

Task Risk Assessment

Prepared for the CONCAWE Safety Management Group by the Special Task Force on Task Risk Assessment (S/STF-6)

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ABSTRACT

Task Risk Assessment (TRA) is presented, what it is and how it is used in the petroleum industry. Typical techniques are covered with respect to the area of business (upstream/refining/marketing/retail) and the extent of risk exposure. The selection of the appropriate process is explained. The techniques described include verbal and written procedures, the written ranging from simple proformas to qualitative tabular and matrix methods. Examples are given.

This review of TRA has been prepared to publicize to a wider audience how the petroleum industry procedures are controlling the risk to their workers, also meeting the intent of the Framework Directive 89/391/EEC.

KEYWORDS

CONCAWE, petroleum industry, risk assessment, safety, safety management, task risk assessment.

NOTE

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1. INTRODUCTION

The European Framework Directive on Minimising Risk to Workers No. 89/391/EEC requires all member states to have legislation in place to encourage improvements in the safety and health of workers. Risk assessment is the basis for this improvement.

This report describes and provides examples of how risk assessment for work activities is performed in the petroleum industry, ranging from routine tasks to those involving higher risk or novel circumstances. This includes the following:

- Describe the risk assessment steps for task activities; defining the workscope, identifying the hazards, assessing the risks, selecting the controls
- Review the applicability of such techniques in selected areas of the business; upstream, refining, marketing, retail.
- Specific examples of these risk assessments in selected areas of the business.

As for any safety promoting activity, risk assessment as described herein will only be effective in a management environment which encourages, provides resources and monitors progress, developing the support of the workers involved. This is briefly covered in the context of a Safety Management System.

2. DEFINITIONS

| | |
|------------------|--|
| Hazard | the intrinsic property of a substance, equipment or physical situation with potential to cause harm. |
| Risk | the likelihood of harm being realised. |
| Risk Assessment | the process of identifying hazards, evaluating the risks and specifying control measures. |
| Task | a discrete work activity. |
| Procedure | a detailed set of instructions to be followed in the carrying out of a task. |
| Method Statement | a series of tasks which combine together to achieve a project or maintenance activity. |

3. BACKGROUND

All activities expose people to hazards whether in the home or at work. The reduction of risks within the workplace has long been the focus of attention both through industry initiatives and legislation.

The petroleum industry has inherent hazards due to the processing and handling of hazardous materials. As such it has long recognised the need to use specific tools, such as the work permit system and hazard and operability (HAZOP) studies, to identify risks and, where appropriate, prevent or reduce the impact to workers, the environment, external populations and company assets. The downward trend illustrated from accident statistics over the years is an indication of the effectiveness of the tools used.

The most potentially powerful tool is a Safety Management System. This details the way a company systematically manages its activities to ensure safe operations at all levels of the organisation. Risk assessment is a fundamental part of any company's Safety Management System.

Risk assessment is also the cornerstone of many current regulations. One of the early key pieces of legislation to cover risk assessment was the Seveso Directive 501/82/EEC², since revised as the COMAH Directive 96/82/EEC³, which deals specifically with major hazards associated with process plants.

There are also specific health risks connected with exposure to chemical, physical and biological agents which are the subject of Directive 80/1107/EEC⁴, since updated in Directive 88/642/EEC⁵, on the protection of workers from harmful agents.

The Framework Directive 89/391/EEC¹ concentrates on risks connected with the activity of workers in their work environment and Task Risk Assessment (TRA) as explained in this document specifically meets this need. Existing procedures, standing instructions, operating manuals and emergency plans will typically incorporate the results of risk assessment. For example, operating procedures define how to perform activities, such as lighting a process furnace, which incorporate the preventive and protective measures to adopt in order to control such risks.

So what's new with The Framework Directive on minimising risks to workers? The answer is that there are no new obligations for the petroleum industry, only the necessity to review and document systematically the risk prevention and protection measures implemented.

4. RISK ASSESSMENT - INFORMAL OR STRUCTURED?

Risk assessment is fundamental to the culture developed under a Safety Management System, in a real sense it is part of every work activity whether formal or informal.

No matter whether you are doing a task risk assessment upstream, on a refinery, a distribution terminal or service station - the basic steps are the same and these are presented in **Section 5**.

The application to the various sectors is discussed below and some typical examples of tasks for which formal TRAs would be completed are given in **Appendix 1** for each business area.

4.1. UPSTREAM AND REFINING

In process plants the risk involved ranges from the trivial to the potentially serious. There is therefore a corresponding increase in the importance of the risk assessment. This is particularly true for upstream and refinery activities where there is a wide range of factors which can affect risk. In this case, risk assessment can best be managed by setting a priority threshold level. Above this threshold or "trigger" level, the risk assessment needs to be managed in a structured manner and be formally documented.

Below this "trigger" level is work which may be routine and has trivial risk; for example, making normal walk-around visual checks of equipment. Also there may be work that has limited risk and is either familiar or is within the scope of standard skills training; for example a refinery operator isolating and draining a pump prior to preventative maintenance, or a mechanic cleaning a product strainer at a marketing terminal loading bay.

