

# Hughes Risk Management

## Sample Accident and Incident Investigations



**Case 1 British Gypsum Lopulco Mill Explosion, Kirkby Thore, Cumbria.**



*Internal investigation initiated by British Gypsum to determine cause and remedial risk improvement measures following an explosion of number 1 Lopulco Mill process at British Gypsum Plant at Kirkby Thore in Cumbria. This case investigation covered employee injury as well as plant damage.*

*The scope included the following key elements:*



*Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the human factor elements and injury management*

*Interview processes for personnel and management  
Behavioural programme assessment addressing training, education, competencies and safe work practices  
Design review of process, safety systems and operating parameters*

*Report on findings for company and insurers*

*Preparation for representation for injury claim and legal proceedings*

*The case was settled out of court for personal injury. Key aspects from the investigation report prompted design change to include further safety interlocks and review of behavioural system for training and competency assessment*

## Case 2    *Personal Injury investigation for Wood Group North Sea*



*Investigation initiated by Wood Group North Sea to support their internal Legal department to determine cause and potential liability for an injury sustained by a contracted employee during lifting operations on the Brent Charlie Offshore facility during maintenance and work over operations.*

*The scope included the following key elements:*



*Witness statements and accident report collation. This was further supported by the established lifting work programme and Permit to Work system to establish base case and a causation root cause.*

*Assessment of employment liabilities on contractual review and competency requirements.*

*Overall assessment of the work programme, lighting programme and its controls using bowtie assessment. Key cross reference to the LOLER and PUWER regulations  
Competency assessment and safe work practices.  
Equipment integrity and certification review.*

*Development of overall causation and findings report for internal and legal council use.  
Representation for Wood Group at pre-court discussion with contractors solicitor and preparation of reports for Wood Group council.*

*The injury claim was presented at court and Wood Group found not to have breached any duty of care in its operation or safe system of work. The case was found in favour of Wood Group and not the plaintiff*

### Case 3 Hydrogen Explosion at INCO Refinery Swansea.



*Internal investigation initiated by INCO following an explosion within its nickel extraction process, namely the hydrogen plant. The explosion caused structural damage, downtime and injury to three employees who suffered burns during planned change over and maintenance activities at the refinery.*

*The case was investigated and taken to court for prosecution by the HSE.*

*The scope included the following key elements:*



*Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the human factor elements and injury management.*

*Interview processes for personnel and management  
Behavioural programme assessment addressing training, education, competencies and safe work practices.  
Design review of process, safety systems and operating parameters  
Assessment as top tier COMAH site against Hazard Management controls and safety critical element controls.*

*Report on causation and findings for INCO and the HSE.  
Magistrate Court support and evidence as expert witness.  
Support plan for HSE to agree extension to planned improvement orders based on the report recommendations and timeframe for implementation.*

*INCO were prosecuted at Magistrate Court with a fine based on the fact that a remedial action plan was in place and liability for the injury due to safe working practices failure was agreed.*

### Case 4 Tank Collapse Abu Dhabi United Arab Emirates

Investigation initiated by Abu Dhabi Oil Company (ADNOC) following a collapse of a crude oil tank during the construction phase of the Umm Al Nar Refinery in Mussafa area Abu Dhabi. The main contractor was Six Construct but also there were three other contractors under sub contract arrangements supporting this activity. The accident resulted in two fatalities, several injuries and asset damage. The investigation was conducted under UAE Federal Law with the Abu Dhabi Police.

The scope included the following key elements:



Consultation and scope boundary under Federal Law with ADNOC, Contracted parties and the Abu Dhabi Police to agree reporting boundaries and inputs.

Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the construction activities.  
Sub contract arrangements and combined operation safe systems of work review and management.  
Construction Materials review.

Overall assessment of the work programme, lifting programme and its controls using bowtie assessment.  
Key cross reference to the LOLER, PUWER and UAE Federal HSE regulations.  
Competency assessment and safe work practices.  
Equipment integrity and certification review.

