

A Blast from the Past, Braamfontein Explosion, 1896

Boet Coetzee

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Apparently, there is a film, a romantic comedy, with this title. What follows is not romantic nor is it a comedy as you will soon see.



This crater is the result of a significant blast which is the subject of the event we are about to discuss. The crater measured 70 x 50 x 18 m; a biggish room can fit in it. But let's start at the beginning.

SAFEX a multifaceted diamond



In his overview of SAFEX, Piet provided the ideal introduction to what follows. He has shown us that SAFEX has many facets to its operations just as a diamond does. The facet he highlighted was eLearning. The one I would like to talk about is Incident Information

SAFEX Incident Database

- A gold mine of information
- Almost a 1,000 incidents
- Go back a 100 years



The incident information that gets reported to SAFEX is collected in the SAFEX database. It is a gold mine of information about past incidents and readily available for SAFEX Members to access. With almost 1,000 incidents captured in the database, it provides a richness of information that is difficult to equal. The other remarkable fact is that those incidents date back almost 100 years

Question to ponder

Is there much value in historical incidents (say > 20 years ago)



It is this fact which made me wonder if such old or historical incidents are still relevant and valuable today. People may argue that with the changes in technology, explosives formulation and manufacturing methods those lessons may not apply. While such changes cannot be denied, the thing that has not changed is people and specifically human nature. We know how many incidents there are in which the human factor was crucial.

But let's ponder together the question about the value of such old incidents

Is this how you see history?



Some may see old incidents as a waste of time.

Or is it just . . .



Others may consider them to be plain irrelevant.

Remember the lessons of history – if we don't learn from history, we're bound to repeat it.

Ted Cruz

Quotefancy

Perhaps it is worthwhile to pause and think before we rush to judgement. What is said about history may equally apply to old, historical explosives incidents as well. Any explosives professional shudders at the thought of having those incidents recur, I am sure

The Braamfontein Dynamite Disaster, 1896 Let AI Producers give us this historical account of an event that took place in our own backyard AI Producers, "Just Off the Highway", Episode 26, "The Braamfontein Dynamite Disaster, 1896", Oct. 2022 https://www.youtube.com/watch?v=qYB08wi6uqw&t=19s	In 1896 an explosion occurred in the Braamfontein Station. It happened in South Africa, our own backyard so to speak. Let's take this tragedy as the subject of our case study. AI Producers produced a YouTube video series titled "Just Off the Highway". In Episode 26 he discusses this very disaster from an historical perspective. Here is what he has to say: https://www.youtube.com/watch?v=qYB08wi6uqw&t=19s OR elsewhere in the Newsletter																
<table> <tr> <th colspan="2"> SAFEX INTERNATIONAL since 1988 INCIDENT NOTICE (Strictly direct of correspondence to the Secretary General) INCIDENT OUTLINE </th></tr> <tr> <td>When did it happen?</td><td>15:15 on 19 February, 1896</td></tr> <tr> <td>Who experienced it?</td><td>Zuid-Afrikaansche Maatschappij van Ontploffbare Stoffen</td></tr> <tr> <td>Where did it happen?</td><td>Braamfontein Station, Johannesburg</td></tr> <tr> <td>What material was involved?</td><td>60 te of blasting gelignite and some detonators (in separate rail truck)</td></tr> <tr> <td>What happened?</td><td>An explosion occurred when a shunting train collided with 10 rail trucks loaded with explosives.</td></tr> <tr> <td>What was the impact?</td><td>80 to 100 fatalities mostly women and children 200 serious injuries 1,550 to 3,000 homeless Crater 70m long x 50m wide x 8m deep Heard 200 km away</td></tr> <tr> <td>Why did it happen?</td><td></td></tr> </table>	SAFEX INTERNATIONAL since 1988 INCIDENT NOTICE (Strictly direct of correspondence to the Secretary General) INCIDENT OUTLINE		When did it happen?	15:15 on 19 February, 1896	Who experienced it?	Zuid-Afrikaansche Maatschappij van Ontploffbare Stoffen	Where did it happen?	Braamfontein Station, Johannesburg	What material was involved?	60 te of blasting gelignite and some detonators (in separate rail truck)	What happened?	An explosion occurred when a shunting train collided with 10 rail trucks loaded with explosives.	What was the impact?	80 to 100 fatalities mostly women and children 200 serious injuries 1,550 to 3,000 homeless Crater 70m long x 50m wide x 8m deep Heard 200 km away	Why did it happen?		If we must summarise what AI said in a SAFEX Incident Notice, it could look like this. The one thing that is missing on this Incident Notice is 'Why did it happen'. We normally answer this question by accessing reliable information about the incident. You will agree media reports just don't cut it. The 'go-to' source is normally the report of a thorough investigation into the incident, the so-called 'Investigation Report'. However, what do you do in the absence of such a report, as in this case.
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Why did it happen? Official Inquiry Proceedings summarised in a recent academic paper by Garth Ahnie G. Ahnie, "The small matter of E3: Dynamite, human folly and the Braamfontein explosion, 19 February, 1896", <i>Historia</i>, 46, 1, May 2003, pp 23-43. http://dx.doi.org/10.17159/2309-8392/2003/v46n1a2	The proceedings of an official inquiry into the incident should give us very reliable information. Such an inquiry will try to access as many witnesses as necessary to enable the inquiry to arrive at a conclusion. A recent academic paper by Garth Ahnie analysed the inquiry proceedings and gives us a sound basis for our case study. What follows is based on Ahnie's analysis of the official inquiry. To make the printed version of the presentation understandable, there may be a repetition of information from the video.																
Why did it happen? A Four Act drama • Act 1: The 3-day Delay • Act 2: The Shunting Incident • Act 3: Additional Matters • Act 4: Lessons for us	What if we look at Ahnie's paper as describing a drama in four acts with the first three Acts based on the proceedings of the Inquiry • Act 1 examines the 3-day delay and why it occurred • What follows in Act 2 is the Shunting Incident • In Act 3 we consider additional matters which were raised and from which we can learn • The final Act extracts the learning points from the incident described in Acts 1 to 3																



