



## Fireworks shows: Vigilance required before, during and after!

Every year, accidents occur during the July 14 and August 15 French holiday festivities. In 2015 unfortunately, reports came in of 11 injured in Monteux, 15 injured in Canet and 5 more in Castelsarrasin during fireworks shows that went awry.

Yet these risks are not confined to the actual launch itself! Incidents also arise during the storage period preceding the show, often owing to the fact that regulatory requirements and safety rules have not been respected.

To guarantee the public's safety, rules of caution must be applied by all parties involved in the organisational chain of command for staging fireworks: local authorities, pyrotechnicians, but also spectators!

### 1. Before the show: Fireworks storage

Undeclared storage depots are often associated with inadequate safety conditions, as illustrated below.

#### 22 August 2013 - SAINT-GEORGES-D'OLERON (ARIA 44227)

Fire broke out in a pyrotechnician's garage where a local association's recreational fireworks had been stored. The 90 m<sup>2</sup> building serving as the manufacturing shop was entirely destroyed. That morning's use of a grinder in the same room had created a hot spot, which in turn ignited the numerous combustible substances stored on-site (cardboard, plastics, etc.), including fireworks that had been kept in a locked cabinet. The association, which often launched fireworks during the summer period, had not declared its activity or the storage facility to authorities. Moreover, the best fireworks storage practices and relevant safety rules had not been applied (safety distances not respected, presence of flammable materials and a gas bottle, hot spot works in the vicinity, etc.).



#### Fireworks shows: Regulatory requirements

The organisation of a fireworks show is overseen by the [decree enacted on 31<sup>st</sup> May 2010](#), and its [implementation order dated 31 May 2010](#), relative to the acquisition, storage and use of recreational fireworks and pyrotechnic articles intended for staged entertainment.

**All fireworks shows must be declared by the organiser to the pertinent Prefecture and town hall at least one month ahead of time.** This declaration is to contain, among other things: the name and certifications of the person handling the launch, the total quantity of active material and types of explosives used, plus if applicable the name of the person responsible for their temporary storage prior to the show.

**Beware of accidental situations likely to arise when regulatory requirements are not respected!** The show organiser assumes responsibility for the proper application of these regulations.

#### Areas of enhanced vigilance regarding fireworks storage prior to the show (2 weeks before the scheduled date):

##### Declaration :

- Should the storage room be made available by the show organiser, has this other party been indicated (manager's name, venue) in the declaration filed with local authorities?

##### Building location and characteristics:

- Is the storage zone isolated (in order to prevent the risks of spreading in the event of an accident) and located within proximity of the show venue (less than 50 km away, in order to limit vehicles loaded with explosives on the roads)?
- Is the room closed, restricted to public access and monitored around the clock?
- Has it been designed with materials and coverings (floors, walls, ceilings, structural frame) adapted to the products in storage, by ensuring avoidance of reactions in the event they cause contact, shock or friction?
- Does it offer easy access to emergency services? Are appropriate extinguishers available within immediate reach?

##### Storage practices:

- Is the storage space solely dedicated to receiving pyrotechnic materials? If such is not the case, the fireworks must be isolated from all other items (with at least 3 m of unencumbered space). Under no circumstances can the room contain any other flammable or hazardous materials.
- Are the fireworks stacked in a stable configuration with assurance of their mutual compatibility? Is the packaging labelled with all requisite indications: name, symbol, risk category? Has a log been created for the products present? Are products placed away from all heat or ignition sources? Are all building or repair works prohibited over the storage period?

## 2. During: As the fireworks show unfolds

The following examples highlight the risks involved should errors arise when handling fireworks and in selecting the launch zone.