Development of overall causation and findings report for ADNOC, Federal submission and Insurers.

Federal prosecution took place and evidence support given in Court in the UAE.

## Case 5 Employee injury due to rotating equipment accident

Investigation initiated by a canning and conveying company based in the NW of England which resulted in a debilitating injury to an employee. HSE improvement notices were issued as well as personal injury claim against the Company.

The scope included the following key elements:



Witness statements and accident report collation.  
Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the human factor elements and injury management.

System design and guarding/interlock review and assessment of the design contractors Technical File under the CE Marking regulation requirements for safety features.

Detailed causation and findings report to the Client for onward submission to the HSE and Solicitors for Legal Council use.

Remedial design consideration technical report for changes to guarding system  
Company further used the report as possible counter claim for design deficiencies under the CE Marking regulations and relevant codes and practices referenced therein.

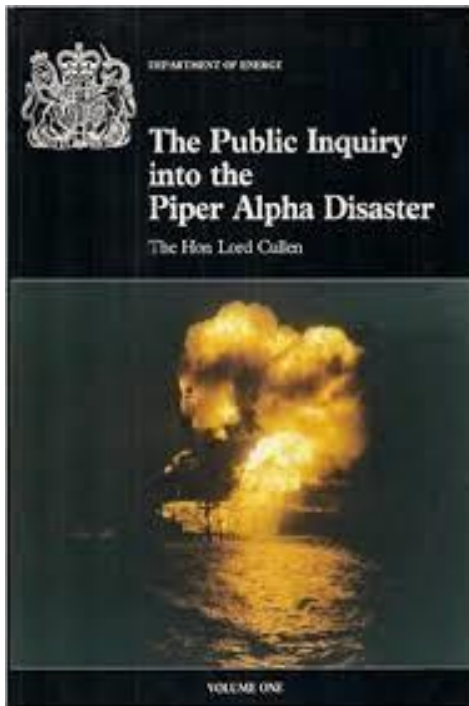
The case was settled out of court for personal injury. Key aspects from the investigation report prompted design change to include further safety interlocks and review of behavioural system for training and competency assessment.



## Case 6 Piper Alpha Investigation

Engaged as part of the investigation team for Cremer and Warner on behalf of the UK Department of Energy. The role was to support the Lord Cullen Technical Panel into the investigation of the events leading to the Piper Alpha fires and explosions with subsequent loss of life and asset

The scope included the following key elements:



Undertaken role of lead investigator for the Piper Alpha module recovery, personnel recovery and with Grampian Police and UK HSE investigation into cause and consequences

Setting up team of investigators to review all aspects of the design, operation and management systems for Occidental Oil Company and the events that occurred on Piper Alpha leading to its destruction and loss of life

- Behavioural assessments
- Survivor interviews
- Technical assessments
- Management interviews
- Systems analysis

Reporting on all aspects of causation and root cause failures

- Human factors reporting
- Contracted parties liability reviews and safe system of work failures
- Documentation retrieval and referencing
- Reports for the technical panel and Council at the inquiry

Reports and attendance to support Council throughout the Inquiry process in Aberdeen

## Case 7 Kings Cross Investigation



*Engaged as part of the investigation team for Cremer and Warner on behalf of the UK Department of Transport. The role was to support the investigation of the events leading to underground system fire at Kings Cross and explosions with subsequent loss of life and asset*

*The scope included the following key elements:*



*Undertaken role of investigator for the review of the fire and smoke generation cases using CFD Modelling techniques to support the causation and consequence modelling leading to the loss of life investigation process*

*Development of reports to assist in the investigation process which included:*

- Human factors*
- Safe system of work failures*
- Design implications*
- Liabilities*
- Consequence modelling and fatality mapping scenarios*
- Adequacy of emergency management*

*Provision of reports for Department of Transport as part of the investigation process for furtherance in the established Inquiry*

*Reports issued and utilised as part of the Inquiry material for Desmond Fennell OBE QC and his panel*