Act 1: The 3-Day Delay

The 3-day delay: Context Supply Chain



As with any incident we need to understand the context or background to the incident. In this case it is important to be clear about the different elements of the Supply Chain as it applied to the 3-day delay

The **Dynamite Company** shipped the required explosives using the services of the **Railway Company**

The Railway Company has a department, the **Railway Order Service**, that loads the cases of explosives onto mule wagons and transports them to the magazines. The *Loading Master* is responsible for this activity.

The magazines where the explosives are delivered belonged to the **Selling Agent**, a man called Lippert. His man on the ground at the magazines was called the *Magazine Caretaker*.

The **End User**, the mines, collect their explosives from the Selling Agent

The 3-day delay: Sequence of events

Sunday, 16 February	• 10 rail trucks (8 'open', 2 'closed') arrive from Dynamite Co. • 2,334 x 60lb cases of blasting gelignite (~ 60t) – some detonators too
Monday, 17 February	• 10:00 Loading Master loads and delivers explosives to Selling Agent. • Reports no one at magazines (refuted at the inquiry) • 13:00 Loading Master returns with explosives and re-loads in rail trucks
Tuesday, 18 February	• Railway Co. again requests Order Service to fetch explosives • Order Service demands £3 from Selling Agent for unnecessary trip • Selling Agent refuses to pay resulting in an impasse
Wednesday, 19 February	• Railway Co. breaks deadlock by agreeing to pay £3 • Loading of mule wagons resumes • 14:30 ~ 120 cases loaded and dispatched when shunting commences

Now let's look at the sequence of events leading up to the explosion

Sunday, 16 February.

10 rail trucks (8 open and 2 closed) with 2,334 cases of explosives each weighing 60lb arrived at Braamfontein siding from the Dynamite Company. The explosive in question was Blasting gelatine, a relatively new introduction to the market that was considered to be safer than dynamite. There were some detonators in a separate truck on the train.

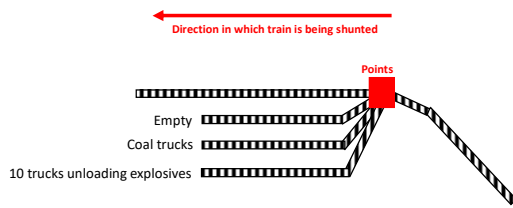
Monday, 17 February.

