, said that agency was taking the lead investigating the fire. Bartholomew said the fire probably started during a mixing process and involved an equipment malfunction, and there might have been an explosion before the fire. He said he was unsure what chemicals were being mixed.

22 February - India

120222-05-A Goa state, Vasco port. Mormugao Port Trust. Goa Shipyard Ltd. Five persons were injured when a shell exploded at a defence shipyard in the port town of Vasco. The shell had been recovered by a dredger vessel, used by Mormugao Port Trust at the Goa Shipyard, along with silt and dirt which was then emptied in a container. Superintendent of Police Arvind Gawas said workers at the shipyard tried to cut open the shell, whereupon it exploded. Five workers were injured in the explosion, and they were admitted to a local hospital. The condition of two of them was said to be critical, Gawas said. Indian Navy officials have visited the site and requested that the

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shell be sent to them for further examination.

On February 23, three more shells, probably more than two decades old, were found in the mud inside the dredger being repaired at the Western India Shipyard dock port after four workers were injured in an explosion. The three shells have been sent to the naval armament depot in Dabolim while investigations are on.

S M Paranjpe, chief inspector of factories and boilers inspectorate, said: "Action will be initiated against the management after the report regarding the incident is received from Mormugao police inspector". He said the workers erred in not reporting the matter to the concerned authorities at the work-shop, but the management shares the blame in not supervising the work. The repairs apparently involved cutting out the corroded part of the vessel for replacement. During repairs workers found a shell.

The vessel had been stationed near Karwar beach before its arrival at Mormugao port. Sources said armament shells used in firing practice may have fallen on the sea bed and during dredging may have mixed with the mud, which remained stuck to the vessel.

26 February - Philippines

120226-08 Marikina City, Barangay Fortune. Arms Corporation of the Philippines (Armcor). A fire, believed to have been triggered by high ambient temperature, destroyed the storage room of a fire-arms and ammunition firm in Marikina City. Authorities were alerted to the fire at 13:45, when thick smoke billowed from the compound of Armcor, followed by a loud explosion. Arson investigator Senior Fire Officer 1 Noel Guiyab said that fire-fighters managed to contain the fire in the ware-house, although it reached the second alarm before it was put out at 14:27. Guiyab said: "There was also a fire wall around the warehouse, which prevented the spread of the fire to the residential houses nearby". The fire destroyed gunpowder and other company equipment worth P1 million.

4 March - Republic of Congo

<http://ireport.cnn.com/docs/DOC-757562>, <http://www.bbc.co.uk/news/world-africa-17249480>



120304-01-B Brazzaville. At least 150 people were killed in a series of explosions which began shortly after 08:00 and continued into the early afternoon at a munitions depot in Brazzaville, and the death toll was expected to exceed 200. Panic spread across the city and as far as Kinshasa, the capital of the neighbouring Democratic Republic of Congo, and at least 2000 people fled their homes. Both governments called for calm and said it was an accident. A hospital reported at least 237 people were wounded.

Citing Defence Minister Charles Zacharie Bowao, state radio said the explosions had been caused by a fire in the arms depot in the Regiment Blinde [Fr. Armoured Regiment, Ed.] base, in the Mpila city zone. The explosions were set off by a fire in two munitions depots at the Mpila armoured brigade barracks, according to soldiers who declined to be named. A diplomat said that the incident "is not political and the president (Sassou Nguesso) is with the chief of staff to co-ordinate operations". There was no official word from the government on the cause of the explosions, or damage sustained. A diplomat said fire-fighters were finding it hard to fight the fire because of continuing explosions. River traffic between Kinshasa and Brazzaville was suspended, a Kinshasa port official said.

The Chinese state Xinhua news agency said about 140 Chinese workers from the Beijing Construction Engineering Group were working near the munitions depot when the blasts occurred. The dormitory building of China's Huawei company was badly damaged, but there were no casualties reported there, Chinese officials said.

Late on March 4, government spokesman Bienvenu Okyemi said the incident was caused by a short-circuit that led to a fire. The main fire was now under control, he said, though a number of buildings were still burning. However, French-language reports on March 6 said the fires were threatening a second underground munitions store less than 100m from the one that exploded.



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On March 6, state radio reported that at least 246 people had died. Police said international fire-fighters had brought the main blaze under control by that morning, and prevented it from spreading to a second munitions depot just 100m away. The second depot contained even heavier-calibre weapons, including multiple rocket launchers. It remained unclear whether rescue efforts could start in earnest, nearly three days after the first explosions. A military source said there were plans for the controlled destruction of the munitions in the second depot, which would delay any attempts to dig into the rubble to find possible survivors or bodies.

On March 7, fears of further explosions still prevented rescuers from reaching any survivors of the explosion. The International Committee of the Red Cross (ICRC) said that unexploded shells still litter the area making it too dangerous for aid teams to search for survivors in the debris.

