TR3 CONSULTING LTD

MARTYN J A LYONS

TSA

Tank Storage Association

Managing Contractors

Martyn Lyons

1st November 2021

Martyn Lyons, Managing Director, TR3 Consulting Ltd.

- CEO of Inter Terminals Jan 2015 – Dec 2020
- 33 years experience in the Tank Storage sector
- Fulfilled many different roles including Operations Manager, Terminal Manager, Operations Director, Managing Director and pan European CEO
- Independent Director and former Chair of the Tank Storage Association (TSA)
- Former member of the Buncefield Standards Task Group and Process Safety Leadership Group
- Member of the International Institute of Risk & Safety Management (IIRSM)
- Professional Marine and Mechanical Engineer and Member of the Institute of Marine Engineering, Science & Technology (IMarEST)

Why management of contractors is so important.

- Contractors and the important work they do are used increasingly on many sites to carry out tasks where insufficient in-Company resource is available or where Businesses are seeking to streamline
- Examples of increasing contractor involvement are site remediation, asset integrity inspections, engineering modifications and specialist technical input
- Contractors are often asked to do many of the most dangerous jobs. A lot of the work that contractors do is hazardous, both to themselves and to everyone else on site
- Many contractors do not have a detailed knowledge of the sites they work on and the respective hazards and risks
- Companies and their employees all have a part to play to make sure that contractor work is well planned, monitored and controlled, so it doesn't result in incidents.

Who or what is a contractor?

- Anyone who works on a site who is not a full time or temporary employee.

- One possible grey area: ‘staff contractors’, which are defined as a person retained by the Company who is not a direct employee. May not be subject to all contractor control requirements, provided their role is defined (e.g. job description) and suitable procedures/risk assessments are in place for the work that they do.

Key legal issues relating to contractor safety

- Health and Safety at Work etc Act 1974
- The Management of Health and Safety at Work Regulations 1999 (as amended)
- Construction, Design and Management Regulations
- Control of Major Accident Hazards Regulations 2015 (COMAH, UK implementation of Seveso III)

Key legal issues relating to contractor safety

- **Health and Safety at Work etc Act 1974**
  - The basis of safety legislation in the UK
  - Applies to all work activities
  - Requires all **employers** to ensure, so far as is reasonably practicable, the health and safety of:
    - Their employees
    - Other people at work on their sites (including contractors)
    - Members of the public who may be affected by their work
  - Requires all **employees** to take care not to endanger themselves, their colleagues or others affected by their work.

Key legal issues relating to contractor safety

- The Management of Health and Safety at Work Regulations 1999 (as amended)
  - Apply to everyone at work
  - Employers must:
    - Assess risks affecting employees and anyone who might be affected by work (including contractors)
    - Set up emergency procedures
    - Provide training
    - Co-operate with others on health and safety matters, e.g. contractors
    - Provide temporary workers (including contractors) with health and safety information
  - When 2 or more employers share a workplace each employer must:
    - Co-operate with other employers
    - Co-ordinate steps between other employers to ensure compliance with law

Key legal issues relating to contractor safety

- Construction, Design and Management Regulations (CDM)
  - Covers management of health and safety when carrying out construction projects
- Key requirements of CDM
  - Manage risks by:
    - Avoiding risks where possible;
    - Evaluating risks that cannot be avoided; and
    - Putting in place proportionate risk control measures.
  - Appoint the right people at the right time
  - Provide information, instruction, training and supervision
  - Cooperation and communication
  - Consulting and engaging with workers

CDM Dutyholders

- ❑ Clients
- ❑ Designers
- ❑ Principal designers (when multiple contractors are involved)
- ❑ Principal contractors (when multiple contractors are involved)
- ❑ Contractors
- ❑ Workers

Key legal issues relating to contractor safety

- COMAH
  - Main requirement is to take ALL NECESSARY MEASURES to prevent major accidents and limit the consequences of any that do occur
  - This demands high standards!
  - Applying this to contractors/engineering works, we must apply best practices in:
    - Design and construction
    - Control of ignition sources
    - Inspection, testing and maintenance
    - Contractor control
    - Permit to work systems
    - Management of change/plant modification
    - Site security
    - Training
    - Emergency procedures

It would be expected that Companies have suitable systems and procedures for managing contractors eg:

- Selection, Monitoring and Review of Contractors
- Permit to Work
- Guidance on the Construction Design and Management (CDM) Regulations

Selection, Monitoring and Review of Contractors

- Key points – Purpose and Scope
  - The Company recognizes the importance of selecting the right contractor, and their subsequent monitoring and performance review.