### 14 July 2004 - NARBONNE (ARIA 27572)

Rockets fired during the Bastille Day fireworks celebration set ablaze pallets and miscellaneous chemical substances (cans of paint, solvents, empty LPG bottles, etc.) in the 3,000-m<sup>2</sup> outdoor storage area of a large hardware store. Two explosions occurred. Three lorries, one car and a forklift were also destroyed in the blaze. Firefighters were able to protect the store itself as well as a large retail complex in the immediate vicinity. Damage was appraised at several hundreds of thousands of euros.

### 13 July 2004 - ALENÇON (ARIA 27553)

An accidental launch of the full set of fireworks being installed for the July 14th festivities injured 3 pyrotechnicians, all of whom required hospitalisation. The accident was due to poor handling by one of the 3 team members.

The assembly and launch of fireworks for the event are to be supervised by the person responsible for setting up the show. The professionalism of the pyrotechnician hired by the organiser is thus determinant in guaranteeing high-quality entertainment under optimal safety conditions.

### Areas of vigilance when judging a pyrotechnician's skills:

- Has the fireworks coordinator been certified for the specific types of products used during the show? Is he/she experienced (submission of a list of the most recent shows as participant or supervisor). Have the individuals actually launching the fireworks received all the requisite qualifications?
- Were all necessary precautions taken when choosing the fireworks launch site? Has the calculation of safety distances adopted during the assembly and firing been explained and justified in detail in the permit application filed?
- Have the conditions governing electrical and pyrotechnic connections been provided in detail, along with the installations where these operations are taking place?
- Have the site and conditions for storing products both before the show (in the event a dedicated room has not been proposed by the organiser and the pyrotechnician has made his/her own plans relative to this step) and after the show (defective fireworks, spare supplies, residue from spent fireworks, etc.) been specified?

## 3. After the show: Managing the return of explosives

Upon completion of the show, the firing zone must be thoroughly cleaned: all fireworks waste must be collected and the unused pyrotechnics handled in an appropriate manner. Accidents can also occur once the show is over.

### 8 June 2000 - FOUQUEYROLLES (ARIA 17751)

An explosion destroyed a 200-m<sup>2</sup> farm building just 1 km from a pyrotechnics plant manufacturing fireworks, which had been housing pyrotechnic products and accessories (300 kg of fireworks, various types of explosive powders, etc.) and had been used as a workshop. Subsequent to the tremendous December 1999 storm and cancellation of many fireworks shows, the farmer had stored his excess fireworks in the barn on the property without first seeking a permit. The fire broke out following a short circuit on a spent battery of fireworks. The farmer was tried and convicted for failure to seek authorisation and for regulatory non-compliance.

### 3 August 1998 - BILIEU (ARIA 13371)

A powerful blast followed by several explosions and a fire occurred during the transfer, in a light-duty vehicle, of fireworks temporarily stored in a barn. The bodies of 2 adults and a child were found in the building rubble. In accordance with regulations, fireworks that go unspent due to poor weather were to be returned to the manufacturer. This accident may have been caused by a lighter inadvertently placed on a rocket that had triggered subsequent to a shock or by an equipment design defect.

The "returning explosives" and "duds" (fireworks launched that fail to go off during a show) must be handled with great care. While their state may appear to be as good as that of a new firework, they may still display heightened sensitivity (possibility of active material traces on their casing, thereby increasing their ignition risks). The pyrotechnician must therefore plan on introducing a procedure to handle these items upon completion of a firing round: instituting a wait time before disassembly, immersion in water to favour inerting, adequate packaging for transport, etc.

**For further information** on the regulations associated with fireworks shows (in French):

<http://www.developpement-durable.gouv.fr/Missions-du-ministere-en-matiere.html>

<https://www.service-public.fr/professionnels-entreprises/vosdroits/F22235>

**For all comments/suggestions or to notify of an accident or incident:** [barpi@developpement-durable.gouv.fr](mailto:barpi@developpement-durable.gouv.fr)

**The summaries of accidents recorded in the ARIA base may be consulted at:** [www.aria.developpement-durable.gouv.fr](http://www.aria.developpement-durable.gouv.fr)