The safe performance of these routine tasks relies on craft skills, the use of properly designed and maintained equipment and adherence to standard risk assessed procedures. Risk levels are normally expected to be low although conditions will vary somewhat with each job location.

Even at this low risk level, however, an informal risk assessment needs to be made by those involved before commencing the work. It requires the responsible supervisor and the individual worker, or the group involved, to take time to discuss and evaluate that the task is indeed as straightforward as expected and conditions do not exist which might change that. Commercial training programmes have often been used in the petroleum industry to ingrain this hazard spotting and risk awareness into the working culture. Depending upon local culture, asking the workers themselves to briefly write down this informal risk assessment can help encourage their commitment to this process of evaluating the possible risks. **Appendix 3 Items 1 and 5** show example forms for this purpose.

For work activities which do not fall into this lower risk level, it is recommended to trigger a more formal Task Risk Assessment (TRA) which would normally be documented. Criteria for assessing when a TRA is required may be as follows:

- Tasks which have potential for serious personal injury / illness, or environmental impact, or equipment damage.
- Tasks where change or novelty is involved. This would include:
 - a) using new equipment, or familiar equipment for a new purpose or in different conditions;
 - b) working under new conditions, either caused by a change in the environment or location of the task;
 - c) following new procedures, or an unfamiliar combination of existing procedures.

No matter the precise circumstances, the responsible supervisor should always consider whether a TRA could add value to the task planning. It may be of particular value when communication interfaces are involved, for example, workers in different locations or from different organisations.

The product of the TRA would typically be a written procedure in which appropriate controls are defined. The process is described in **Section 5** in some detail.

Some tasks requiring TRA's may be repeated. For a regularly repeated task, the risk assessed procedure would be the subject of training and periodic review to ensure it is still valid. Retaining the documented TRA will allow future users to understand the reasoning behind the specified controls. In subsequent use, if the responsible supervisor has determined that there has been no change in conditions, it is not necessary to repeat the TRA itself but only to maintain the controls as originally developed. However, it is recommended that the TRA should be reviewed after a prescribed interval, to ensure that the conditions have not changed and the control measures are still adequate.

For tasks which are more complex, or repeated less often, or involve teams with personnel changes, there is increasing incentive to perform refresher training before commencing. The TRA documentation is an ideal focus for this activity.

4.2. DISTRIBUTION

Distribution facilities typically have a more limited number of routine tasks but with a similar variety of risks. As with refining and upstream activities, there are also tasks in distribution facilities which rely on craft skills, for example, pump maintenance. However, on this type of facility, it is usually manageable and reasonable for the most substantial routine tasks, as well as the non-routine tasks, to make a formal risk assessment (TRA) whether the task have low or high risk. A typical list of tasks can be found in **Appendix I**.

4.3. RETAIL

Retail establishments have a lower number of routine tasks involving risk than distribution facilities. Whether or not these tasks have associated written procedures, a documented and systematic TRA would usually be beneficial - even where the risk is low in comparison to the level of risk present in many refinery tasks which may not receive a TRA.

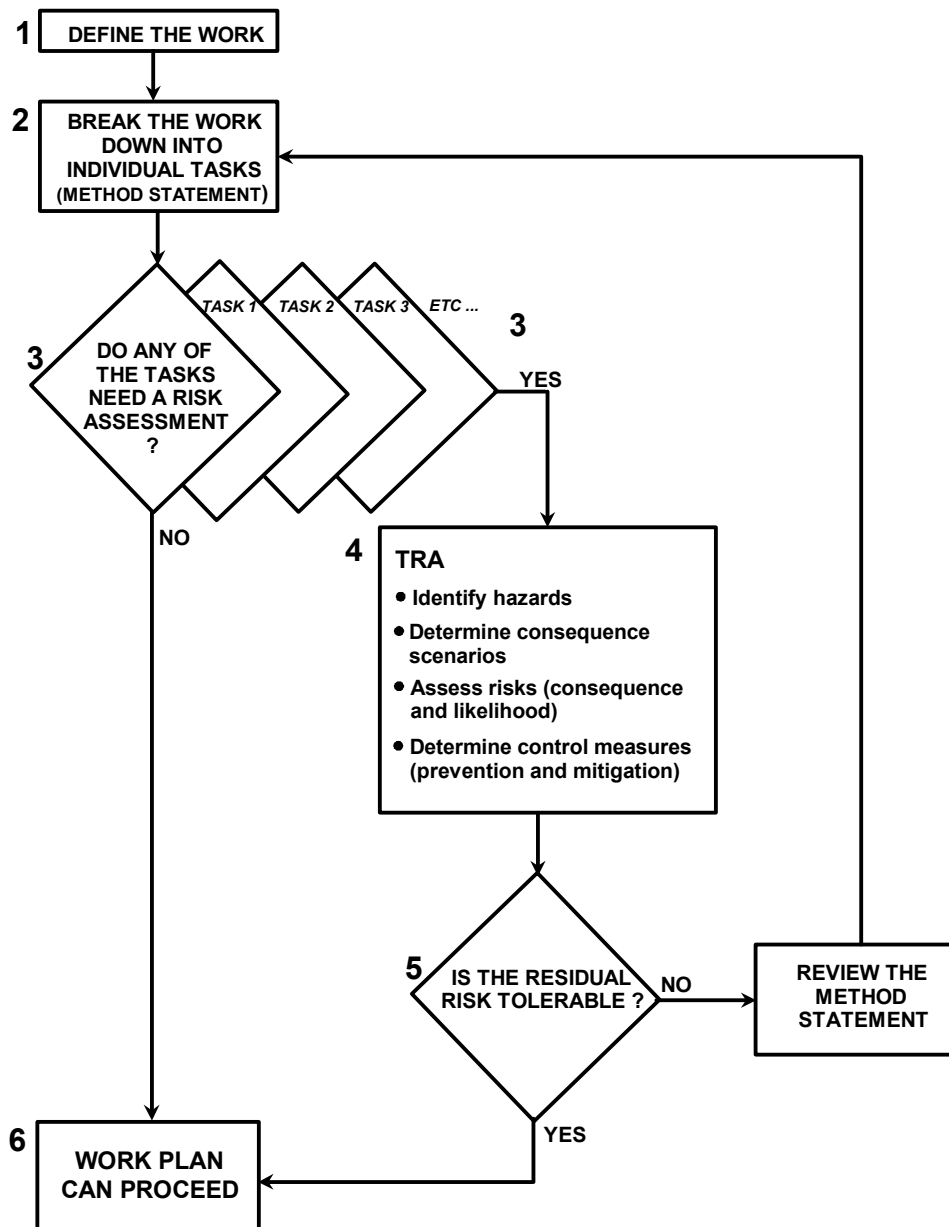
Corresponding to the much lower risk exposure, the main difference in circumstances within retail outlets is the fact that the workers involved do not have the same skill level as those found at a distribution terminal, refinery or upstream installation. There is also likely to be a higher turnover in workers, and additionally there are members of the public potentially exposed to these hazards. The benefits from formalising task risk assessments in these types of facilities is to provide the workers with specific information, training and awareness of the hazards, to ensure risk controls are effective.