Selection, Monitoring and Review of Contractors

- Key points – Procedure has requirements for:
  - Planning the work
  - Selection and approval of contractors
  - Site induction
  - Contractor and contractor supervisor competence
  - Contractor supervision
  - Site access
  - Permit to work
  - Active monitoring of contractors
  - Contractor performance review

Requirements for Permit to Work (PTW) Procedures

- Key points – Purpose, Objectives and Scope
  - Sets minimum requirements for PTW systems and procedures
  - PTW is a crucial part of the Company's Safety Management System
  - Issue of a PTW is NOT simple permission to carry out a job. It is an essential part of the control system to:
    - Identify hazards
    - Stipulate how the associated risks shall be managed
    - Communicate the hazards and precautions to those doing the job
  - PTW itself does not make the job safe. This is only achieved by:
    - The people planning the work;
    - The people preparing and checking the workstation;
    - The people who monitor and supervise the work; and
    - The people doing the work

Requirements for Permit to Work (PTW) Procedures

- Key points – Documents
  - 2 main forms:

Hot PTW

Cold PTW

  - Each form has a tear-off slip to be retained and completed for confined space entry (CSE) work
  - All forms individually numbered
  - 2 copies of each PTW: "A" (for issue to Permit Holder) and "B" (for retention by site personnel)

Hot work

Any work involving actual or potential sources of ignition, e.g:

- Welding
- Grinding
- Using tools that generate sparks
- Using a generator
- Using electrical equipment if not intrinsically safe

Cold work

Work that will not generate a source of ignition, e.g:

- Visual inspections
- Installing insulation
- Meter proving
- Pressure testing

Requirements for Permit to Work (PTW) Procedures

- Key points – Competence Requirements
  - **Permit Initiators and Permit Authorizers** (those controlling the PTW system) require an in-depth understanding of its operation and a level of competence to ensure that the system is effectively controlled.
  - **Shift Supervisors** (or equivalent) and **other site personnel** require a sound awareness of the importance of PTW and a working knowledge of the system.
  - **Permit Holders (e.g. contractors)** must understand the rules of the PTW system and understand the permissions, limitations and conditions of the PTW.

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Initiator (work originator, e.g. engineer responsible for work)
  - Ensure permit holder and workforce are competent and are inducted to site.
  - Ensure workstation has been prepared, through liaison with Operations to ensure:
    - Adequate isolations have been made
    - Handover/handback arrangements are in place
    - Checks are made to ensure that there are no:
      - Combustible materials
      - Leaks or spillages
      - Open manways/ other plant venting
      - Flammable vapours from nearby operations
  - Establish a method/procedure to be followed by those carrying out the work.

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Initiator (work originator, e.g. engineer responsible for work)
  - Raise the PTW, completing form as fully as possible before presenting to authorizer. As a minimum, Initiator should enter:
    - Contractor/person who will be carrying out the work
    - Work to be done
    - Location
    - Equipment to be used
  - Discuss PTW and associated plans/document with the permit authorizer.
  - Do inspections/audits to verify work is being carried out safely and as agreed.
  - Ensure workstation is inspected for completion/progress prior to signing the confirmation section.
  - Continued on next slide…

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Initiator (work originator, e.g. engineer responsible for work)
  - Ensuring that, 30 minutes after hot work stops, workstation and surrounding area are fire-checked (usually by PTW holder).

Requirements for Permit to Work (PTW) Procedures

- **Key points – responsibilities of Permit Authorizer**
  - 2 main aspects to authorizer role:
    - **Initial authorization**. Granted by signature after reviewing the initiation of the permit, supporting method statements / risk assessments and working plans to ensure that those plans and precautions are adequate for the work.
    - **Daily authorization**. Granted by signature before start of work on each day, after confirming that PTW remains valid and that it is safe to proceed taking account of the particular circumstances of the day.