According to the head of operations of the Mines Action Group (MAG) in Congo, Lionel Cattaneo, the Congolese authorities had been warned about the dangers of storing munitions in such a densely populated residential area. However the Congolese army, like those of many nations in a region prone to coups and armed uprisings, still prefers to keep the arms close at hand in case of any attempts to overthrow governments. Cattaneo said: "They're scared they'll have difficulties getting their munitions if they have genuine need of them. Clearly it was not ideal to keep them there. They were aware of the problems". Cattaneo said the unwillingness of some African armies to get rid of obsolete munitions means the depots will remain a danger.



6 March - USA

120306-16 AZ, Apache Junction. Four people, including two children, were killed when a mobile home owned by a businessman who reloads ammunition for vintage and obsolete firearms caught fire. The owner was not believed to be among the victims. According to Dave Montgomery of the Apache Junction Fire Department, the mobile home caught fire about 21:30. A neighbour said she heard a loud boom and called the emergency services while her husband tried to kick down the door of the burning home. When fire-fighters arrived, they were told that people were trapped inside the mobile home, but the fire had engulfed the home, and they could not get inside. Fire-fighters extinguished the blaze after about 30 minutes and found the four victims near the doorway.

Fire officials said a large quantity of ammunition exploded in the fire, but it did not pose a major threat to fire-fighters because most of it had been expended by the time they arrived. The trailer is listed in federal Bureau of

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Alcohol Tobacco, Fire-arms and Explosives licensing records as the registered address for a business called Shell Reloading, owned by Robert M. Shell. Shell is a firearms expert who has written several books and magazine articles on how to reload shells for antique or obsolete weapons.

7 March - Slovakia

120307-03-A Trencin region, Novaky. The accidental explosion of a grenade killed a Slovak soldier, seriously wounding two others, and slightly injuring a third. The incident occurred in a restricted military zone, forbidden to civilians, in the premises of the Military Maintenance Company (VOP) at the military base VOP Nováky. Trencin regional police spokeswoman Elena Antalová said the occurred while VOP workers were reviewing work in the military area.

According to one source, the incident involved claims of missing ammunition. In autumn 2011, the Slovak Army stated that ammunition was missing, but it was not clear whether the missing materiel amounted to 2 or 200 kilograms. On March 7, three civilian employees and one army pyrotechnics expert were stock-taking in the garrison at VOP when a grenade in a sealed case exploded, killing one civilian. The grenade was part of a series that the army had complained about, but which was later re-issued after supposed repairs. The men apparently had had no direct contact with the case – or grenade – before the explosion. One of the employees suffered only slight injuries and was treated on the spot; the other two were hospitalised with non-life-threatening injuries.

On the evening of March 7, Prime Minister Iveta Radicová (Slovak Democratic and Christian Union (SDKÚ)), who is also the current acting defence minister, visited Nováky together with the chief of the General Staff, Peter Vojtek. She stayed for about an hour. After talks with Vojtek, she said – according to SDKU media – that all procedures and instructions ordered for stock-taking of ammunition were observed. Investigators do not know so far what caused the grenade, which was made in 1997, to explode. She recommended that Vojtek return this series of products to the producer and that further quality checks be carried out.

Over the past five years, a series of incidents in the military base has left at least eight dead and 20 wounded. On March 2, 2007, a major explosion occurred at the same facility, in a building where old ammunition is destroyed. [HInt 07-03a, 070302-04.]

7 March - Peru

120307-04 Ayacucho region, province of Huanta, Corazonpata. The apparently accidental explosion of a grenade at a military base in the Ayacucho region, in south-east Peru, injured 10 soldiers. An army patrol was returning to base in Corazonpata, when a soldier accidentally activated a grenade that exploded and injured his companions. The Joint Command of the Armed Forces denied that it was a terrorist attack. Corazonpata base is in the Valley of the Apurimac and Ene Rivers (VRAE) where the army is fighting the remnants of the Sendero Lumi-noso [Shining Path] and drug cartels.

8 March - France

120308-05 Bouches-du-Rhône—13, Marseille, La Joliette area. Two workers on a building site in the Port of Marseille were slightly injured by the deflagration of a bomb dating from the Second World War. According to a communiqué from the Préfecture of Bouches-du-Rhône: “The weight of the bomb was estimated at a tonne, so 650kg of explosive”.

Around 10:40 a tracked rock-breaker cut the bomb in half, causing a small explosion which shocked the driver and the site foreman. The two men were taken to the Hôpital de la Conception in Marseille. Six vehicles and 25 marine fire-fighters were sent to the site.

