SAFEX congress in Istanbul

Incident involving a Chub machine

Laurent Casagrande and Thierry Rousse

SUMMARY of the PRESENTATION

- Introduction of EPC Groupe
- Chub incident : What happens ?
- Chub incident: Why did it happen ?
- Chub incident : How to prevent it ?
- Chub incident: Which key learning ?

EPC Groupe

- EPC was formed in 1893

- Turnover is about 300 million Euro
  - 60% Blasting Related
  - 29% Demolition & Recycling
  - 11% Other Activities
    - Chemicals etc.

- Operating in 22 countries
  - Europe, Middle East & Africa

Eugène Jean Barbier
Founder of EPC

EPC Groupe

- More than 100 years of Explosives Manufacture

- Developed own technology for
  - Dynamite
  - ANFO
    - EPC held the first worldwide patent
  - Packaged Watergels
  - Packaged Emulsions
  - Bulk Emulsions

Nitroglycerine
Production in 1900

EPC Groupe

- Blasting Related Activities
  - Explosive Manufacture and Supply
  - Detonator Supply
  - Drilling and Blasting
    - EPC operates +120 drill rigs
  - Technical Services
  - About 1300 blasting related employees

EPC Groupe

- Multiblend is the EPC Groupe bulk emulsion system
  - EPC has 20 years experience of the use of bulk emulsions in surface mines and quarries

SUMMARY of the PRESENTATION

- Introduction of EPC Groupe
- Chub incident : What happens ?
- Chub incident: Why did it happen ?
- Chub incident : How to prevent it ?
- Chub incident: Which key learning ?

PRESENTATION

- Location: Factory in South of France
- Facility: Emulsion production line
- Workshop: Emulsion cartridges production
- Time: Tuesday, February 27th 2008 at 13:24.
- Operation in progress: Starting the chub cartridging machine

GENERAL VIEW of CHUB machine

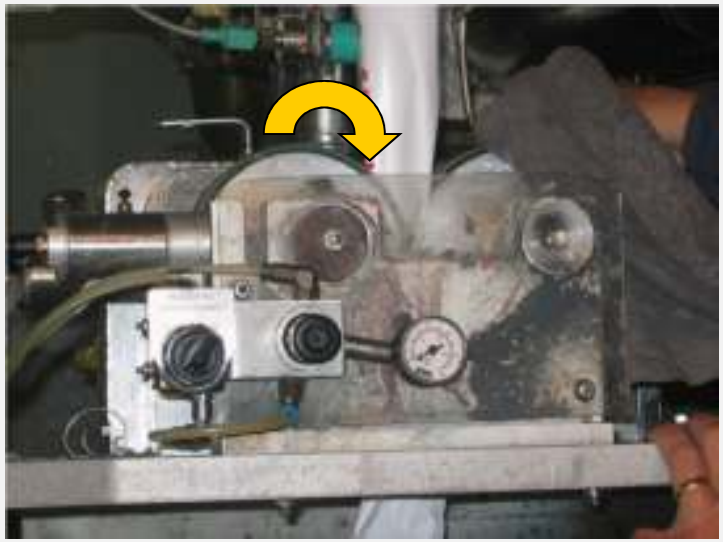
Some PICTURES from VIDEO when LTA happens

Those 6 pictures represent 6 seconds

Some COMMENTS about VIDEO

- The second shift has started at 12:30. The accident occurs at 1:24 pm.
- Significant time before ready to start: ~ 1 hour *(unusual)*
- Some other general comments about :
  - Access to the workplace *(not easy, not designed)*
  - PPE *(2 attitudes which reflects "internal pressure")*
  - 3 persons in the workshop *(unusual)*
  - The 2 wheels running down and in "close " position. *(not felt as dangerous)*
  - A confirmed and good record "chub operator"

SEQUENCE of actions



1.– Equipment has stopped since 12:30 pm because some technical issues on the production line in another workshop.

2.- During starting, plastic film keeps sticking to the metallic pipe.

3.– After taking out the plastic film (which is not the case on the picture) , **the operator cleans with a rag the wheels used for pulling down the film plastic .**

4.– He uses a rag and he runs the wheels for pulling the film plastic down. This makes possible a better cleaning.

5.– The wheels pull down the rag and the operator hand by crushing his thumb.

ABSTRACT

- An operative was preparing to start the chub machine.
- Using a rag, he was cleaning the two wheels that draw the plastic film through the machine.
- The wheels were in motion at the same time.
- So, the cleaning rag and his thumb were trapped and pulled into the nip point between the two wheels.
- The end of the operator thumb was crushed.

