



A tradition of Safety, Strength and Service.

Induced Fire on a Chemically Contaminated Truck Trailer

- SAFEX Closed Day Safe Transport Session -

Martin Held

**XVI SAFEX Congress
Madrid, May 28th – 31st**

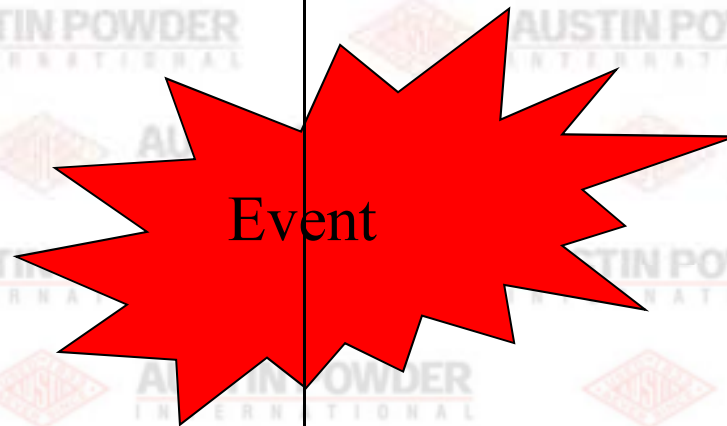
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Time 0



Event

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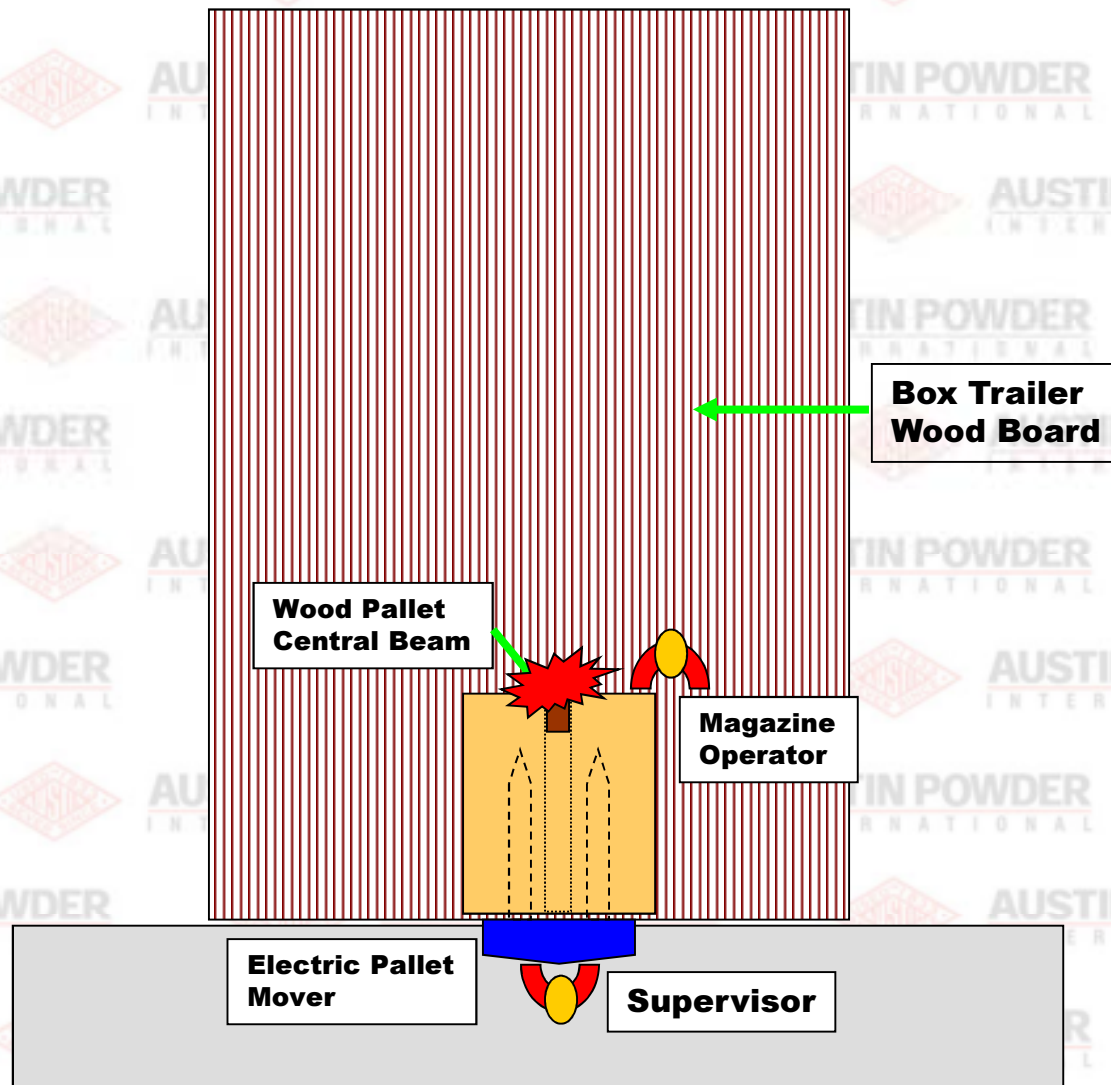
What happened and when?