At 10:00 the Loading Master, sent by the Railway Company, arrives with 5 mule wagons to unload explosives for delivery to the Selling Agent's magazines. When he arrives at the magazines there is no one available to receive the delivery. The Magazine Caretaker refutes this at the Inquiry. The Loading Master waits at the magazines

	At 13:00 Loading Master decides to return to the station to reload the explosives in the rail trucks. He does this without supervision. Tuesday, 18 February. Now the Railway Order Service requires compensation of £3 for the unnecessary trip before making any more deliveries. The Selling Agent, of course, refuses to pay as the Magazine Caretaker maintains he was at the magazines and stayed there until 17:00 the previous day. This resulted in an impasse. In the meantime, as you can imagine, the explosives are ‘sweating’ in the covered trucks because of the summer heat. Wednesday, 19 February. At last, an official from the Railway Company breaks the deadlock when the Railway Company decides to pay the £3. Loading of the mule wagons can now resume. By 14:30, when shunting of the empty rail trucks commences, about 120 cases were loaded and dispatched								
3-Day delay: Issues at the Inquiry <table><tr><td>Railway Order Service</td><td> • Loading Master should have been more patient • Loading Master’s lack of concern when reloading explosives </td></tr><tr><td>The Interface</td><td> • History of animosity • Previous delays and miscommunication </td></tr><tr><td>The Selling Agent</td><td> • They ‘were not beyond lying or manipulation’ • Magazine Caretaker not as diligent as he should have been </td></tr><tr><td>Side Issues (Unrelated to incident)</td><td> • Speeding mule wagons loaded with explosives • Explosives cases handled roughly – new explosives ‘safer’ </td></tr></table>	Railway Order Service	• Loading Master should have been more patient • Loading Master’s lack of concern when reloading explosives	The Interface	• History of animosity • Previous delays and miscommunication	The Selling Agent	• They ‘were not beyond lying or manipulation’ • Magazine Caretaker not as diligent as he should have been	Side Issues (Unrelated to incident)	• Speeding mule wagons loaded with explosives • Explosives cases handled roughly – new explosives ‘safer’	The Inquiry was particularly interested in the following aspects: 1. The actions of the Railway Order Service. • Here the Inquiry suggested that the Loading Master should have been more patient and waited longer at the magazines before returning to reload the explosives in the train. • The Inquiry was also concerned as to whether the Loading Master had gone about reloading the explosives with the proper attention. He did so on his own without supervision. 2. The relationship between the Order Service and Selling Agent came under scrutiny. • At the inquiry it became apparent that there was a history of animosity between the Loading Master and the Magazine Caretaker. It was clear they did not see eye to eye which may have impacted on their actions on the day. • There was also evidence of previous delays and miscommunications between the Railway Co and Selling Agent. This was not the first time something like this may have happened. In how many incidents do we see management failing to pick up and act on early warning signals of possible problems. Is this another example of such a warning signal that was ignored? 3. The behaviour of the Selling Agent • The Inquiry was quite damning of the magazine personnel. It became evident at the Inquiry that ‘their office was not beyond lying or manipulation’.
Railway Order Service	• Loading Master should have been more patient • Loading Master’s lack of concern when reloading explosives								
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	• The Inquiry also suggested that the Magazine Caretaker was not as diligent as he should have been. 4. Side Issues which did not have a direct impact on the incident but did arise at the Inquiry included: • Wagon loads of explosives were seen speeding through the town with only the driver to supervise. On occasion the driver was seen smoking his pipe. Does indicate an attitudinal problem by the people in the Supply Chain? • Apparently, cases of explosives were thrown from the train onto the wagons. When railway and magazine personnel were handling cases of explosives they did not do so with the necessary respect. We don't know whether the perception that this 'new type' of explosive was safer influenced their attitudes and behaviour
 Act 2: The Shunting Incident	
 Shunting Incident: Context Siding layout The curve in the track inhibited the loco driver's view	This is what the siding at Braamfontein looks like now, 100 years after this incident. There are nevertheless similarities to what it looked like at that time. Besides the side rail tracks, what is noteworthy and the thing I want you to notice is the curve in the line. We will see this proved to be a factor in the shunting incident.