Non-routine tasks, e.g. underground tank repairs, with a greater associated risk are normally carried out by specialist personnel. The person doing the work is likely to be the expert in assessing risks, but the documented results of the TRA should be available through discussion to the site workers for their information, hazard awareness and emergency preparedness.

5. RISK ASSESSMENT PROCESS

The following flowchart (**Figure 1**) shows the task risk assessment process in outline.

Figure 1 Flow Chart for Task Risk Assessment (TRA)



It is important that the supervisor responsible for the work conducts the risk assessment using a team of people who will be involved in the work and who can offer the necessary expertise to evaluate the risks arising. In some cases others with specialist knowledge or experience may need to join the assessment team.

Line management supervisors need to allocate competent persons to conduct risk assessments. Competent persons should have appropriate training and the following qualities:

- practical and theoretical knowledge of the hazards, possible effects and preventive and protective measures;
- awareness or experience of the work and workplace conditions which exist.

It is important that competent persons are able to make sound judgements and recognise the extent and limitations of their own competence.

Assessments of low level (trivial) risks may be carried out by one person, but for large or complex tasks which require a TRA, it is preferable to have a team approach to obtain the relevant range of knowledge and test the thought process.

STEP 1

Referring to **Figure 1**, the starting point is to produce an overall description of the workscope; for example, the construction of a vapour recovery unit at a marketing terminal or the repair of an underground storage tank at a retail site. The workscope should also include a clear description of the geographical area.

STEP 2

For larger workscope examples, such as noted above, the work needs to be divided into discrete tasks, which may collectively be referred to as a method statement. A refinery maintenance example is given below (**Figure 2**). This would be expected to prompt a site visit by key personnel responsible or involved in the work, to assess and agree the method statement.

Figure 2 *Example of Method Statement*

| Refinery example - Repair Leaking Naphtha Line |
|---|
| <ul style="list-style-type: none">• Process to drain line• Handover to Maintenance• Provide access to lines• Position crane• Cut out corroded section of line• Lift out section and remove to safe location• Weld on slip on flanges• Install new section of line• Remove crane• Remove spades• Handover to Process to recommission• Remove corroded pipe to scrap yard. |

STEP 3

Once the method statement has been developed and broken down, then each task should be reviewed in turn to establish whether or not any formal TRAs need to be conducted. This involves an information gathering phase as illustrated in **Figure 3** below.

If a TRA is required, the first question to be asked is whether a formal TRA already exists, perhaps even at other locations within the company. If a TRA exists, then it should be reviewed to establish whether it is still appropriate and applicable. Where an existing TRA is used, care should be taken to ensure that risks in the current working environment are similar to those assumed previously, (see **Section 4.1**). A site inspection would be valuable at this time after which any changes noted can be used as feedback into the risk assessment process.

Figure 3 Information Gathering

- What is it?
- Where is it?
- When is it to be done?
- How is the job to be done?
- Who will do the job?

- Trades / Skills required
- Equipment required
- Standards required e.g.
 - ⇒ area preparation
 - ⇒ job procedures
- Interfaces with other groups

STEP 4



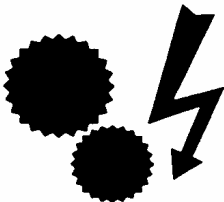

For a task where a new or re-evaluated TRA is required, this is conducted using the following steps:

A. Identify Hazards

There are many techniques which can be used to identify hazards and some of these are already well established and used in the industry, one such example is the "WHAT IF" technique. This originates from the question; what could go wrong ? or what if should occur ? This involves assuming that each part of the equipment or step of the procedure fails, in turn.