- **March, 11th 2004 at 2:00 p.m. at Dinamita plant, Durango, Mexico**
- **A flame occurred on the floor of a box trailer being unloaded at magazine 4**
- **A wooden pallet containing 50 boxes of Tovex Primer was unloaded**
- **The flame was observed between the wooden pallet and the trailer floor**
- **The flame was observed as well below the trailer platform**

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Unloading situation at time of incident



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Impacts
Damage
Injuries

Immediate action, damage, injuries

- **Magazine supervisor and operator extinguished fire with extinguishers located outside magazine**
- **Truck driver extinguished fire below platform with truck fire extinguisher**
- **Plant manager was informed**
- **Box trailer and explosives cases were inspected to eliminate further hazards**
- **Damaged wooden board from trailer was removed as well as pallet for further investigation**
- **Rest of box trailer floor was washed and trailer parked outside plant area**
- **General manager and employees were informed**
- **No injuries and further damage than described above**

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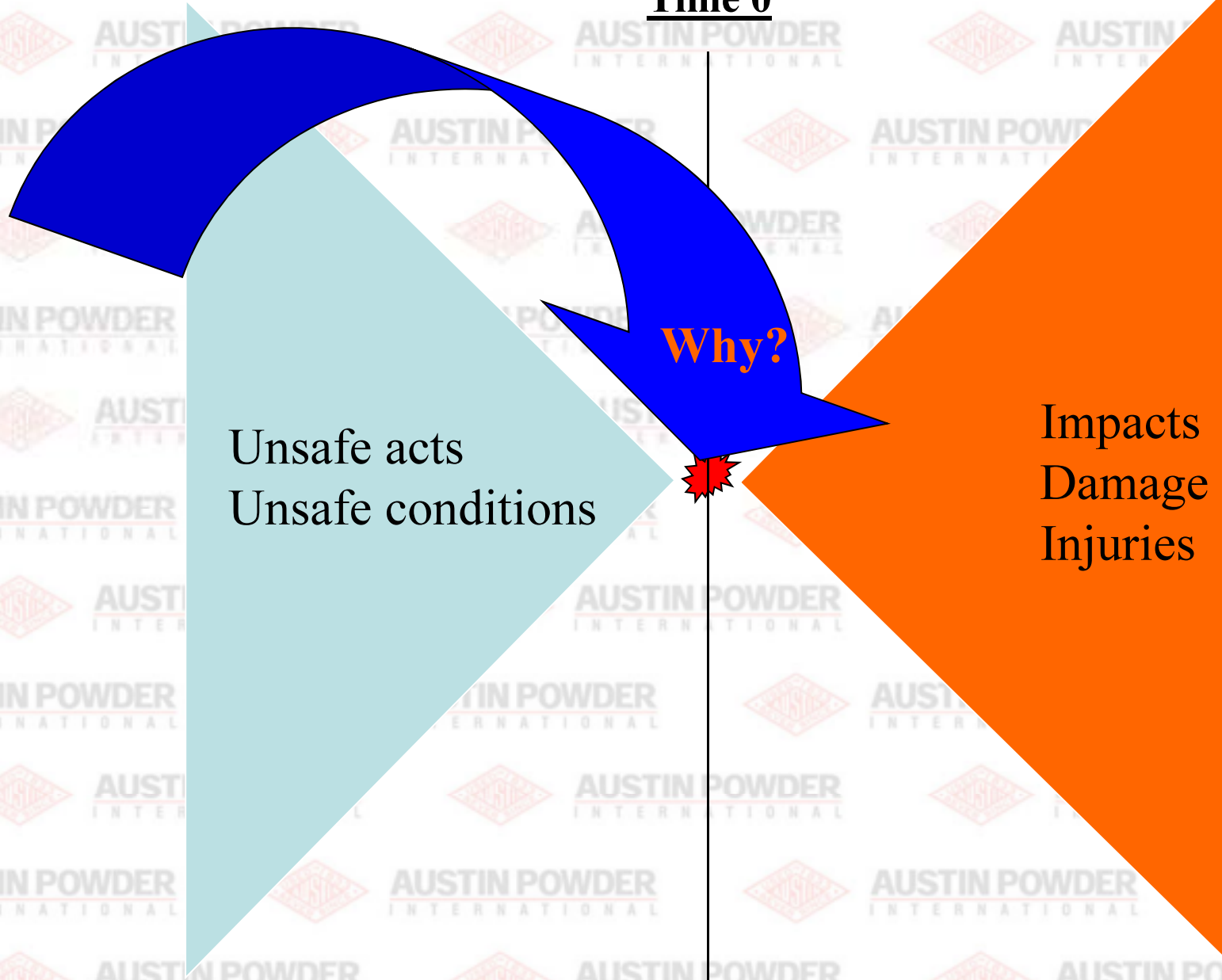
Pre event circumstances