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Authorizer
  - Review PTW to ensure it has been completed fully and that all safety aspects are fully understood.
  - Inspect workstation to verify it has been prepared and all precautions are in place.
  - Ensure all necessary isolations have been made.
  - Ensure all related documentation is with the permit.
  - Carry out any atmospheric tests necessary, immediately before authorization and record on the permit before issue.
  - Determine frequency of any re-tests or continuous monitoring and indicating this on the permit and/or the requirement for continual monitoring.
  - Ensure general conditions are satisfactory and suitable for issue of the permit.
  - Continued on next slide…

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Authorizer
  - Stipulate start and finish time on each day the permit is issued.
  - Before signing each day, discuss the PTW with the Permit Holder to confirm that he/she fully understands the PTW details, limitations and conditions.
  - Withhold the permit if there is any doubt about work to be done, conditions, precautions, or any other aspect that is considered unsatisfactory.
  - Withdraw PTW where necessary, e.g. as a result of violations, changing conditions or site emergency.

Requirements for Permit to Work (PTW) Procedures

- **Key points – responsibilities of Permit Holder (work supervisor)**
  - Ensure team is inducted, including additional induction for the Work Supervisor.
  - Ensure full understanding of work to be done, limits to the authorized work and precautions that must be taken.
  - Sign PTW to confirm that conditions are fully understood and will be adhered to.
  - Obtain Operations Representative's signature in the daily validation section of the PTW form, before taking the 'A' copy to the workstation.
  - Check that it is safe to start work.
  - Ensure safe practices and work in accordance with the PTW.
  - Carry out periodic self-audits of the workstation.
  - Retain copy 'A' of the PTW at the workstation.
  - Continued on next slide...

Requirements for Permit to Work (PTW) Procedures

- Key points – responsibilities of Permit Holder (work supervisor)
  - Stop work and notify site personnel if working condition change and/or become unsafe.
  - If emergency is declared, stop work and follow Terminal instructions/procedures.
  - Ensure that for 30 minutes after hot work stops, work area have a fire watch in place until released by the site fire-check.
  - Leave workstation safe and tidy at end of each work period.
  - Ensure PTW is signed-off on completion of work and returned to Permit Initiator.

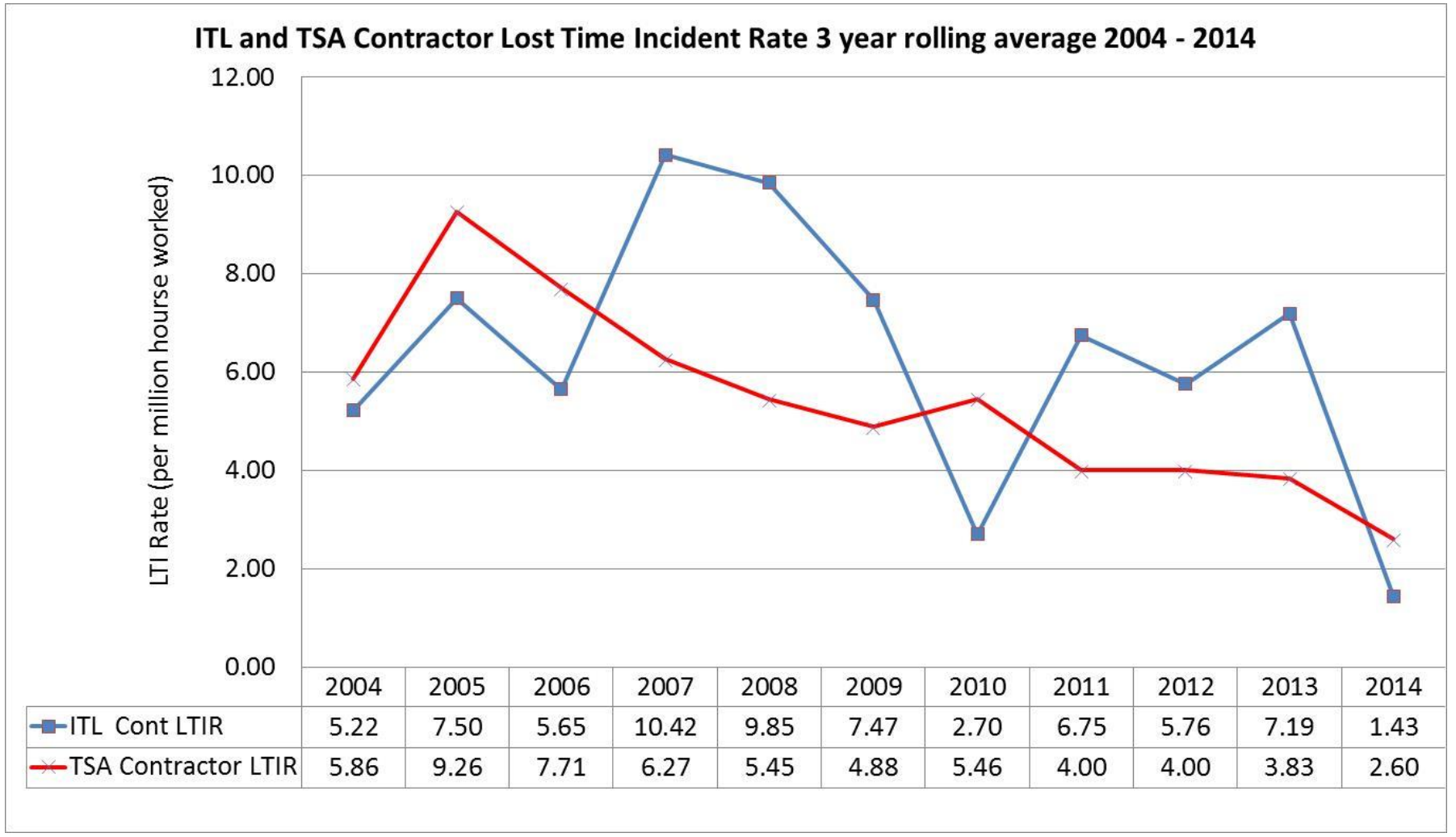
Requirements for Permit to Work (PTW) Procedures