Brainstorming is another way to identify hazards, using a small group of people. The team is given a description of the work activity and they each contribute ideas for hazards that could be present in the task. These hazard identification processes can also be supported by checklists with relevant questions or topics; an example is given in **Figure 4** below, and more in **Appendix 2**. Note that this Appendix provides examples of chronic health issues which need to be recognised, for example noise or radiation exposure, as well as the perhaps more obvious acute concerns such as falling or asphyxiation.

Figure 4 Hazard checklist

| | |
|---|--|
| HAZARDS FROM THE PROCESS | |
|  | <p><i>DAMAGE TO THE ENVIRONMENT</i></p> <p><i>FIRE</i></p> <p><i>FLAMMABLE SUBSTANCES</i></p> <p><i>HAZARDOUS SUBSTANCES</i></p> <p><i>HOT / COLD MATERIALS</i></p> <p><i>PRESSURE</i></p> <p><i>THERMAL RELIEF</i></p> <p><i>TRAPPED ENERGY</i></p> |
| HAZARDS FROM THE LOCATION | |
|  | <p><i>CONFINED SPACES</i></p> <p><i>FALLS</i></p> <p><i>FALLING OBJECTS</i></p> <p><i>UNEVEN SURFACES</i></p> <p><i>SHARP EDGES</i></p> |
| HAZARDS FROM THE WORK / TOOLS | |
|  | <p><i>ELECTRIC SHOCK</i></p> <p><i>HEAVY LOADS</i></p> <p><i>MOVING MACHINERY</i></p> <p><i>PROJECTILES / PARTICLES</i></p> <p><i>SPARKS</i></p> <p><i>VIBRATION</i></p> |
| HAZARDS FROM THE PEOPLE | |
|  | <p><i>ASSUMPTIONS</i></p> <p><i>AWKWARD BODY POSITION</i></p> <p><i>LACK OF SKILL / EXPERIENCE</i></p> <p><i>POOR COMMUNICATION</i></p> <p><i>TAKING ACTION IN THE WRONG ORDER</i></p> |

B. Identify Incident Scenarios

Having identified the hazards arising from the task, the team can develop incident scenarios and their consequences. For this to be successful, it is important to define scenarios leading to consequences which are realistic and credible.

C. Assess Risks

The level of the risk should be estimated by considering the potential for harmful consequences and the probability that these will occur. To help focus the team on the more important concerns, a general appreciation for the level of consequence and probability should be established. This can be handled by use of a tabular listing of hazards, consequences and risks with agreed priorities or by the use of a risk matrix, like the one in **Figure 5** below. Examples of both methods are given in **Appendices 3 and 4**. A systematic approach is essential to promote consistency in determining whether an incident scenario is a tolerable risk.

Figure 5 Risk Matrix - Basic Format

| PROBABILITY CONSEQUENCES | HIGH | MEDIUM | LOW |
|-----------------------------|------|--------|-----|
| HIGH | H | H | M |
| MEDIUM | H | M | L |
| LOW | M | L | L |

D. Determine Control Measures

If the risk exposure is judged to be too high, further preventative measures (to reduce the probability of the scenario) and protective measures (to reduce the severity of the consequences) should be developed by the team. The following lists (**Figures 6 and 7**) illustrate some technical and procedural controls.

Figure 6 Examples of Preventative Measures

- Refresher training of procedures
- Substitution of hazardous materials
- Mechanical instead of manual handling
- Equipment limit stops
- Dead man's handles
- Interlocks
- Crane lifting studies
- Employing specialist workers
- Auditing that controls remain in place

Figure 7 Examples of Protective Measures

- Physical barriers
 - ⇒ guards
 - ⇒ distance
 - ⇒ spades
 - ⇒ insulation
- Additional personal protective equipment
- Alternative escape routes
- Flammable gas detectors
- Emergency procedures

The team use the table or matrix to focus on proposing relevant control measures to reduce the risk. Such control measures should be considered to reduce the probability or the consequences of the event.

For example, the wearing of a safety harness while working at height could change the consequence of falling from a fatality to a minor incident, but the probability of falling remains the same.

On the other hand, consider using a fume cupboard for someone who is working with hazardous vapours. In this case the probability of exposure is reduced by the fume cupboard extracting the substance, however the consequence to the operator may be unchanged if the ventilation system fails.

Controls should be applied in order of their effectiveness, as follows:

- elimination / substitution (the concept of inherent safety)
- engineering (to protect at source)
- organisation / procedures / training
- personal protective equipment

The table or matrix can then be used to examine the reduction in risk achieved by these controls on the original scenario.

STEP 5

The residual risks should be reviewed and control measures selected until it is determined that the risk level is within the set tolerable range.

