

Pallet fire in a combustible materials warehouse

24 April 2018

Andrézieux-Bouthéon (Loire)
France

Fire
Warehouses
Handling
Organisation
Procedures /instructions
Internal contingency plan

THE INSTALLATIONS CONCERNED

The site:

The company where the event took place operates a warehouse in the municipality of Andrézieux-Bouthéon which is subject to authorisation under heading 1510 of the nomenclature of classified installations. The company employs approximately 172 people and about 60 temporary workers (depending on the time of year). It operates from Monday to Friday, with working hours from 6 a.m. to 12:15 a.m., with order-picking operations performed by two operational shifts from 6 a.m. to 1:15 p.m. and from 1:30 p.m. to 8:45 p.m. During periods of high activity, the operations can be occasionally organised into three eight-hour shifts.

The storage area is dedicated to an online sales operator (large household appliances). The rest is used for storing products intended for the "home environment": garden furniture, DIY, mattresses, sofas, etc.

The warehouse:

The logistics platform (1 level) is served by road and rail. It consists of one 8,640 m² bay and eight 7,200 m² bays separated by 2-hour firewalls. The building was built in June 2004. The total volume of goods stored is 666,374 m³ representing 40,867 tonnes. The operator also operates a fleet of 150 forklift trucks (electric), one of which is gas-powered (butane). These forklifts are driven by a team of 50 forklift drivers.

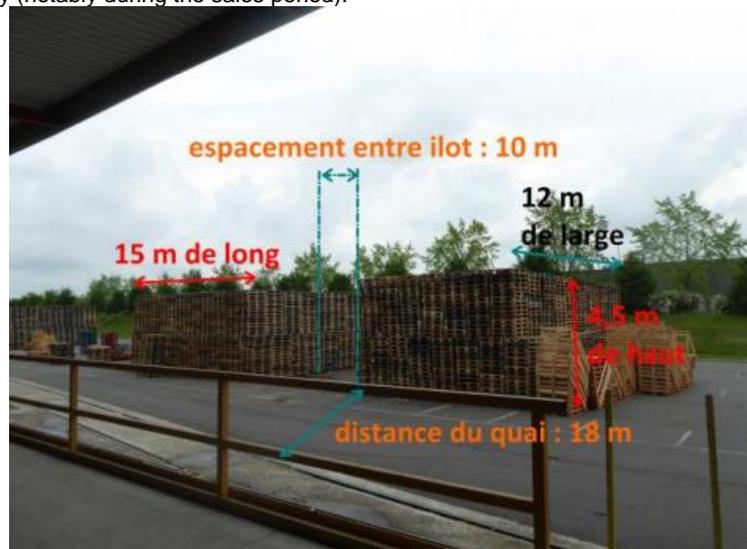
The activities developed in the warehouse's 9 storage bays are logistics activities:

- receipt of goods;
- storage, handling, reconditioning as required;
- order preparation and shipping.

The site is also entirely fenced and guarded. A video surveillance and driver tracking system completes the system.

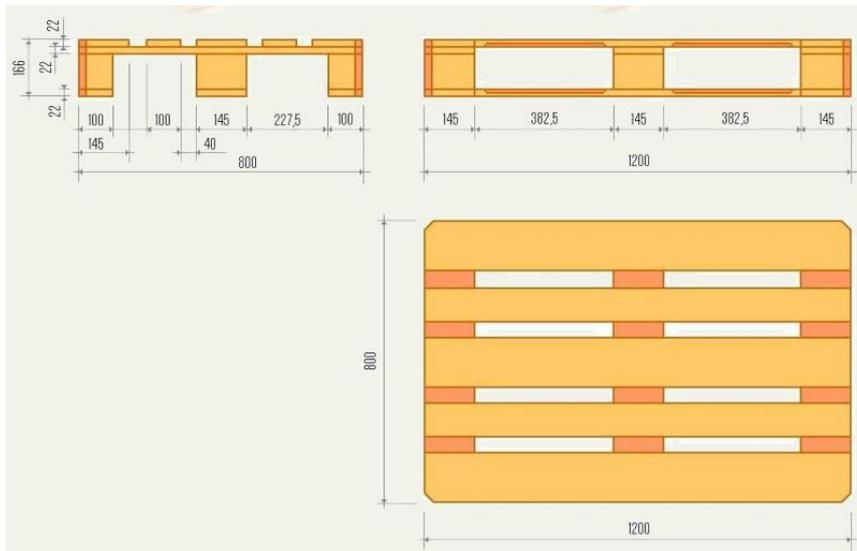
Pallet storage:

The operator stores a maximum of 20,000 wooden pallets at the rear of its warehouse (covered platform on façade) in the form of blocks. The daily flow of pallets leaving the warehouse is estimated at between 3,000 and 6,000 depending on the period of activity (notably during the sales period):



Storage of "Europe-Epal" pallets in the form of blocks (© BARPI)

The dimensions of the stored pallets:



Source: rights reserved

THE ACCIDENT, ITS CHRONOLOGY, EFFECTS AND CONSEQUENCES

Chronology:

9:30 a.m.: a forklift driver used an electric forklift to push and position a stack of 15 pallets into a storage block.

10:00 a.m.: wisps of smoke appeared:



Photo captured by the facility operator's video surveillance system

10:12 a.m.: an outbreak of fire was noted:



Photo captured by the facility operator's video surveillance system
At peak intensity, the flames rose to a height of approximately 11-12 m.

10:15 a.m.: the site manager was alerted and visual confirmation of the fire was established;
 10:20 a.m.: the employee evacuation alarm was triggered (152 persons evacuated the building);
 10:21 a.m.: the fire brigade was alerted and company personnel began putting out the fire with 2 fire hose reels (12 bar);
 10:38 a.m.: the fire had already been brought under control when the fire brigade arrived at the site;
 11:00 a.m.: activity was resumed following verification by the fire brigade commandant.

The consequences:

Estimation of the economic consequences of the event:

- 1,000 euros of property damage (152 pallets destroyed);
- 4,500 euros of operating losses (evacuation of the personnel for 40 minutes).

An estimated 50 m³ of water was used to extinguish the fire. The facility operator noted no damage to the environment, only a small amount of wood debris was noted on the ground. The water retained was released into the stormwater network after passing through a hydrocarbon separator.



Remnants of pallets after the fire awaiting processing in a specialised treatment facility on 22/05/2018 (© BARPI)

European scale of industrial accidents:

By applying the rating rules applicable to the 18 parameters of the scale officially adopted in February 1994 by the Member States' Competent Authority Committee for implementing the "SEVESO" Directive for hazardous substances and in light of available information, this accident can be characterised by the following four indices:

Dangerous materials released		<input type="checkbox"/>					
Human and social consequences		<input type="checkbox"/>					
Environmental consequences		<input type="checkbox"/>					
Economic consequences		<input type="checkbox"/>					

The parameters associated with these indices and their rating scale are available at the website: <http://www.aria.developpement-durable.gouv.fr>.

THE ORIGIN, CAUSES AND CIRCUMSTANCES SURROUNDING THIS ACCIDENT

Two assumptions or disruptions (root causes) were considered to explain the accident:

- malicious intent: a site located near the warehouse was the victim of an arson attack;
- human error when handling pallets, especially when the forklift operator was pushing them.

The first assumption seems unlikely after viewing the video surveillance tapes and considering the activity around the storage blocks. In addition, no rags or cigarette butts were found. The gendarmerie also visited the site but did not follow up on this assumption.