- **Key points – responsibilities of Shift Supervisor**
  - Review permit details against operational activities that are being carried out.
  - Ensure any doubts about the permit/working conditions are discussed with the Authorizer before issue of the permit.
  - Counter-sign Permit (A and B copies) immediately before issue, as a confirmation that there are no operational activities taking place which may conflict with work being carried out.
  - Regularly review work activities to confirm that operational activities do not alter the working environment and/or the conditions specified on the permit.
  - If there is a change of shift while the permit is still 'live', ensure that the oncoming Shift Supervisor is made fully aware of all work being carried out.

Contractor Personal Safety

	2012	2013	2014	To end November 2015
Lost Time Injuries	0	1	0	1
First Aid Cases	7	5	2	1
Medical Treatment Cases	1	1	0	2

Contractor Personal Safety Performance



	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
ITL Cont LTIR	5.22	7.50	5.65	10.42	9.85	7.47	2.70	6.75	5.76	7.19	1.43
TSA Contractor LTIR	5.86	9.26	7.71	6.27	5.45	4.88	5.46	4.00	4.00	3.83	2.60

Contractor Process Safety Performance

Terminal	Incident	Internal Classification
	An expansion joint in a 5” stripping line for the main jetty line failed releasing fuel oil to the water.	Release event
	200 litres of gasoline released from valves left open from proceeding operation carried out by contractor. Product spilled on impermeable surface. No release to water. Reportable to the authorities as a Seveso incident.	Release event
	Sulphuric acid released when contractor drilled into line in service.	Critical contractor non-conformance

Contractor/mobile scaffold fall – reportable lost time incident

- Immediate causes
  - There were high/ gusting winds on the day.
  - It is probable that two of the mobile scaffold's casters were on unmade ground.
  - No stabilizers, outriggers or ties were used.
  - Weight/movement on the working platform.