Shunting incident: Context Schematic siding layout



To place the Shunting Incident in context we must be aware of the layout of the siding which this diagram tries to illustrate. It highlights some of the important aspects. In this sketch the train would be moving from right to left. Please note the curve in the main line. The train would move through the points which are set manually to move the trucks being shunted onto the desired side track.

At the Braamfontein Station there were 3 side rail tracks next to the main line. They had to accommodate the unloaded or empty trucks waiting to be loaded or loaded trucks waiting to be unloaded.

- The first side track next to the main line was empty. The empty trucks were destined for this track.
- The second track was occupied by coal trucks.
- The third track, closest to the platform, was the one on which the explosives rail trucks were parked and being unloaded.

Shunting Incident: Context



Shunting

Moving rail trucks from the main track to a side track
31 empty trucks had to be shunted by locomotive



Operating Procedure

Manually operate points to direct trucks onto correct siding
Post a lookout on the front truck to warn driver of problems
Locomotive speed limit < 6 kph



Shunting Crew

Foreman shunter oversees the setting of the points.
Two shunters
Locomotive driver
Stoker

Some background on what shunting entails is also relevant:

- **Shunting:** On the day of the incident 31 empty trucks had to be shunted onto the empty siding. Shunting is the task of pushing or pulling a train or part of a train from the main track onto an alternative track using a locomotive.
- **Operating Procedure:** During shunting, the rail trucks were directed onto the correct siding through manually operated points which were normally locked. A lookout had to be posted on the front truck to warn the locomotive driver in case of a problem on the track. It follows that the locomotive driver should always be able to see the lookout. As shown in the layout of the sidings, the rail trucks had to be shunted round a bend to the sidings. The normal speed at which shunting took place was 6 to 10 kph. Actual speed on the day was 3 kph.
- **Shunting Crew:** A Foreman supervised the crew. He would delegate tasks and oversee the setting of the points. He had two Shunters helping him. The Locomotive driver operated the locomotive with the assistance of the Stoker.

Shunting Incident: Sequence of events

Wednesday, 19 February	
14:30	• Shunting commences • Foreman instructs Shunter 1 to set points – lock missing • Labourer cleans points – seen by shunters and loco driver • Shunter 1 instructs Labourer to get on front truck as additional lookout. • Shunter 1 signals Driver to proceed • Shunter 1 climbs on 4th truck from the front • Shunter 1 notices the wrong track; but his signal and shout is not heard • Driver realises on wrong track; instructs Stoker to apply brakes
15:15	• Empty trucks collide with explosives trucks being unloaded

How did the events unfold on Wednesday, 19 February, the day of the explosion.

At 14:30 shunting commenced. At the same time explosives were being unloaded from the train onto the mule wagons. The Foreman shunter instructs one of the shunters to:

- prepare empty trucks for shunting,
- set the points so that the empty trucks can be shunted onto the empty siding
- act as lookout near the front of the trucks .

At the Inquiry both shunters confirmed that the points were set correctly. However, the lock for the points directing the train to the track on which the explosives were being unloaded had been stolen and not replaced. One of the Shunters remembered there was a labourer cleaning the points at the time. This was confirmed by the Locomotive driver who saw the labourer when he was on his way to collect the trucks.

Shunter 1 instructed the labourer to get on the front truck as an additional lookout. He signals for the Locomotive Driver to proceed and cross over to the siding before climbing on the 4th truck from the front. The train passes the points and shunter 1 realises they are on the wrong siding. He signals and shouts to the Locomotive Driver but this is not heard or seen by driver.

When driver realised they were on the wrong track he shouts to the stoker to apply the brakes but momentum carries the train forward. At 15:15 the empty rail trucks collide with stationary explosives trucks followed immediately by the explosion. The Stoker recalled while he was applying the brakes the explosion occurred.