There may be cases when there still remains residual risk which the responsible supervisor or his risk assessment team remain concerned about or do not wish to accept. This might typically occur for a residual low probability but high consequence event, or where there is a high cost to achieve a tolerable risk level. In some cases, it may be necessary to modify the method statement. A judgement has to be made by the appropriate level of management, as well as by the workers involved, as to whether the risk is tolerable. Perhaps further study of the risk exposure will be prompted. More detailed analysis, for example of equipment reliability data or incident statistics and perhaps even quantitative risk assessment techniques, might be used to provide additional information in special circumstances to help clarify the judgement.

6. MANAGING TASK RISK ASSESSMENT

Many of the features of an effective Safety Management System, are indistinguishable from a sound business management system. A risk management system is an essential and integral part of the overall Safety Management System.

This section focuses on particular features associated with the management of TRA. For a more general background on the subject of Safety Management Systems, refer to other sources on this subject such as the COMAH Directive³, Managing Safety API 750⁶, Successful Health and Safety Management⁷ and CONCAWE's report on Managing Safety⁸. A UK pamphlet on TRA⁹ is reproduced in **Appendix 5**.

More recently, the European Commission has published a booklet to help employers meet the requirements of 89/391/EEC, entitled Guidance on Risk Assessment at Work¹⁰. This includes discussion on management of the process in a general context.

6.1. LINE MANAGEMENT ROLE

In order to encourage a working culture in which the TRA system can flourish, it is vital to obtain active commitment from senior management. Support should be positively demonstrated through personal activity, allocation of resources for training and operating the system, which includes manpower resource and allowing time for the risk assessments to take place.

It is important to ensure that the agreed recommendations from a TRA are supported adequately. Ultimately all recommendations made by the team need to be accepted by management and in place before the task is carried out. Any subsequent changes proposed need to be properly evaluated.

6.2. COMMUNICATION

Communicating the results of a TRA is one of the fundamental stages of a successful system for implementing risk assessment. There will be people doing the work, and others who may be affected by it, who were not directly involved in the risk assessment process itself.

Within the industry the permit to work system is a key step in the risk management system, which provides a description of the job and the preventative and protective measures to be implemented to ensure safe performance of specified work. This channel is a natural opportunity for communicating the TRA findings to the workers directly involved. Particularly where the permit to work system is not used, other methods of communicating these assessments can be through training or information packages.

A retention system can be used to locate any TRAs which have been made previously. Such a system would therefore facilitate communication of assessments, giving both a reference point and avoiding repetition of previous assessment work.

Management need to set time limits for the review of repeat work TRAs, recognising that, as time passes, it will be prudent to re-do the risk assessment. This

encourages evaluation of new knowledge or change in circumstances, as well as offering an opportunity to train or refresh people who are expected to be repeating the work. The time limits for review could be a function of the task complexity, frequency of use and level of risk exposure.

6.3. AUDITING AND FEEDBACK

Auditing is an essential part of any management system and a risk assessment system is no exception. Each stage of the TRA process should be audited on a regular basis. TRAs (and other risk assessments) should be subject to review by existing committees, safety specialists, or experienced individuals to maintain quality control of risk decisions.

Workplace inspections are required to ensure that recommendations are adequately implemented, that controls are in place and that workers involved are sufficiently knowledgeable about the hazard consequences associated with those controls. Moreover, where risk exposure is below a trigger level and formal TRA has not been required, it is important to test whether the less formal worker risk assessments are being performed to an acceptable standard.

When an incident or near-miss occurs, it may provide an opportunity to review the effectiveness of the substitute TRA, via the following questions

- Were all controls identified actually in place?
- Were the TRA results communicated appropriately to all personnel involved ?
- Were any hazards associated with the work overlooked.

Analysis of collected incident or near-miss data may allow identification of a risk exposure concern which should be highlighted to people involved in TRAs.

6.4. EXTENDED USE OF METHODOLOGY

The tabular and matrix methods discussed in this publication can be used more generally for risk assessment purposes and some companies have chosen to do this by expanding the original scope of this process. Instead of just considering worker health and safety, they have also considered the possible consequences in other subject areas.

The following is a list of other subjects which may be considered:

- Safety & Health (external populations)
- Environmental Impact
- Financial Impact
- Public Disruption
- Lost Production (e.g. process downtime)
- Property / Assets Damage

- Inventory Loss (e.g. leaking tanks)
- Security

Experience has shown that it is more effective and efficient to integrate many subjects into a single risk assessment. Subjects chosen for this process will be very much dependent on the type of business activity. Examples of this process are given in **Appendix 4**, which show how consequence effects in different subjects may be assessed simultaneously in the examination of a particular incident scenario.