The facility operator thus blames human error for the accident. A forklift driver had used a forklift to transport a stack of 15 pallets while pushing a second stack. A pallet in the second stack was pushed along the ground over a distance of 150 m, most likely causing a nail to heat up (metal-ground contact) which ignited a smouldering fire in the pallet storage area. The fire would have been smouldering for 40 minutes in the storage zone after the forklift driver had placed the pallets in the empty area:



Location of the outbreak of the fire (© BARPI)



Nail in a standard pallet (© BARPI)



Nail protruding from a burnt pallet (© BARPI)

Pushing pallets with a forklift is not authorised. Instructions are given in this regard when passing the CACES (Certificate of Aptitude for Safe Driving). The driver involved in the event is also an experienced driver (17 years experience) and has the CACES 1-3-5 certificate. He also had a forklift permit, issued by his employer, and was up to date with his CACES training. Two specialised trainers/evaluators are present at the facility. At the site, the forklift operators are not paid by the number of tasks accomplished and are covered by the collective agreement for the logistics and supermarkets and supermarkets sector.

As far as the organisational aspects are concerned, there are no written instructions on good practices to be followed. However, upon arrival, the forklift drivers benefit from a day of training during which they are given site-specific oral instructions.

A closer look at CACES (Certificate of Aptitude for Safe Driving):

			
CACES 1 Transpalettes à conducteur porté et préparateurs de commandes au sol ≤ 1 m	CACES 2 Chariots tracteurs et à plateau porteur de capacité inférieure à 6000 kg	CACES 3 Chariots élévateurs en porte-à-faux de capacité inférieure ou égale à 6000 kg	CACES 5 Chariots élévateurs à mât rétractable

ACTIONS TAKEN

Administrative proceedings:

Following the event, the Classified Facilities Inspection authorities conducted an on-site inspection and noted several regulatory non-conformities. In particular, it requests that the operator rectify its situation with regard to sections 1530, 1532, 2662, 2663 and 2925 (presence of a loading room within a storage bay) by means of a prefectural formal notice order.

Actions taken by the facility operator regarding the event:

A feedback report was prepared. The following is a list of the areas for improvement evoked, in particular:

- A review of the company's internal contingency plan (POI), taking into account the need to disconnect the utility networks (gas and electricity). The burning block had been located not far from a natural gas shut-off valve which may have been difficult to operate owing to the heat generated.



Presence of natural gas system shut-off components not far from the burnt block (© BARPI)

- Consideration of ways to control the 13 valves to be operated in order to place the site in a retention configuration. On the day of the accident, only the valves in bays 1 to 4 were closed. Furthermore, only 3 people were trained and authorised to close these valves, which could lead to a situation that is difficult to manage in the event of a widespread warehouse fire or a lack of personnel;
- Oral training of the site's forklift operators to take into account the feedback from the event. No formal written report was compiled to avoid alienating the forklift driver involved in the event;
- Raising awareness among all employees regarding the instructions to be followed in the event of a fire (counting of evacuees, an indication of evacuation end times, etc.);
- Improved communication in the event of an accident: the Classified Facilities Inspection authorities had not been notified in this case. In addition, given the risk posed by the opacity of the smoke on the nearby motorway and air traffic, the managers of these infrastructures must also be informed.

LESSONS LEARNT

Rapid access to 2 fire hoses allowed the personnel on site to quickly contain the fire before it could spread. This demonstrates the value of training the personnel in how to operate the fire extinguishers and fire hoses. However, the need to shut off utilities: electricity and gas, must not be forgotten (fire near the natural gas pipeline).

In order to protect against the risk of fire spreading to all pallet storage areas, the distance between them must also be ensured. In this case, the fire front, evaluated at 11-12 m, was comparable to the distance between each pallet block.

Finally, regarding the handling of goods, it should be pointed out that, according to the "official occupational prevention, health and safety" journal, numerous deadly or significant accidents occur every year. On average, the operators of self-propelled forklifts rack up 8,000 lost-time accidents per year with approximately ten or so fatalities. The risks induced by the handling goods must, therefore, be analysed upstream in order to avoid any adverse consequences in terms of both environmental and human safety. Poor handling practices, even if they would appear to save time, should be avoided.



Handling a stack of 15 pallets with a forklift (© BARPI)