It is worth noting that the whole shunting crew survived the explosion and were able to testify at the Inquiry. However, the Loading Master, who oversaw the unloading, together with the labour working for him, did not survive. The same applies to the Labourer who was posted on the front truck as lookout

Shunting Incident: Issues at the Inquiry

Setting of Points

- Foreman instructed Shunter 1 to check points
- Both Shunters claimed setting was correct when inspected
- Labourer may have changed them while cleaning

Placement of Lookout

- Why did Shunter 1 delegate this to the Labourer
- Shunter 1 should still have noticed points (Foreman)

Side Issues (Unrelated to Incident)

- Locomotive recently serviced
- Brakes were in good condition

As in the case of the 3-day delay, the Inquiry interrogated the following aspects

1. The incorrect setting of the points

- The shunting crew could not say how this might have happened. The Foreman shunter stated that he instructed Shunter 1 to check the points
- Both shunters claimed they were in order when they inspected them half an hour before the explosion.
- The Foreman, Locomotive Driver and Shunter 1 all mentioned the labourer who was cleaning the points before the explosion. The implication is that this labourer changed the points setting while he was cleaning them.

2. Placement of the Lookout:

- Why was Shunter 1 not on the front of the train as instructed by the Foreman. Furthermore, why did Shunter 1 instruct the labourer to be in the front
- The Foreman was adamant that from where Shunter 1 gave the signal to cross over the points, he would have been able to see the points very clearly and should have noticed that they were not in the correct position.

3. Some side issues not directly related to the incident:

- The condition of the locomotive was raised. It was recently serviced and in good condition.

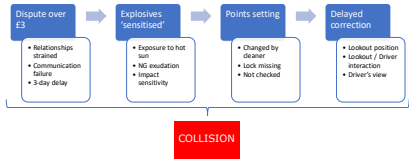
• Focusing on the brakes specifically it transpired these were also in good condition



Act 3: Additional Matters

Official Inquiry Questions • Quality of explosives? • Explosives from same batch of good quality – deteriorate? • Unexploded dynamite after explosion was oozing NG • Explosives reloaded properly after failed delivery? • Detonators on the same train a factor?	There were three general question which the Inquiry wanted clarified: 1. Quality of explosives: • What was the quality of explosives like? A sample from same batch at the factory was analysed and proved to be of good quality. However, it was difficult to tell if the actual explosives did not deteriorate en route coupled with the 3-day exposure to the hot sun in a covered rail truck. • After the blast various explosives articles were found, such as unexploded cartridges, detonators and fuses. One article of dynamite was noted to be oozing NG. 2. Explosives repacking in the train: • When the cases of explosives were repacked after the failed delivery, was it packed correctly and safely? The general routine of packing and handling the explosives was later criticised for being reckless and dangerous. 3. Detonators: • The presence of detonators on the train, although on a separate truck, complicated matters. This was of special concern when reloading occurred. Did the explosives being reloaded land up on the same truck as the detonators.
Official Inquiry Findings • Definitive cause: Could not be established • Explosion occurred when shunting train impacted stationery explosives trucks • Behaviour of Order Service and Selling Agent employees • Conclusion: • Blast occurred through negligence • Censured: Railway and Dynamite Companies	According to the findings of the Commission of inquiry there was no direct cause. The one thing that could not be emphasised enough was that the explosion occurred upon the impact of the collision. Human pettiness and negligence certainly played their part as well and the Commission admits this. However, the investigations did not identify direct culprits. Management of both the Railway Order Service and Selling Agent neglected their responsibilities and their employees acted negligently Through their negligence, be it indirectly, the only culprits were the employees of the railway company and the dynamite company.