8 March - USA

120308-08 TX, Spring. Spring Guns and Ammo. A fire that started at a shooting range was ruled accidental, according to officials with the Spring Fire Department. Around 17:30, the Spring Volunteer Fire Department got a call for fire from the Spring Guns and Ammo shooting range. When the first units arrived, heavy smoke was coming from the indoor range. While the fire was extinguished, Deputy Chief Scott Schoonover said several customers and employees had to be evacuated from the building. There were no injuries reported.

After investigation, SFD officials determined that a customer was shooting a rifle inside the range, using ammunition that was prohibited by Spring Guns and Ammo. As the customer was shooting his rifle down the range, one of the rounds set the insulation along the back wall of the range on fire. While the customer was not in

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violation of the law, Schoonover said, he was in violation of the range policy, and the fire was ruled accidental.

13 March - India

120313-09 Assam state, Baksa district, Sukhanjuli area. A mortar explosion killed two persons and injured one at the Darranga field firing range in Sukhanjuli area of Baksa district. Two died on the spot, while another person was seriously injured when a mortar shell fired by army personnel during a field firing session at the range exploded near them.

Defence PRO Lt Col S.S. Phogat, however, said the two died when an unexploded shell, which they were trying to retrieve to sell the metal casing as scrap, exploded. Such deaths are not new in the area, where residents of the villages in the periphery of the range often enter to collect unexploded shells, the copper casings of which fetch a good price in the local market. According to official data, apart from today's incident, 19 civilians have lost their lives in the range in the past five years. Local sources put the number at over 50 in the past 10 years. Phogat said the district administration and the villagers in the vicinity of the range were informed of the dates of firing beforehand, but those who were after the scrap did not pay heed. "The detonating mechanism of a fired but unexploded shell is unstable and if not handled properly can explode", he said, adding experts always exploded these shells after a day's firing.

MSIAC INPUT

BAE Staff Injured in Gun Test, 18 March 2012 (Extract from the UK Daily Telegraph Newspaper <http://www.telegraph.co.uk/news/uknews/defence/9149005/BAE-staff-injured-in-gun-test.html>)

Three BAE engineers were injured after a warship gun misfired during testing off the Dorset coast.. The men were taken to hospital after suffering minor injuries following the incident aboard the Al-Shamikh ship, which is destined for the Omani Navy.

Local reports said there was an explosion on board but BAE insisted that was an exaggeration of the incident and denied suggestions of a fire. The men were taken to hospital as a precautionary measure and discharged the same day, a spokeswoman said.



The 99-metre long ship was undergoing sea trials in the English Channel before being handed over to the Sultanate of Oman Navy later in the year. The area is used regularly for testing newly built ships.

A witness who saw the men being transferred to the ambulance said: "There was a loud explosion on board the warship. "She was on gunnery trials off Portland, when there was an explosion, sending shrapnel up. "The blast was heard seven miles away in Weymouth."

A spokeswoman for BAE said: ""An incident occurred on board Al-Shamikh while on sea trials on Sunday during test firings.

MSIAC NEWS

FAREWELL TO MARTIN VAN GOOL

Martin van Gool will be retiring this month. He has served as the Netherlands representative on the MSIAC Steering Committee since 2006. He is to be replaced by Bart Wimmers.

We wish Martin all the very best for a wonderful retirement with his wife Janny.



Wade Evans with Martin van Gool

FAREWELL TO PIERRE-FRANÇOIS PÉRON

Pierre-François joined MSIAC in September 2006 and will be leaving us in September this year to return to France. He will be taking up duties at the DGA in Paris.

We wish him and his family all the very best for the future.



Wade Evans with Pierre-François Péron

LATEST MSIAC PUBLICATIONS

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

LIMITED PUBLICATIONS

- L176 MSIAC Draft Guidance Note on the S3 Assessment of Mitigation Devices by Dr Michael W. Sharp, November 2011
- L177 MSIAC Comments on the Austrian 155mm Flick Ramming Accident by Dr Michael W. Sharp, November 2011

OPEN PUBLICATIONS

- O144 Combustion Behaviour of MTV Under Reduced Atmospheric Pressure by Dr Ernst-Christian Koch, V. Weiser, E. Roth and S. Kelzenberg, ICT, Germany, November 2011
- O145 Consideration of Some 4f-Metals as New Flare Fuels - Europium, Samarium, Thulium and Ytterbium by Dr Ernst-Christian Koch, V. Weiser, E. Roth and S. Kelzenberg, ICT, Germany, November 2011
- O146 Combustion Behaviour of Binary Pyrollants Based on Mg, MgH₂, MgB₂, Mg₃N₂, Mg₂Si and Polytetrafluoroethylene by Dr Ernst-Christian Koch, V. Weiser, E. Roth and S. Kelzenberg, ICT, Germany, November 2011
- O147 A Discussion on International Harmonisation of the Safety and Suitability for Services Assessment by Dr Michael W. Sharp, November 2011

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