## Case 8 Petrobras P36 (Spirt of Columbus)

*Engaged as part of the investigation team for Poyry Aberdeen to assess the overall loss of production and construction costs for the P36 rig following total loss due to fire and explosion which also incurred 11 fatalities. The review was to establish fair and reasonable reimbursement for the rig (Scott Company) and damage sustained to the Marlim Field facilities.*

*The scope included the following key elements:*



*Review of all claim documentation with regard to construction and build costs for the P36 Specification deviations with regard to the cost and the actual build requirements (no additions).*

*Design difference review from what existed and what was claimed*

*Consider differences between Roncador and South Marlim*

*Familiarisation with claims (in particular, the text of the claim and Scott Schedules 1 and 2) Direct Cost; Actual for Roncador, estimates for South Marlim.*

*Review of claim and supporting material*

*Consideration of reasonableness for procurement costs for Roncador*

*Consideration of the differences for South Marlim*

*Provision of basis for cost estimation*

*Report of the assessment for the Legal Council for Court appearance and Judicial review*

*Overall report produced between the loss and estimated new build costs that had been claimed by the rig owner and constructor against the operator who hired the vessel for the work on South Marlim. Report was issued on behalf of the Operator to support liability and Claim counter action. Further, included assessment of damage caused to the Operators facilities as part of the incident. Fatalities were not reviewed or investigated in this scope.*

## Case 9 Employee injury and Asset damage due to Fire



*Engaged to support an investigation of a fire incident that also resulted in employee injury and loss of assets. The Injury and Loss occurred on a Chemical Facility in Flimby, Workington, Cumbria.*

*The scope included the following key elements:*



*Witness statements and accident report collation  
Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the human factor elements and injury management.*

*System design and guarding/interlock review and assessment of the design  
Detailed causation and findings report to the Client for onward submission to the HSE and Solicitors for Legal Council use.*

*Remedial design consideration technical report for changes.*

*The case was settled out of court for personal injury. Key aspects from the investigation report prompted design change to include further safety interlocks and review of behavioural system for training and competency assessment. No prosecution from the HSE followed.*



## Case 10 Environmental Pollution

*Engaged by Lawson Mardon Packing and Printing to support an investigation into alleged pollution of the SSSI site Salterbeck Burn adjacent to their facilities on the Salterbeck Estate, Workington, Cumbria. A notice of intention to prosecute was issued by the Environmental Agency due to damage to flora, fora and aquatic life (newts).*

*The scope included the following key elements:*



*Review of potential sources that could enter the back area by either the established drain systems, water run off or by intentional actions*  
*Review of products that could potentially cause harm and enter points of access to the burn or by intentional means*  
*Establish environmental impacts spreadsheet linked to the identified pollution source provided by the Environmental Agency*

*Provision of reports for issue to the Department of Environment with regard to assessment and findings*  
*Internal reporting to the Client on findings and improvement measures that could enhance risk reduction*

*The outcome of the assessment was that the source could not be credibly assigned to Lawson Mardon Packing and Printing and the notice to prosecute was revoked on the evidence provided. Improvements in the current system was identified and implemented as part of the reporting process*

## Case 11 Crane Collapse



شركة العين الأهلية للتأمين (ش.م.ع.)  
Al Ain Ahlia Insurance Co. (PSC)

*Engaged by Al Ain Ahlia Insurance Company for an investigation following a collapse of a crane boom during a heavy lift operation at the National Petroleum Construction Company site at Sadiyatt Island in Abu Dhabi. The crane owner was Al Jabeer and the operation was jointly supervised by NPCC rigging personnel and Al Jabeer. The accident resulted in several injuries and asset damage. The investigation was conducted under UAE Federal Law with the Abu Dhabi Police.*

*The scope included the following key elements:*



*Consultation and scope boundary under Federal Law with Contracted parties and the Abu Dhabi Police to agree reporting boundaries and inputs.*

*Review of the causation and root cause factors which included assessment of current work practices, management controls and behavioural system for the construction activities.*