Official Inquiry One thing puzzled me • Why did the Inquiry criticise the Dynamite Co.? • Criticism: 'Company was inconsistent in its regulations concerning the delivery and care of its product' • Shortcomings: • Handling of explosives • Supply Chain relationships	What puzzled me was why the Inquiry was so scathing about the Dynamite Company's role. Other than providing the product, they had no direct role in the matter. Here the Inquiry's criticism was interesting, and I quote: 'Company was inconsistent in its regulations concerning the delivery and care of its product'. Clearly this referred to the shortcomings in the handling of explosives and the relationships between the different elements in the Supply Chain. It is akin to a baton being dropped in a relay race. Would the Inquiry have been less critical if a well-prepared Material Safety Data Sheet (MSDS) was in place for the product and used as is our practice today? Today we will call this 'Product Stewardship'
Product Stewardship • Manufacturer must manage the impact of the product throughout its lifecycle • So-called 'cradle to grave' responsibility	Product Stewardship is the responsibility a manufacturer assumes for managing the impact of the product throughout the lifecycle of the product. We refer to this as a 'cradle to grave' responsibility. It is part of the Responsible Care initiative (https://www.caia.co.za/responsible-care/). This is a voluntary programme which foremost chemical companies throughout the world have adopted. It is a commitment to sustainability in which those companies strive continuously to improve all aspects of health, safety, and environmental performance. Open communication about its activities and achievements is an important part of this initiative. Member-companies strive to 'do the right thing, even when no one is looking.' In case you think this does not apply to you if your company has not signed up for this initiative, you better think again. I have no doubt this is the standard to which all of us will be held. As we saw: if people believed that a 100 years ago, surely it will apply even more so now

 Official Inquiry The Paper concluded • The Commission's conclusions do not detract from the matter of the £3 and the delay it caused, as the trigger • The railway points set incorrectly led to the collision and was ultimately the final nail in the coffin	What was the conclusion Ahnie drew in his Paper? 1. Whatever the reasons for the Commission of Inquiry's conclusions, they do not take away from the fact that the matter of the £3 and the delay this caused, was the first step, the trigger for the accident and the chain of events which led to the explosion. 2. The railway points that were set incorrectly led to the collision (which occurred during the offloading of the explosives) and was ultimately the final nail in the coffin
 Act 4: What can we learn?	
Assume: Probable Scenario Explosives in stationary trucks were sensitized by prolonged exposure to heat and detonated on impact of shunting train  <pre> graph LR A[Dispute over £3 • Relationships strained • Communication failure • 3-day delay] --> B[Explosives 'sensitized' • Exposure to hot sun • NG exudation • Impact sensitivity] B --> C[Points setting • Changed by do-aler • Lock missing • Not checked] C --> D[Delayed correction • Loadset position • Loadset / Driver interaction • Driver's view] A --> E[COLLISION] B --> E C --> E D --> E </pre>	Based on the information we have been able to glean from the Inquiry as captured in Ahnie's Paper, we can develop a hypothesis, a theory, about what happened. If there was 'free' NG present in trucks as indicated by exudation found in unexploded cartridges, the following may explain the incident: Explosives in stationary trucks were 'sensitized' by prolonged exposure to heat and detonated on impact of shunting train. How did this arise: • Pettiness and strained relationship between the individuals involved resulted in a communication failure between the Order Service and Selling Agent, This gave rise to a dispute over the £3 which took 3 days to resolve and a consequent delay in off-loading the rail trucks. • The prolonged exposure to heat in enclosed rail trucks promoted NG exudation. Free NG is extremely sensitive to impact which resulted in the explosive consignment being 'sensitised'. • The rail points were being cleaned by a labourer who inadvertently changed the setting of the points because the lock, which should have locked the points in place, was missing. Furthermore, the setting was not checked by supervision prior to the commencement of the shunting operation.

SAFEX
INTERNATIONAL
INCIDENT NOTICE
(Jointly drafted in cooperation with the Competent Authority)

INCIDENT OUTLINE	
When did it happen?	15:15 on 19 February, 1896
Who experienced it?	Zuid-Afrikaansche Maatschappij van Ontploffbare Stoffen
Where did it happen?	Braamfontein Station, Johannesburg
What material was involved?	60 te of blasting gelignite and some detonators (in separate rail truck)
What happened?	An explosion occurred when a shunting train collided with 10 rail trucks loaded with explosives.
What was the impact?	80 to 100 fatalities mostly women and children 200 serious injuries 1,550 to 3,000 homeless Crater 70m long x 50m wide x 8m deep Heard 200 km away
Why did it happen? Theory.	3-day exposure to hot sun in enclosed rail trucks may have caused some NG exudation. The impact from the collision of a shunting train with the explosives trucks resulted in a detonation.