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APPENDIX 1 - WORK ACTIVITIES WHICH PROMPT TRA**1.1 TYPICAL ROUTINE TASKS FOR RISK ASSESSMENT IN RETAIL OPERATIONS**

- Truck Discharge
- Storage Tanks
- Filling Vehicles
- Small Vehicle Garage
- Check and Service Vehicle Wash
- Interceptor Checks
- Cleaning Forecourt Pumps and Vacuum Cleaners
- Handling Cash
- Administration Tasks in Office
- Storage of Oil (in small containers)
- Storage of Non-Oil Liquids
- Traffic and Parking
- LPG Storage
- Waste Disposal
- Shop Area - Stacking Shelves
- Cleaning Toilets

1.2 TYPICAL ROUTINE TASKS FOR RISK ASSESSMENT IN DISTRIBUTION OPERATIONS

- Road Truck Loading
- Shipping Duties
- Tank Dipping / Temperature / Sampling
- Tank Cleaning / Repair
- Hot Work
- General Duties
- Forklift Operation
- Sampling
- Water Draw-off
- Interceptor Cleaning & Maintenance
- Warehouse Work
- Steam / Water Pressure Cleaning
- General Office Duties
- Boiler Maintenance
- Filter Maintenance
- Weed Spraying
- Use of Hand Tools
- Product Testing
- Ladder Use
- Electrical Equipment & Maintenance
- Mechanical Maintenance

1.3 TYPICAL ACTIVITIES IN PROCESS PLANTS WHICH REQUIRE A TASK RISK ASSESSMENT

- Lifting and movement of heavy objects over live process equipment
- Machinery breakdown repair / maintenance
- Removing heat exchanger bundle from its shell
- Working inside a process vessel
- Dumping catalyst from a reactor
- Working with equipment where access is restricted
- Chimney repair
- Cleaning of a hydrocarbon storage tank

APPENDIX 2 - HAZARD IDENTIFICATION CHECKLISTS

2.1 HAZARD CHECKLIST

As it has already been acknowledged, there are a great many hazards in any workplace, the following table lists some possible categories and consequences:

| HAZARD CATEGORY | HAZARDS | CONSEQUENCES |
|-----------------|---|---|
| Chemical | dust vapour / gas particulates liquid solid flammable gas | respiratory disease poisoning, oxygen deficiency occupational disease burns, dermatitis, poisoning burns, fire / explosion fire / explosion, burns |
| Physical | noise ionising radiation slips, trips, falls compressed gas temperature manual handling explosion confined space | reduced hearing capability cancer bruise, fractured bone, fatality eye damage, tissue damage burns (cold and hot), fire chronic back injury, general injury fatality, fire oxygen deficiency, poisoning |
| Mechanical | rotating machinery mechanical lifting operation of vehicles | permanent disability cuts, bruising, abrasions fatality, damage to equipment |
| Electrical | static voltage >30 volts | shock, fire explosion shock, burns, fatality |
| Biological | microbiological organisms viruses | illness illness, fatality |
| Ergonomic | workstation layout moving equipment machinery design control room design process plant design | tiredness, headaches, fatigue equipment damage, injury inadequate use, injury inadequate control of plant inadequate operation of plant |
| Psychosocial | shift patterns work organisation | fatigue, inadequate motivation inefficient work patterns |
| Environment | humidity temperature lighting population space | fatigue inability to work adequately eye strain, headache fatigue inefficient work patterns |
| Natural | earthquake, rain, lightning, winds (hurricane) | structural and equipment damage, flooding, fire / explosion |

NOTE: the above table provides a limited sample of typical hazards and possible effects which could be found in the listed categories. Some of these hazards and possible effects could be listed in more than one category.

2.2 QUESTION CHECKLIST FOR HAZARDS

- how is the task going to be performed?
- what skills are required to perform the job, is additional training or supervision required?
- when is the task to be executed, could it be carried out at a more appropriate time (e.g. shutdown)?
- where is the task to be performed, could it be carried out in a safer location?
- are there any simultaneous operations which have a significant safety impact on the task (e.g. other tasks occurring as part of the same work scope, or other work in the adjacent area)?
- what hazards materials are involved (e.g. chemicals, combustibles - the materials within the system being worked on should be taken into account)?
- what hazards are introduced by tools and equipment to be used?
- what hazards are introduced by the circumstances of the job to be performed (e.g. day / night, exposure to weather, in a shutdown, simultaneous operations, etc.)?
- are there any location related hazards (e.g. working at height, in confined spaces, below ground, etc.)
- are there any installation related hazards (e.g. pressurised systems, extreme temperatures, etc.)?
- are there any adjacent areas (e.g. below, above, to the side) on which this task may have an impact?
- are there any safety systems involved whose function / availability may be impaired?
- does the task affect emergency contingency plans (e.g. restricting emergency exits, etc.)?

APPENDIX 3: EXAMPLES OF TABULAR RISK ASSESSMENT METHODS

3.1 “TAKE 3” ASSESSMENT

Guidelines for “Take 3” Assessment

- Must be used for all jobs with a permit
- Can be used for jobs that do not have a permit

How to use the Take 3 Assessment sheet

- Do the Take 3 Assessment at the workplace and keep it at the workplace, either with one of the people doing the job or with the permit
- Do the Take 3 Assessment for each job or at least daily if a job goes over 1 day
- Write down the steps, in sequence, for the job from start to finish
- Identify and write down what the hazards are for the steps and what the hazards can do to you and your workmates
- Write down what you are going to do to reduce the risk down to a low level
- If you cannot get the risk down to a low level then stop and inform your supervisor
- Everyone involved in the job participates and signs the Assessment sheet
- Repeat the process if the conditions or the people change (e.g. someone new joins the job)
- If there is a TRA produced for the task, make sure you understand it and use the Take 3 Assessment to write down any other hazards not referred to in the TRA
- The Take 3 Assessment does not replace the TRA
- Give the completed sheet(s) to your supervisor at the end of the day

| Take 3 Assessment | | Is there a risk assessment? | | Have you seen it? | |
|--------------------------|-----------------------|---|------------|---|---------------|
| Names / signatures | | Company | | Date | |
| Activity | What are the hazards? | What can the hazards do to me and my workmates? | H/M/L Risk | How can I lower the risk? By doing what? | Residual Risk |
| | | | | | |
| Overall risk | | | | | |