Contractor/mobile scaffold fall – reportable lost time incident

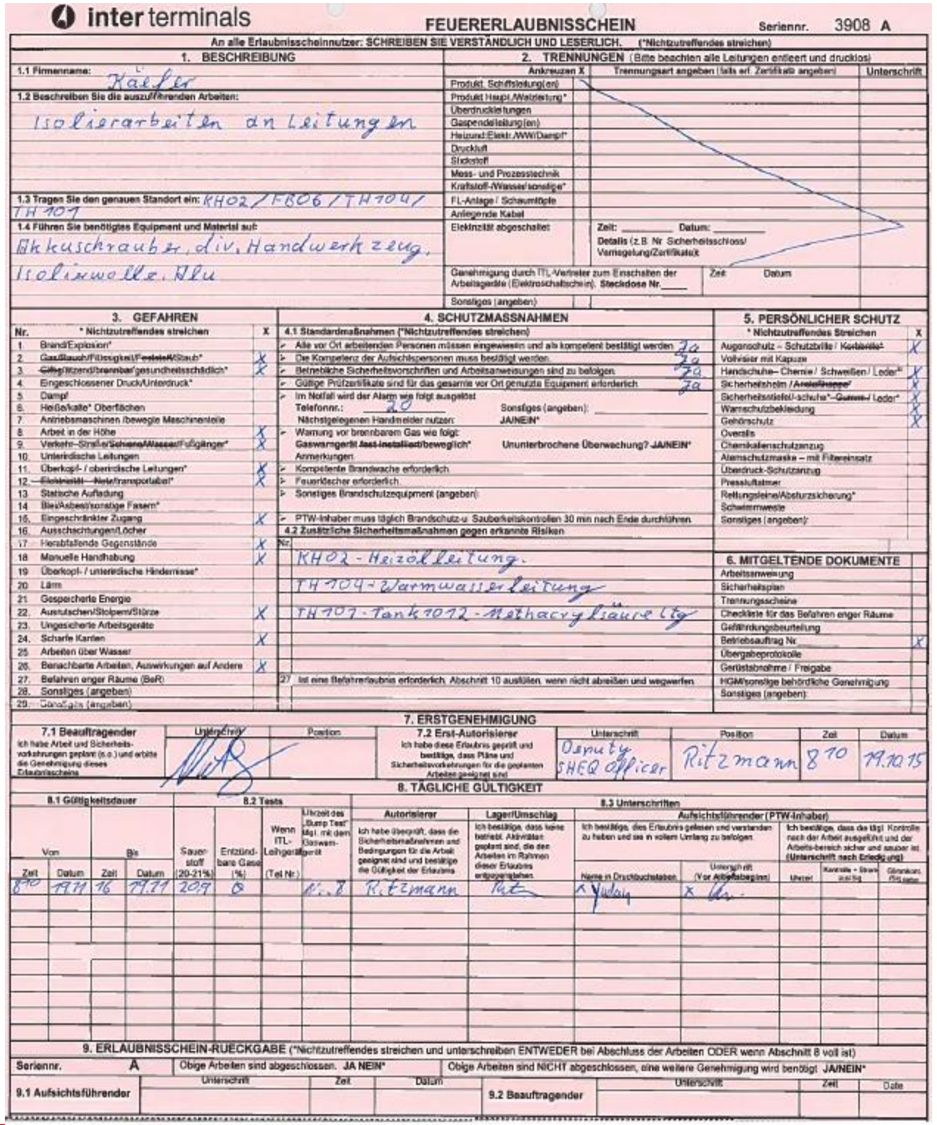
- Underlying issues - Contractors
  - The 2 workers involved in the incident were sub contractors employed by the main contractor. Only the main contractor was on the terminal's approved contractor list.
  - Terminal only had generic RAMS for contractor. Nothing specific for the job.
  - Contractor's own specific risk assessment (not submitted to Terminal pre work) did not highlight work at height as hazard. Did highlight wind as hazard, but no precautions stated.
  - Mobile platform belonged to the terminal's regular painting contractor. Used out of convenience as it was in situ. 3 of the castors had no means of being secured to the scaffold legs.

Contractor/mobile scaffold fall – reportable lost time incident

- Underlying issues – Work Planning
  - Job discussed on site between main contractor and Ops Supervisor.
  - Operator/deputy SHEQ officer, along with Ops Supervisor prepared PTW on morning of incident.
  - No RAMS requested.
  - Low risk assigned to the job in works planning meeting. Seen as 'small' job.
  - Planning listed 11 other jobs on the day, 10 high risk, 1 medium.

Contractor/mobile scaffold fall – reportable lost time incident

- **Underlying issues – Permit to Work**
  - General in nature - 4 locations for insulation work included.
  - Height hazard noted, but no control measures specified.
  - PTW initiated by Ops Supervisor. Initial authorisation, daily authorisation and ops validation all signed by Operator/deputy SHEQ officer.
  - Routine at the Terminal for Ops/SHE to initiate and authorise without any evident engineering input.


inter terminals FEUERERLAUBNISSCHEIN Seriennr. 3908 A

An alle Erlaubnisscheinnutzer: SCHREIBEN SIE VERSTÄNDLICH UND LESERLICH. (*Nichtzutreffendes streichen)

