

## **DIRECTORS' AND ENGINEERS' RESPONSIBILITIES FOR SAFETY – A CAUTIONARY TALE**

Brian R. Harris  
Joint Managing Director, Nobels Explosives Co. Ltd.

**IChemE**  
**Safety and Loss Prevention Subject Group Meeting**  
**5<sup>th</sup>December 2002**

**Directors' and Engineers' Responsibilities for Safety**

**A Cautionary Tale**



Brian R Harris 5 December, 2002

## **The Cautionary Tale**

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**Personal experience of the aftermath of a fatal explosion at Cookes Works, Penrhyndeudraeth, Wales**

**14 June 1988**

**Joint Managing Director, Nobels Explosives Co. Ltd.**

### **Background**

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**•Nobels Explosives Co Ltd**

wholly owned subsidiary of ICIplc

**•Products**

Commercial Explosives

Detonators

Propellants

Propellant Devices

**•Headquarters**

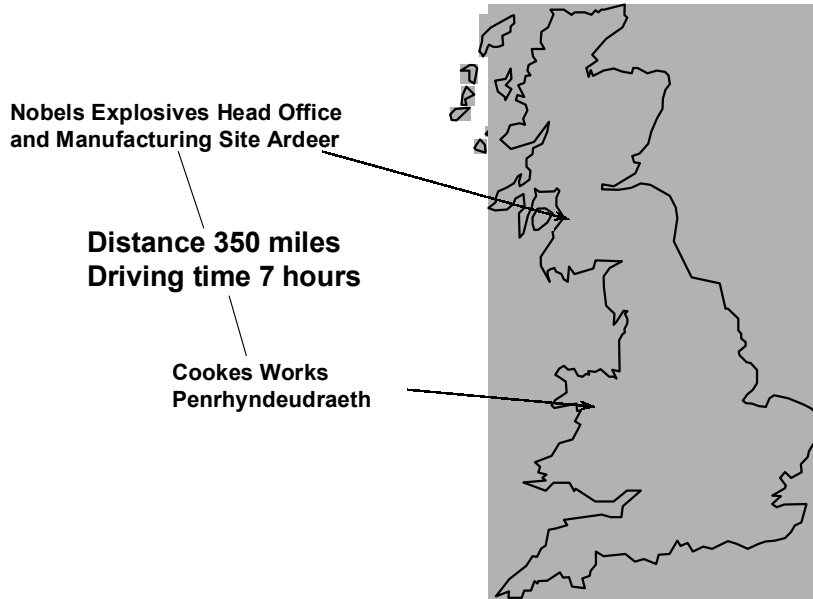
Ardeer, Stevenston, North Ayrshire

**•Manufacturing Sites**

Ardeer	2000 people	
Wigan	250 people	(Roburite Works)
Penrhyndeudraeth	100 people	(Cooke's Works)

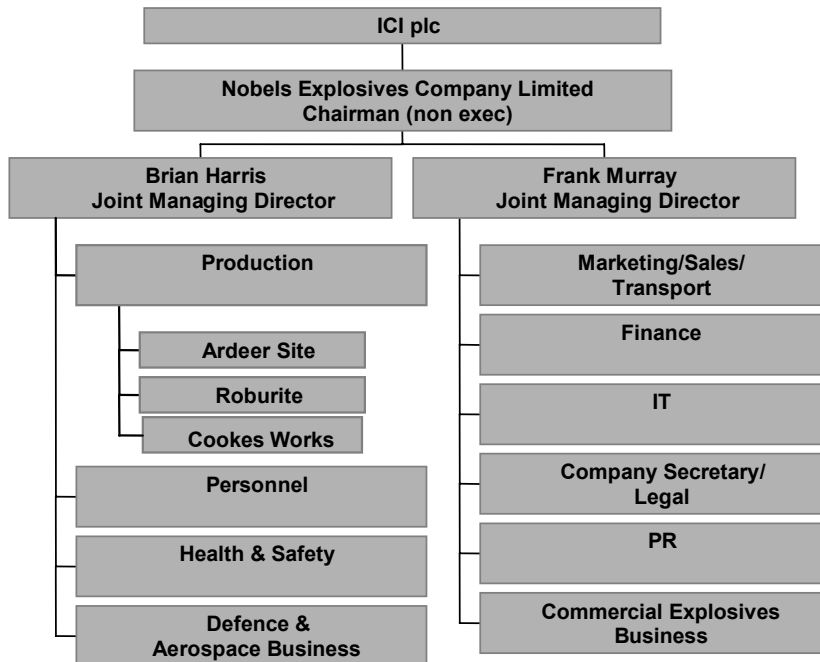
## Geographic Dimensions

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## Organisation

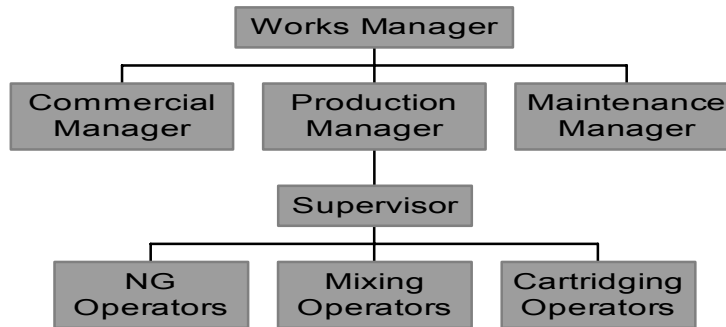
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## Cooke's Works

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- **Manufacturing process**
  - Nitration of glycerine to produce nitro-glycerine
  - Mixing to produce gelignite - a safe paste
  - Cartridging in paper to produce sticks of explosive
- **Flat organisation**