3.2 FURNACE REPLACEMENT RISK ASSESSMENT SUMMARY

**Practical Risk Management
Summary of Risk Assessment**

| Hazard | Probability | Consequence | Risk Level | Risk Reduction by: | Residual Risk |
|------------------------------|-------------|-------------|------------|--------------------|---------------|
| | | | | | |
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| Overall Residual Risk | | | | | |

Case Study

A new furnace is to be built close to an existing one, then lifted into position over a 6 m high pipeband containing an LPG line.
 Lifting over the pipeband saves two weeks shutdown time but if the furnace is dropped, the consequence will be a gas release and serious fire.
 Would you allow the job to be done?

Use the practical risk assessment technique to evaluate.

**Practical Risk Management
Case Study No. 1 Analysis**

| Hazard | Probability | Consequence | Risk Level | Risk Reduction by: | Residual Risk |
|---|-------------|-------------|------------|--|---------------|
| Crane Falls | C | 1 | High | Check previous inspections, conduct inspection immediately prior to | Intermediat |
| Crane over- | C | 1 | High | Perform rigging study (review study) | Intermediat |
| Lifting frame | C | 1 | High | Review lifting capacity of conduct/review rigging | Intermediat |
| Crane | C | 1 | High | Check underground and soil load capability | Intermediat |
| Crane driver | B | 1 | High | Verify certificate of competence; specialised contractor; require use of experienced driver; conduct own test competence including understanding rigging/risks | Intermediat |
| LPG line isolation valves not | B | 1 | High | Identify valves and position personnel immediately isolate in case of a | Low |
| Vapour dispersion equipment not available such that release | B | 1 | High | Preposition vapour dispersion equipment the | Low |
| Overall Residual Risk | | | | | Intermediat |
| Presence of LPG and potential for a | C | 1 | High | Isolate and depressure the LPG | Low |
| Overall Residual Risk | | | | | Low |

Overall conclusion :

**Practical means to achieve a low residual risk is to isolate and depressure the line.
Would allow the work to proceed on that basis.**

3.3 TANK DIPPING RISK ASSESSMENT

| TANK DIPPING / TEMPERATURE SAMPLING | | | | |
|-------------------------------------|---|--|--|----------------------------|
| REF. NO. | HAZARD AND POSSIBLE EFFECTS | EXISTING CONTROLS | ADDITIONAL CONTROLS | RESIDUAL RISK IS TOLERABLE |
| 1 | Slip / trip hazards on stairs and tank top, may result in serious injury. Also dropped objects can possibly cause serious injury. | a) The area shall be kept clean and tidy (good housekeeping). b) Equipment bags (to leave hands free) are to be used and should be secure, with no rips or tears - (to guard against falling objects) . c) Non-slip safety footwear is to be used. | Include in inspection tours | YES YES YES |
| 2 | Accumulation of static electrical charge could cause fire / explosion. | a) Earth bonding strips should be secure. b) Gauger shall remove gloves and touch steel stairway rail platform or tank shell to ensure body is grounded. c) 30 minutes waiting time is required after filling or circulation (unless floating roof tanks, if the roof is floating). NB: Waiting is not required if completely non-conductive hand gauging or sampling devices are used, or when a conductive hand gauging device is completely confined within a pipe, gauging well (for other cage) which is bonded to the tank shell. | Regular testing of bonding. Procedure to be developed for these operations. Toolbox talk material to be developed. | YES YES YES |
| 3 | Oxygen / flammable vapour mixture may cause fire / explosion. | d) Cotton or manilla cords are to be used for lowering sampling containers or thermometers. Not synthetic fibre cords. e) Weight / rule is to be contacted against dip hatch and metal diptapes or rods are kept in contact with metal rim of dip hatch while dipping. f) Do not dip, take temperature or sample whilst filling tank | | YES YES YES |
| 4 | Weather conditions (ie electrical storms) may cause electrocution . Heavy Rain may increase slipping hazards, causing injury. | a) Only open one dip hatch at a time, ie reduce free circulation of air. a) Do not dip tanks during electrical storms. b) Where possible do not dip tanks during heavy rainstorms. | | YES YES |