*Rig Plan and rigging study for the heavy load.*

*Construction and lifting materials review.*

*Overall assessment of the work programme, lifting programme and its controls using bowtie assessment. Key cross reference to the LOLER, PUWER and UAE Federal HSE regulations.*

*Competency assessment and safe work practices.*

*Equipment integrity and certification review.*

*Development of overall causation and findings report for Insurers, Federal submission and Insurers.*

*The output was no prosecution by the Police*

*Failings from the management of work and the competency of personnel was highlighted in the overall lifting operation, safe systems of work and correct selection of lifting materials*

*Remedial action plan provided as part of the investigation and report to insurers on damage, cost of repair, causation and liability*

## Case 12 Pipeline Loss



شركة العين الأهلية للتأمين (ش.م.ع.)  
Al Ain Ahlia Insurance Co. (PSC)

*Ahlia Insurance Company to assess possible loss of significant GRP pipeline construction and materials site due to flash flooding in the Al Ain desert, Abu Dhabi UAE. The assessment was to determine the credibility of the main contractor Tannorri Engineering claim for £3 million loss of pipeline, construction/trenchworks and material due to the incident.*

*The scope included the following key elements:*



*Review of the potential loss report issued to insurers and development of an assessment programme to look at the construction activities undertaken and materials Development of site visit and mapping/excavation programme to assess loss areas and material movement due to the flash flooding.*

*Site visit and assessment of damage/loss.  
Review of bills of material, work schedules and verification sign off sheets for jointing and pipelay excavations.  
General assessment of work programme and progress versus material and bill of quantities.*

*Report to Insurers for the loss adjustment based on findings from the site assessment and documentation reviews/interview process.*

*Following the review and assessment process a settlement figure was determined by Insurers and Underwriters at £750,000 as full and final for the loss.*

## Case 13 Personnel Injury



Engaged by Corker Binning on behalf of C.RO Ports to undertake an independent accident investigation following personnel injury at the Killingholme Port Facility, Humberside, UK.

The scope included the following key elements:



Site visit, interviews of those involved in the incident, documentation review and a report on the process and findings, which included:

- a. The facts, causes and outcomes of the incident
- b. Contributory factors
- c. Risk minimisation
- d. Recommendations for prevention of other potential occurrences
- e. Possible HSE Breaches

The investigation utilised BowTie Incident XP software to establish time lines and potential HSE Critical barrier/control failures Development of a full accident investigation report  
Development of HSE Observations report from the site visit of non-incident related findings and recommendations for C.RO consideration.

Report issued for internal furtherance and to support UK Health and Safety Executive requests of CRO Ports

## Case 14 Personnel Injury

*Engaged to undertake an independent investigation to review safe work practices and equipment integrity for an incident resulting in injury and asset damage during Lifting, pipelay and tie back operations as part of Offshore EPIC programme for offshore floating facilities operations*

*The scope included the following key elements:*



*Review of documentation which included:*

- a. Permit to work system*
- b. Lifting plan and LOLER assessment*
- c. Scope of work*
- d. Lifting equipment integrity, competencies and certification*

*Investigation reporting on:*

- a. The facts, causes and outcomes of the incident*
- b. Contributory factors*
- c. Risk minimisation*
- d. Recommendations for prevention of other potential occurrences*
- e. Possible HSE Breaches*

*Report issued for internal furtherance and to support the RIDDOR investigation inputs for the UK Health and Safety Executive.*

Further cases undertaken include:

- *Personal injury due to fuel tanker loading failure*
- *Loss of assets due to fire and subsequent gas explosion of printing works in the UAE*
- *Injury and loss of asset due to fuel transfer operations in solvent recovery installation*
- *Personal injury investigation for joinery and wood storage facilities*
- *Various Loss investigations on behalf of Insurers and Underwriters*
- *Estimated and Probable loss risk assessments on behalf of Underwriters in Africa, Middle and Far East*



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