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DETONATION IN A BURNING AREA WITH EMULSIONS CARTRIDGES

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Summary



- Context
- Investigation
- What happened ?
- How to prevent it ?
- Which key learning ?

Context



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EPC France factory is located in the town of Saint Martin de Crau, in south of France.

We manufacture 18 000 T/year of civil explosives :

- Bulk emulsion
- Emulsion cartridges
- Anfo

The accident occurred in a burning area.

Monday, April 4th 2011 at 6:00 am



Context



- 8h38 am, starting the initiation of normal burning operation.
After 12 mn !
- 8:50 am, a strong detonation felt on the plant and around. Enormous smoke coming from the western part of the plant.
- 8:52 am, With his radio, the operator in charge of the burning announced an explosion on the burning area.
- Nobody injured,
- Some small projections around the burning area
- the wall around the burning area was partially fell down,
- Manufacturing immediately stopped and all the personal gathered at the meeting point (POI)

Context

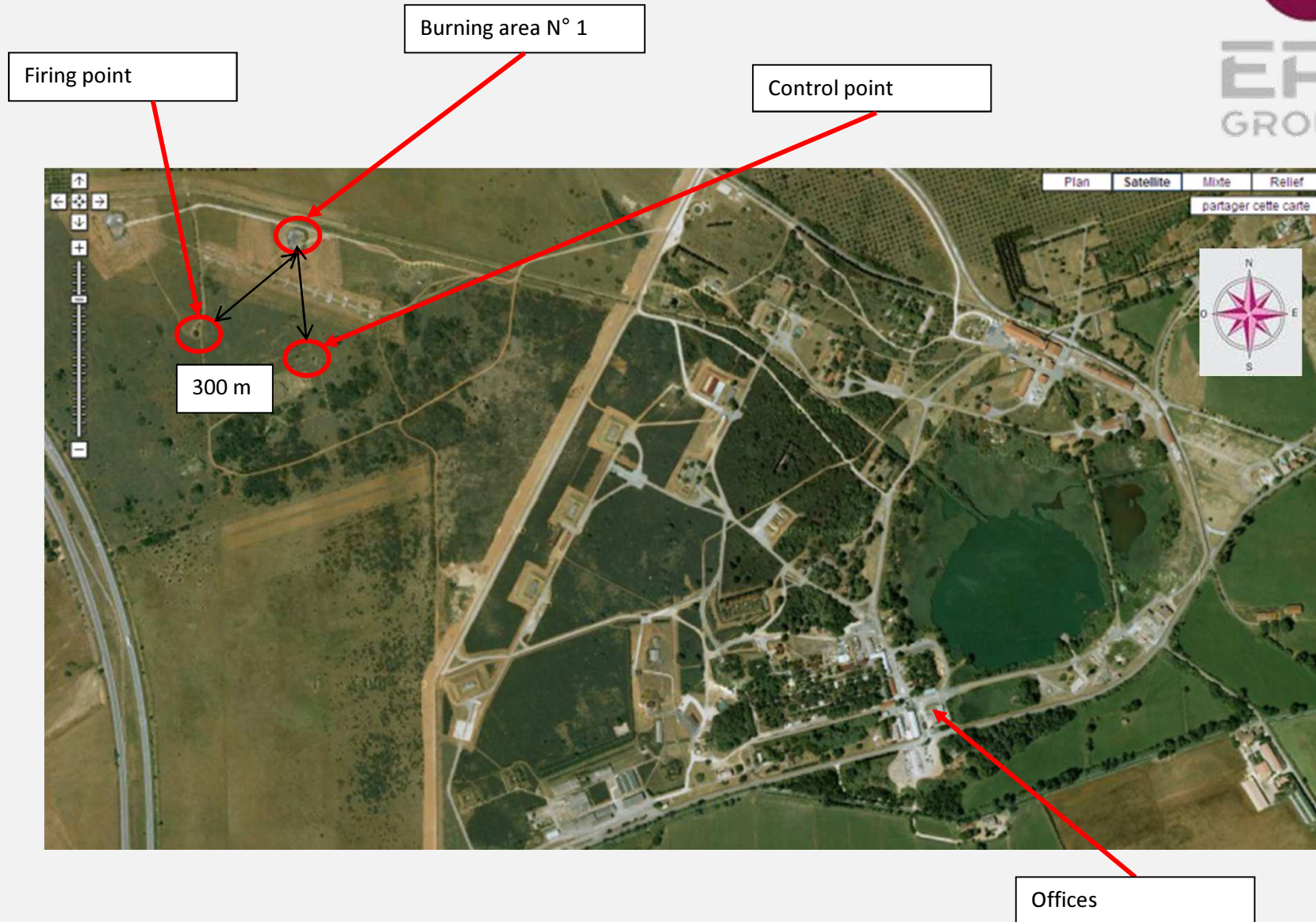


- 9:00 am Local management informed the authorities and Cell Crisis Management. Emergency Plan was active.
- 9:30 am, situation on the plant fully controlled.
- The personnel was calm.
- A visit to the neighbors was organized in order to check if they had any damage.
- A consultation with the doctor was immediately organized on the plant for the most shocked people.
- A stop of work was recommended for 3 plant workers included the burning operator.