1. BESCHREIBUNG

1.1 Firmenname: Kaefer

1.2 Beschreiben Sie die auszuführenden Arbeiten: Isolierarbeiten an Leitungen

1.3 Tragen Sie den genauen Standort ein: KH02 / FB06 / TH104 / TH107

1.4 Führen Sie benötigtes Equipment und Material auf: Akkuschrauber, div. Handwerkzeug, Isolierwolle, Alu

2. TRENNUNGEN

3. GEFAHREN

4. SCHUTZMASSNAHMEN

5. PERSÖNLICHER SCHUTZ

KH02 - Heizölleitung
TH104 - Warmwasserleitung
TH107 - Tank 1012 - Methacrylsäure Ltg

6. MITGELTENDE DOKUMENTE

7. ERSTGENEHMIGUNG

7.1 Beauftragender

7.2 Erst-Autorisierer: Deputy SHEQ officer, Ritzmann, 8 10, 19.10.15

8. TÄGLICHE GÜLTIGKEIT

8.1 Gültigkeitsdauer

8.2 Tests

8.3 Unterschriften

9. ERLAUBNISSCHEIN-RUECKGABE

9.1 Aufsichtsführender

9.2 Beauftragender

Contractor/mobile scaffold fall – reportable lost time incident

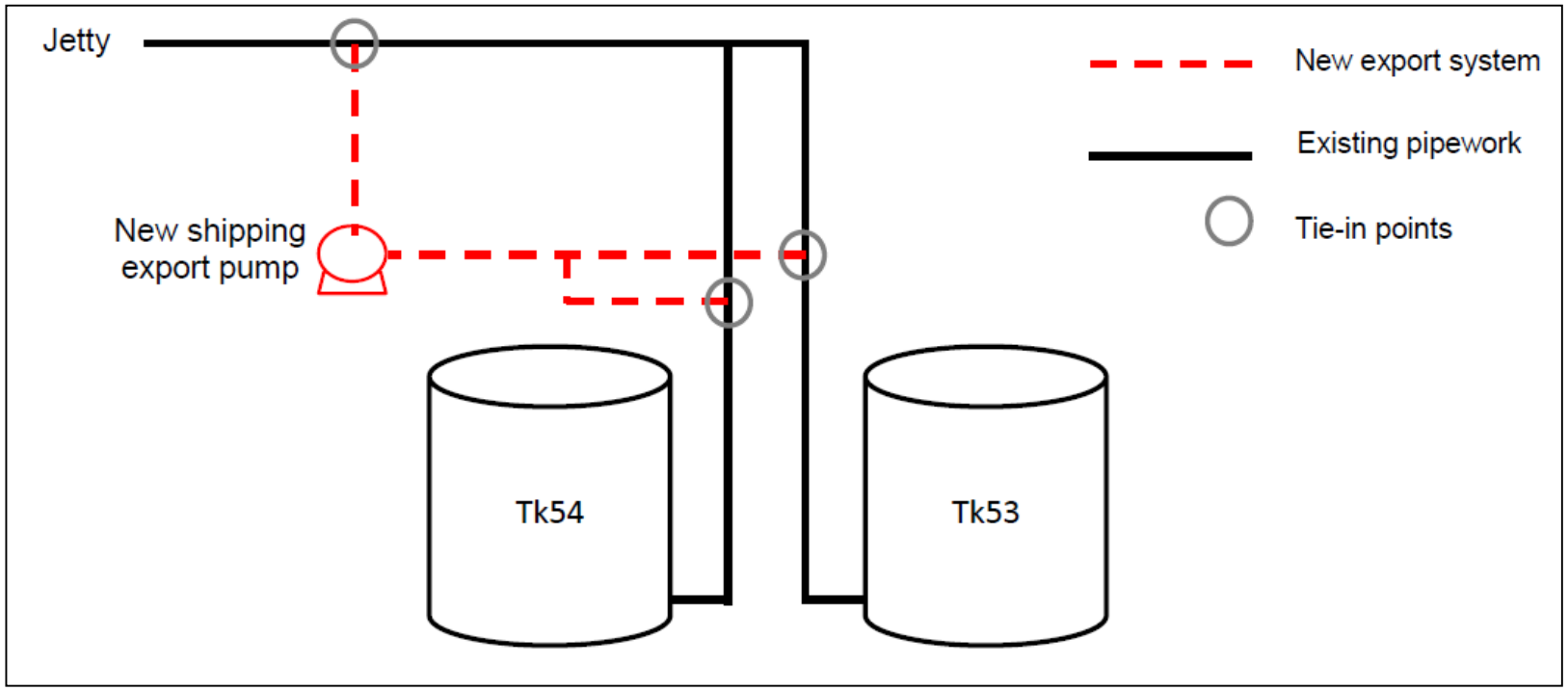
- Underlying issues – Monitoring of Work
  - Terminal has alarm for high winds. However this had not been reset since being activated on 13/11/15, so it didn't sound on 19/11/15. Even if it had, action would only have been to suspend work on fixed scaffolds, not mobile scaffolds.
  - No inspections or audits of job. Personnel very busy with other works and work at height had been incorrectly assigned low risk status.