SUMMARY of the PRESENTATION

- Introduction of EPC Groupe
- Chub incident : What happens ?
- Chub incident: Why did it happen ?
- Chub incident : How to prevent it ?
- Chub incident: Which key learning ?

ROOT CAUSES

- Lack of protection when wheels in running : Easy to expose his finger to moving parts.
- Loss of hazard representation.
- Poor procedure: A procedure was existing but lack of instructions on how to clean the wheels .
  → Each operator had his own guiles.
- Loss of expertise: Deviations versus the good practises but not reported for a « long » time.
- Ancient machine bought in 1991: Design not leaving enough space in the wheels area. Difficulty to comply with moving parts.

SUMMARY of the PRESENTATION

- Introduction of EPC Groupe
- Chub incident : What happens ?
- Chub incident: Why did it happen ?
- **Chub incident : How to prevent it ?**
- Chub incident: Which key learning ?

HOW to prevent it ?

- Lack of protection when wheels in running : No barrier when wheels pulling down the plastic film.
  - ✓ *Implementation of a physical barrier (best practise coming another site)*
  - ✓ *Presence of a pictogram highlighting the risk of wheels when running.*

HOW to prevent it ?

- Loss of hazard representation: The area of wheels pulling down the plastic film had not been recognised as dangerous area.
  - ✓ *To trainee the team in order to get the same vocabulary for recognizing a hazard, a risk , an unsafe act .*
  - ✓ *To refresh the team on how to recognize the unsafe acts in their working environment.*
  - ✓ *To remind discipline rule « why is it important to respect strict rules when a risk pictogram ,…« .*
  - ✓ *To sensitise new chub employee by presenting this chub Lost Time Accident.*
  - ✓ *To implement a good atmosphere through the team to keep permanently an open discussion on the individual practises concerning the chub machine « no blame culture»*

HOW to prevent it ?

- Poor procedure : A procedure was existing but lack of instructions on how to clean the wheels .→ Each operator had his own guiles.

  - ✓ *To rewrite the procedure by involving the chub operators.*
  - ✓ *To clarify and give precise details on how to clean the wheels at the production starting or at any diameter change.*
  - ✓ *To change the production line organisation by nominating a team leader « chef équipe » with 5 missions:*
    1- *To trainee all employees joining his team.*
    2- *To evaluate the ability of any employee to be certified.*
    3- *To guarentee the procedure is strictly respected and if necessary to get the authority to change the procedure.*
    4- *To report any significant deviations formally to the plant manager.*
    5- *To participate the Lost Time Accident analysis and initiate a task force for improving the prevention.*

HOW to prevent it ?

- Loss of expertise: Deviations versus the good practises but not reported for a « long » time.

  - ✓ *To formalize the training program content for being certified as a chub operator.*
  - ✓ *To train skill trainers dedicated to cascade the training to the operators.*
  - ✓ *The train team leader to control permanently the daily work made by the operators.*

HOW to prevent it ?

- Ancient machine bought in 1991: Design not leaving enough space in the wheels area. Difficulty to comply with moving parts.

  - ✓ *Outsource a technical audit whose the aim is to identify the findings and propose improvements.*

  - ✓ *1991 date issue involves some others technical problems likely to provoke safety problems. (protection for iron wire used for clipping cartridges).*

SUMMARY of the PRESENTATION

- Introduction of EPC Groupe
- Chub incident : What happens ?
- Chub incident: Why did it happen ?
- Chub incident : How to prevent it ?
- Chub incident: Which key learning ?

KEY LEARNING

- Monitoring of production operation:
  - Makes possible to make a better analysis .
  - Usefull to go over the « technical issue ».

- Accident can involve also « confirmed worker and good record worker ».

- Accident occurs when :
  - Hazard representation is poor.
  - Stress

- Parameters like: Behavior, Management , Procedure are crucial for preventing accident.

- Technical approach for preventing accident is insufficient.

KEY LEARNING

PROPOSALS for improving the prevention

- To be sure that the procedure written is pertinent, applicable and applied → measure gap analysis regularly. « ground visit » is always better than « paper »

- To train and check the employee understanding level after training (« multiple choice survey » with a note and appreciation from the team leader, the trainer , the HR manager and the plant manager)

- To react quickly after an accident: technical improvement when possible is important for the team
  - quite simple to identify and to solve
  - Trend to focus on it
  - Promoting the sharing of good practises between sites