- **A close knit family, Welsh speaking**

## My Background as at 1988

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- **1966 - 1986**  
ICI Petrochemicals
  - design, plant operation and senior management
  - exposure to management of high hazard processes
  - “schooled” by Trevor Kletz
- **1986 - 1987**  
Nobels Explosives Co Ltd  
Production and Personnel Director
- **1988 -**  
Nobels Explosives Co Ltd  
Joint Managing Director

## **Communication and Safety Culture**

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- **Clear ICI Group Health and Safety Policy statement and arrangements**
- **Clear Nobels Explosives Co. Ltd Health and Safety Policy and arrangements**
- **Joint consultation  
Health and Safety committees**
- **Health & Safety first item at meetings Board, Executive, Management and consultation meetings**
- **Speaking to People**
- **Toolbox talks**

## **Communication and Safety Culture**

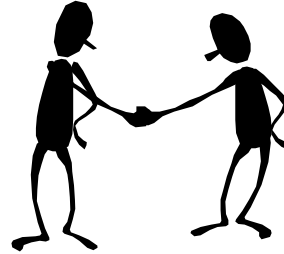
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- **All operations subject to hazard analysis and safety review**
- **Well defined audit programme**
  - **internal / external (ICI)**
  - **action follow up and close out**
  - **visibility and audit trail**
- **Regular review and audit by Explosives Inspectorate**

## Personal Involvement

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- **Personal site visits and audits**
  - quarterly at Cookes Works
- **Close inspection of randomly selected area**
- **Spoke with the plant operatives**
- **Informal discussion with representatives**
- **Priority given to spending to improve safety**
- **Reviewed with Works Manager the outcomes of audits and actions**



## Safety Arrangements Assessment

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- **From what I have said so far how would you judge the management arrangements with regard to safety back in 1988?**



- **Not untypical of a company that is striving to achieve a good safety performance and exercising care.**



### **Personal Memories of 14 June**

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- **It's Good to be Alive**
- **The call you never hope to get**
- **Preparation and travel**
- **An aerial view**
- **Arrival**
- **Assessment**
- **There are no bodies**
- **The families**
- **Press conference**
- **BBC TV interview**
- **9 o'clock news**
- **The world has changed**

## Personal Memories of 14 June

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- **It's Good to be Alive**



**250 Kg of Nitroglycerine  
+  
250 Kg of finished explosive**



- **The world has change**

**15 - 18 June**

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- **The alarm call**
- **The live radio interview**
- **Factory assessment**
- **Visiting the families**
- **HSE/Coroner**
- **Forensic investigation**
- **Making Safe/ Saving the Factory**



## **The Following Week**

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- **Investigation**
- **Plan for recovery**
- **Initial findings**
- **HSE attitude/personal exposure**

## **The 3 P's**

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### **People**

ignorance, attention or intent

### **Plant**

inadequate design or poor maintenance

### **Procedures**

inadequate or poor compliance

**Failure of any one can lead to an unsafe event**

### **The Causes/Evidence**

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- **Causes of the explosion:**
  - Foreign body entering mixer with raw materials
- **Causes of the deaths:**
  - Operators in the wrong place
    - not following procedure
    - not using the reinforced control room/bunker
- **Evidence:**
  - Plant log book was filled in for batches yet to be started
  - Well known that these two operators were regularly in the canteen at times inconsistent with the batch times
  - Clearly not once off behaviour

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### Inspector's Questions

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- How is Nobels Explosives Company organised to implement its safety policy?
- What is the relationship between this Company and your parent Company?
- How does the Board of the Company operate?
- What is your role in the Company and what does it entail?
- What are your qualifications for this role?
- Who appointed you?

### More Inspector's Questions

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- What training have you had for this role particularly with regard to your Health and Safety responsibilities?
- Explain to me your role in safety management in the Company.
- How do you discharge your safety accountability?
- What information do you receive?
- What do you do with it?
- How do you know that the information is valid?

### Yet More Questions

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- How do you know Company procedures are being followed?
- You have told me about audit processes and their findings. How do you know that agreed actions are properly closed out?
- What else would you like me to know?

etc etc etc

- End of (interrogation) interview
- You receive a statement to sign and receive a copy

### Uncertainty

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- Personal introspection
- Other recent disasters
  - Kings Cross fire
  - Herald of Free Enterprise ferry sinking
- The increasing desire to prosecute individuals
- Would I be yet another test case?



- A year goes by!

## Outcome

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- **HSE decides to prosecute the Company**
- **29 March 1990 Mold Crown Court**  
Company prosecuted under section 2 of the Health & Safety at Work Act for failing to ensure the safety of employees by lack of supervision of compliance with operating instructions for the safe mixing of explosives.
- **Company pleaded guilty**
  - fined £100,000 + £30,000 costs
  - account taken of employees' own actions
- **Other costs**
  - personal "costs"
  - diverted management effort
  - commercial impact
  - increased insurance premium

## Learning/Practice

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- **Check that the Health & Safety Policy gives clear direction to the organisation**
- **Understand the scheme of organisation for Health & Safety and ensure it is understood throughout the organisation**
- **Clarify explicitly my accountability for Health & Safety**
- **Get any specific training I need**
- **Identify the information I need to discharge my accountability**

### **Learning/Practice**

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- **Validate the assurance process and identify what I do to assure myself that what is supposed to happen does happen**
- **Know how I can answer the questions I was asked by the HSE**
- **Know how I demonstrate that I have not been negligent**

### **Finally**

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**As a Senior Executive, by knowing how you demonstrate that you are not negligent because of what you do, not only are you assuring your own integrity and that of your company, more importantly you are increasing the probability that people in your organisation will not be injured and will return home each day to their families.**

**Sadly that was not the fate of two men on 14 June, 1988**