Unsafe acts
Unsafe conditions

Post event effects

Impacts
Damage
Injuries

Time 0



Unsafe acts
Unsafe conditions

Impacts
Damage
Injuries

Why?

Operating procedure

- **Finished product from watergel manufacturing building is transported to the magazine area in wooden pallets containing 50 cases each**
- **Regularly the product is moved in one of two 15 tons trucks owned by Austin Bacis but not this time**

• **WHY ?**

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Particular circumstances/ Unsafe actions

- On March, 11th one of the own trucks was out of order and the other in another service
- Product was transported in a box trailer owned by a carrier who provides transportation services to Austin's costumers
- Box trailer to transport the products Austin Bacis sells must be lined with plywood on the sides and have a wooden floor according to national legislation
- Ceiling of the box trailer was covered with rubber lined sailcloth supported by pipe steel beams along the trailer
- Trailer box was rebuilt in 2001
- Due to construction the trailer was not well accepted for transportation
- Previous to this job the trailer was used to transport emulsion in isocontainers for a competitor
- Pipe steel beams at low level above the trailer floor created difficulties to get the pallets with 50 boxes in
- While loading the trailer the operator removed the upper layer of boxes from the pallets prior to loading



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Particular circumstances/ Unsafe actions cntd.

- Previous to the incident 6 pallets had already been unloaded
- The next pallet was lifted and moved and then lowered and dragged (no removal of boxes like for the loading process)

• WHY ?

- For convenience the upper layer was not removed to pass the steel beam but it was tried to pass it by lowering the pallet as much as possible
- The operator inside took care of the boxes and gave advice not to hit the beam
- The concrete platform at the unloading spot was a bit higher than the trailer platform
- While scratching over the wooden platform a red/orange flame occurred between pallet and platform

• WHY ?

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Particular circumstances/ Unsafe actions cntd.

- **Central beam of the wooden pallet burned partially, it was a 'normal' wood burning giving no hint to contamination**
- **Possible contamination with AN from the water gel plant could not be verified/analyzed**
- **Visual observation of the burned part of the wooden trailer board indicated some kind of contamination**

• **WHY ?**

- **Further investigation with the carrier owner showed that sodium chlorate solution in isocontainers had been transported several months ago**
- **Unloading of the isocontainers was conducted on the platform from the bottom valve with a coupled hose**

• **WHY ?**

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Particular circumstances/ Unsafe actions cntd.

- **Unloading sodium chlorate directly from the trailer by adding water to dilute made the product less sensitive and was common practice**
- **Mexican regulations require stainless steel bottom for trailer transporting sodium chlorate**
- **No one of the carriers allowed to transport sodium chlorate (categorized as an explosive in Mexico) uses stainless steel**

• **WHY ?**

- **Wooden floor is cheaper**
- **Obviously no appropriate control on the system**
- **Chemical analysis showed sodium ions on/in the wood board of the box trailer**
- **Chemical analysis showed no contamination on the wooden pallet**

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Learning points

- **Even simple operations in handling packaged explosives may cause critical situations and near-misses or incidents**
- **Operation of third parties are not under our direct control**
- **Following this transportation (own or by third parties) is a high risk step between manufacturing and use**
- **Small changes in standard operations require a risk assessment**
- **Convenience is always a bad consultant and man becomes careless in 'routine operations' when not properly trained on hazards**
- **Importance of management system tools**
 - **Change management**
 - **Hazard studies**
 - **Risk assessment**
 - **Auditing**
 - **Training**

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How to avoid recurrence? Suggested good practices

- **Review operating instruction for loading/unloading**
- **Review all operations that may have a friction hazard**
- **Review the magazine checklist for controls of trucks prior to load (especially possible contaminations)**
- **Review management of change system**
- **Develop auditing procedures for loading/transportation**
- **Audit all carriers and check what they are transporting**
- **Make a risk assessment if to replace own trailer bottom to rubber liner or similar (avoid contamination by ingress)**
- **Check with authorities all chemical products that require a transport permission and which carrier has permissions for which product**
- **Communicate the incident to other carriers**
- **Inform and train own staff**
- **Provide water extinguishers in addition to powder/foam outside the magazines**

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Questions ?

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