Lagging event - Contractor drilled into line containing sulphuric acid

- What happened?
  - Workers from a contractor company drilled into a pipeline and sulphuric acid was released.
  - Nobody was hurt.
  - Contractors were wearing full personal protective equipment (PPE), including chemical suit at the time.

Lagging event - Contractor drilled into line containing sulphuric acid

- Work Involved
  - Modifications to facilitate export of sulphuric acid to ship from Tanks 53 and 54.
  - 3 points at which the new export lines were to be tied in to existing pipework.



Lagging event - Contractor drilled into line containing sulphuric acid

- Pipeline clearing isolation
  - Physical isolation was not in place.
  - Valve-only isolation on both Tank 53 and 54 lines. Manager authorisation for valve only isolation was not in place
  - Terminal reported that, in April 2015, Terminal personnel had plan to empty Tank 53 to below the level of the tank line inlet, to allow work with valve isolation. Option eventually implemented in advance of break-in work in October 2015, but only on Tank 53.
  - Tank 54 still contained a substantial quantity of product.
  - Project Engineer and contractors believed lines would be emptied of sulphuric acid when the time came to do the break-in work, with only residues remaining.

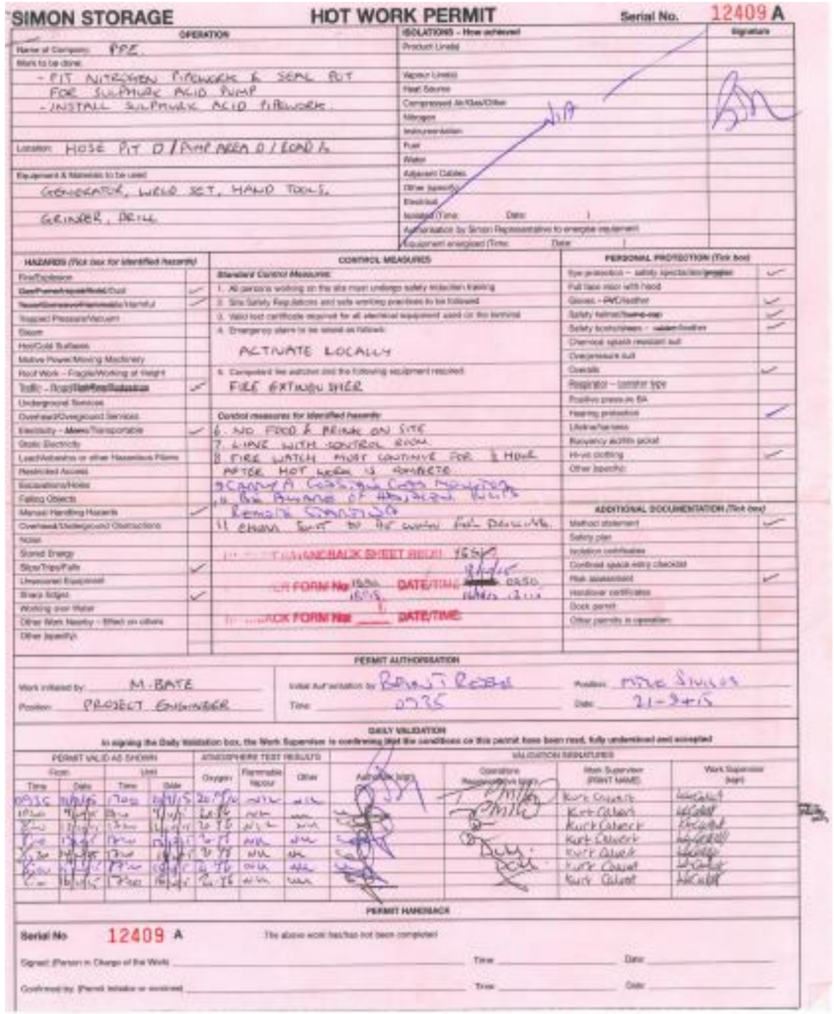
Tank 53 and 54 tie-ins

Lagging event - Contractor drilled into line containing sulphuric acid

- Handover
  - Handover sheet was raised.
  - Scope of Works given as “Break-ins for installation of sulphuric acid pipework Tank 53/54 export system”.
  - Terminal personnel had completed Section 1 on behalf of Project Engineer.
  - Sections 2 and 3 sheet gives details of isolation method, including: “Sulphuric Acid Import Line 16XD at D Pit. Tk 53 – Tankline – D Pit to Tankside.”
  - Mismatch between Section 1 (covering both Tank 53 and 54) and Section 3 (covering Tank 53 only) is noted.
  - Handover sheet was attached to PTW but contractor supervisor couldn’t recall reading it.

Lagging event - Contractor drilled into line containing sulphuric acid

- **Permit to Work**
  - Initiator trained in PTW but not on authorised list in Terminal procedure.
  - Work given generally as 'Install Sulphuric Acid Pipework'.
  - Isolations section struck through with 'N/A' entered.
  - Hazards section did not note corrosive hazard of sulphuric acid.
  - PPE section did not specify right equipment for protecting against sulphuric acid.
  - While issuing the PTW, verbal instructions were given to contractor not to proceed with line break-ins until further checks were made with Operations.



SIMON STORAGE HOT WORK PERMIT Serial No. 12409 A

Serial No 12409 A

Lagging event - Contractor drilled into line containing sulphuric acid

- Underlying issues