Context



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Context



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**The wall partially fell
down**

**No information about
detonation**



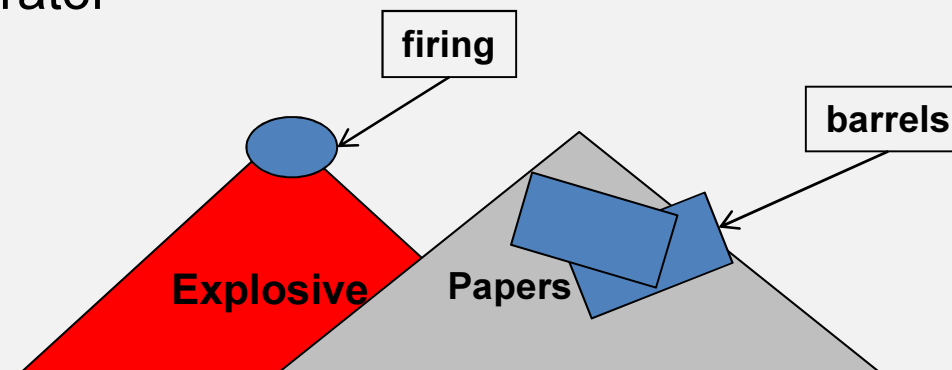
Context

The Stack of waste contain :

- 250 kg pyrotechnical waste of production = maximum quantity allowed
- 150 kg rags and packing soiled by explosive
- 2 empty barrels having contained surfactant
- 12 bags containing paper

And

- 1 pyrotechnical initiator
- 1 Burning operator



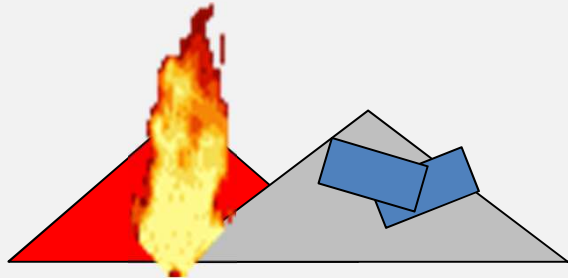
2 influents factors :

1. Confinement due to the quantity of waste and the height of the pile
2. The mix of waste. The fire is not under control because the composition waste is different from day to day.

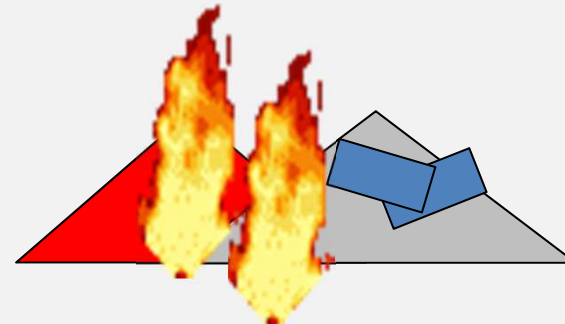
What happened ?



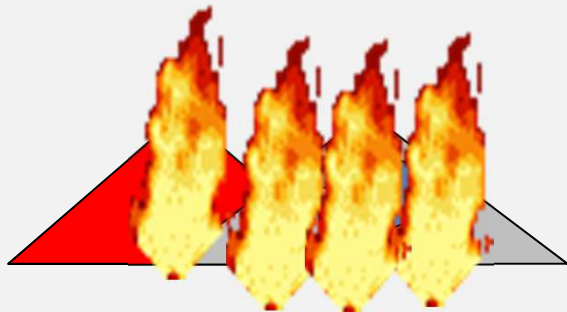
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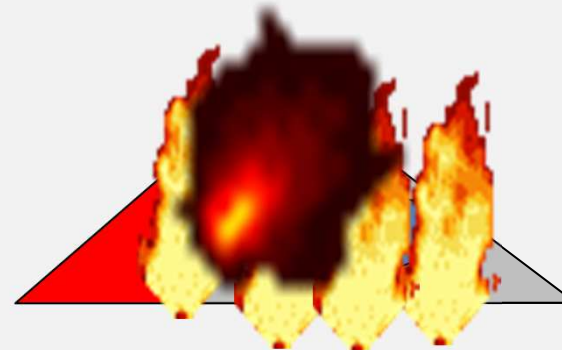
1- Initiation



2 – Progress of the fire towards rags and papers



3 – The temperature increases and the combustion gases are trapped



4 – The combustion is transformed into explosion

How to prevent it ?



- Reduce the quantity of pyrotechnical waste.
- The material would be lying on the ground to reduce risk of confinement.
- Separate pyrotechnical waste and non pyrotechnical waste during the burning operation.

Which key learning ?



- Emulsion is an explosive (20 years without burning incident) !
- The human impact of this accident has been reduced by 2 measures :
 - Distance 300 meters between the operator and the burning area.
 - Protection of the operator by a shelter.
- Efficient of emergency plan due to :
 - Crisis management plan established
 - Regular exercises for tested emergency plan



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Thank you