Lessons: Relating Past to the Present

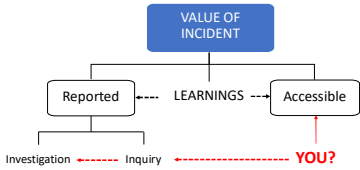
Then	Now
3-Day delay - Relationship: Order Service / Magazines - Handling of explosives - Attitude – ‘this explosive is safe’ Shunting incident - Ineffective lookout - Points unlocked - Supervision lacking	Supply chain shortcomings - Interpersonal relationships - Handling of explosives - New generation explosives is ‘safe’ Risk management - Alarms – location, tested and ignored - Mitigating measures effectiveness - Supervision – discipline enforced

- As the Lookout was positioned on the 4th truck from the front, there was a delay in him noticing the incorrect setting of the points. His attempt to alert the Locomotive Driver failed. In addition, the bend in the track obstructed the Driver’s view so that he also realised too late that they were on the wrong track. Together this resulted in a delay in corrective action followed by the collision with the loaded explosives trucks.

Based on our assumption we can now propose a hypothesis and complete our Incident Notice like this

Given our hypothesis we can summarise the learning points at that time in the lefthand column. Can we relate to them today and what could it mean.

- Supply Chain shortcomings
 - There are still people operating in our Supply Chains today. How are their interpersonal relationships and have we seen evidence of personality clashes and communication failures that could alert us to problems
 - Complacency can so easily set in. Are folk in the Supply Chain handling explosives with the proper respect. Have we provided guidance on the matter. Do our MSDS cover such issues and have we made sufficient training material available?
 - With the emphasis we place on making our new generation explosives and accessories less hazardous, is it giving rise to the wrong attitude that these explosives are ‘safe’?
- Risk management
 - The Lookout is the equivalent of the alarm systems we may have in place to alert us when an unacceptable condition arises. Are the systems correctly located and tested. Furthermore, do our operators react to them timeously.
 - The lock on the points was a mitigating measure to prevent something from being changed or tampered with. Do we have

	appropriate preventative measures in place and are they being maintained and operational. These need to be checked especially after they were subjected to maintenance. • The age-old question of discipline in our explosives operations is once again a factor in this case. Is supervision doing its job and are our operators aware of the reasons for doing something in a specific way so that they can relate to the consequences?
Lessons in a nutshell  Product Stewardship • Supply chain • Handling of explosives • Attitude – 'safe explosives' Risk Management • Alarms • Mitigating measures • Discipline	If we had to summarise those learning points in a nutshell, would you agree it could look like this?
Our original question Is there much value in old incidents (say > 20 years ago) What do you think? 	This is the question with which we started. Having discussed this incident from almost 130 years ago, do you feel that there is still value in such incidents today?
Here is the challenge  <pre>graph TD; A[VALUE OF INCIDENT] --> B[Reported]; A --> C[LEARNINGS]; A --> D[Accessible]; B -.-> C; C -.-> D; B --> E[Investigation]; E -.-> F[Inquiry]; F -.-> G[YOU?];</pre>	But here is a challenge with which I would like to leave you. May I suggest that the value of any incident lies firstly in the learning points associated with it. But it doesn't stop there. If those learnings aren't captured in some kind report and if they are not accessible, they have limited value. If we go back to our mining metaphor of the SAFEX Database. If it isn't possible to mine this information, it will be like undiscovered gold. The nature of the report can vary. We know that the information from a good internal investigation report is invaluable. But what this case has revealed is that the proceedings of an inquiry, will also provide valuable information. In my experience, albeit somewhat dated, the inquiry report, suitably redacted, if necessary, is very much neglected. How much richer would our

	SAFEX Database be if we also included it wherever it is available. But do you notice what is missing. Perhaps it is YOU and ME. Who else will provide such reports if you and I don't do it. We don't have to write those reports. All we must do is to find them and submit them to SAFEX. Is that too much to ask?
 WHAT IF... The information you add to the database prevents harm in future	Such an action of enriching our database of incidents may prevent harm to our people, our facilities, our communities, and our environment. In doing so it also prevents harm to our reputation.
 YOU WILL LEAVE A LASTING LEGACY	What a legacy to leave if a life was saved or an injury prevented as result of something small we did. We may never know. But that is what a legacy is about.