  - Knowledge/experience
    - Project engineer and safety officer relatively inexperienced
  - Perceived time pressure
    - After many delays, sense of pressure to get work done during week of incident.
  - Non-compliance with existing standards/ procedures for:
    - review of contractor RAMS and preparation of a consistent PTW;
    - physical isolation of plant before handover, or Terminal Manager authorisation for a less robust method of isolation;
    - using PTW as a formal, written means of communicating to contractors precisely what work they are being authorised to do.

Lagging event - Contractor drilled into line containing sulphuric acid

- Underlying issues
  - Communication with contractors
    - A PTW must not be issued if it authorises any work that the Terminal does not want to be done, or has not prepared for, at that time.
    - Formal, written PTW system must always take precedence over verbal instructions, so open are the latter to misinterpretation.
  - Project engineering – Terminal communications
    - Lack of clear and open communication between project engineering and Terminal personnel.
    - Failure to co-operate on work planning.

SHE Team investigation carried out. Full report with improvement actions issued.

Following a number of contractor incidents, the Company decided to introduce a programme on minimum safety standards in key areas via it's TAKE 2 programme and the '8 core principles for safety'

- The eight core principles
  - ✓ Work at height
  - ✓ Permit to Work
  - ✓ Lock out tag out (electrical and plant isolations)
  - ✓ Confined space entry
  - ✓ Management of Change
  - ✓ Product handling
  - ✓ Excavation work
  - ✓ Motorised vehicles

Note that key contractor safety areas/ concerns are covered

T A K E 2 Take 2 minutes to make sure you do every job safely, every time

- ✓ Talk
- ✓ Action
- ✓ Knowledge
- ✓ Equipment
- ✓ 2 minutes

Summary

- Contractors are routinely employed to do a lot of the most hazardous work.
- Companies have legal and moral duties to manage contractors effectively.
- Ensure there are robust systems in place for:
    - Selection, Monitoring and Review of Contractors
    - Permit to Work
    - Guidance on the Construction Design and Management (CDM) Regulations 2015
- It is fundamental to maintain strong contractor control and strict adherence to PTW requirements at all sites.
- Ensure that personal and process safety is led from the top of the organization and that there is a nominated Board member responsible for safety.
- Ensure sufficient resource to routinely audit compliance and to carry out thorough incident investigations
- Ensure that safety is effectively managed and properly discussed at Board meetings and at management and site level.

Thank you

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