| TANK DIPPING / TEMPERATURE SAMPLING (CONT) | | | | |
|--|---|--|---|---|
| REF. NO. | HAZARD AND POSSIBLE EFFECTS | EXISTING CONTROLS | ADDITIONAL CONTROLS | |
| | | | RESIDUAL RISK IS TOLERABLE | |
| 5 | General fire hazard from ignition sources. | <ul style="list-style-type: none"> a) No matches or other forms of ignition source are allowed in controlled areas. b) All battery powered appliances (radio communications systems, pagers, telephones, torches, etc) are to be intrinsically safe. c) All electrical installations (eg tank top and bund lighting) are to be fire proof | <ul style="list-style-type: none"> Include in induction training . Regular maintenance. | <ul style="list-style-type: none"> YES YES YES |
| 6 | Skin exposure to petroleum product, ullage and water paste could cause dermatitis. | <ul style="list-style-type: none"> a) The following items of protective clothing to be worn: <ul style="list-style-type: none"> * protective overalls * PVC gloves * barrier creams | | YES |
| 7 | Exposure to high concentrations of vapour when opening tank under pressure could cause dizziness and long term effects. | <ul style="list-style-type: none"> a) Open hatch slowly by use of foot control to allow controlled release of pressure (preventing sudden release of vapour). b) Wear appropriate respiratory mask for hydrocarbons (selected by industrial hygienist). c) Wear goggles to prevent any effect on the eyes. | <ul style="list-style-type: none"> Training in safe tank dipping procedures and PPE. | <ul style="list-style-type: none"> YES YES YES |

3.4 SUPERVISE FUEL DELIVERY AT RETAIL SITE RISK ASSESSMENT

| | | | |
|---|--|--|--|
| JOB No: 01 | | JOB TITLE: Supervise Bulk Fuel Deliveries | |
| JOB HAZARD EXPOSURE: <input type="checkbox"/> Removal of manhole covers <input type="checkbox"/> Removal of padlock and opening tank filler caps <input type="checkbox"/> Connected hoses <input type="checkbox"/> Leak of fuel during delivery | POSSIBLE HAZARDS AND EFFECTS: <input type="checkbox"/> Manual Handling <input type="checkbox"/> Inhalation or skin irritation from contact with fuels <input type="checkbox"/> Slips, trips and falls due to hoses <input type="checkbox"/> Fire or environmental damage from leak or spill | | |
| PERSONS POTENTIALLY EXPOSED: <input type="checkbox"/> all staff <input type="checkbox"/> staff member performing job only <input type="checkbox"/> contractors | | | |
| <input type="checkbox"/> members of the public <input type="checkbox"/> visitors | | | |
| DURATION: mins <input type="checkbox"/> mins <input type="checkbox"/> 30 mins <input type="checkbox"/> 1 hour or more <input type="checkbox"/> FREQUENCY OF JOB: no. of times per day <input type="checkbox"/> week <input type="checkbox"/> month <input type="checkbox"/> year <input type="checkbox"/> | | | |
| CONTROLS USED: MANUAL HANDLING <input type="checkbox"/> staff involved are trained <input type="checkbox"/> lifting rod is used to prevent bending and gives maximum leverage <input type="checkbox"/> pregnant workers are not permitted to do this job SLIPS, TRIPS & FALLS <input type="checkbox"/> hoses are connected such that they do not present a trip hazard <input type="checkbox"/> the area in the forecourt being cleaned is cordoned off from the public <input type="checkbox"/> site is closed to the public whilst delivery takes place <input type="checkbox"/> Other, please state below: | | | |
| PERSONAL PROTECTIVE EQUIPMENT <input type="checkbox"/> nitrile rubber chemically resistant gloves to be worn <input type="checkbox"/> overalls uniform to be worn <input type="checkbox"/> safety shoes to be worn <input type="checkbox"/> Other, please state below: | | | |
| HAZARDOUS SUBSTANCES Indicate substances delivered <input type="checkbox"/> unleaded gasoline <input type="checkbox"/> leaded gasoline <input type="checkbox"/> diesel <input type="checkbox"/> super unleaded <input type="checkbox"/> others (please state): | | | |
| <input type="checkbox"/> all material safety data sheets are available with emergency actions detailed <input type="checkbox"/> general exposure monitoring of this job type has been done - see information sheet <input type="checkbox"/> Other, please state below: | | | |
| EMERGENCY <input type="checkbox"/> interceptor is provided for large spills <input type="checkbox"/> special spill kit or sand bucket is provided for small spills <input type="checkbox"/> fire and explosion evaluation has been done according to HS(G) 146 and the outcome is incorporate into written procedures <input type="checkbox"/> 'competent person' training has been received by all staff involved in this job <input type="checkbox"/> fire on the forecourt video has been shown to all staff <input type="checkbox"/> Delivery Safety and Security Procedures posted in a prominent position <input type="checkbox"/> Other, please state below: | | | |
| ARE THESE CONTROLS ADEQUATE *YES / NO; <i>*if no is indicated then state additional controls needed</i> | | | |
| FURTHER CONTROLS NEEDED: | | | |
| ASSESSMENT COMPLETED BY: | | DATE: | |

HOW TO COMPLETE THIS FORM

HAZARD EXPOSURE:

The main job steps which have associated hazard are detailed here. Indicate in the appropriate box which job steps you do on your site - it maybe that one or more are not applicable.

POSSIBLE HAZARDS AND EFFECTS:

This section states the main hazards associated with the appropriate job step (above). Again indicate in the appropriate box which hazards and effects are applicable on your site.

PERSONS POTENTIALLY EXPOSED:

Indicate the most likely group of people to be exposed to the hazard.

DURATION:

An approximate indication of the duration of the job being assessed should be detailed here using the options available.

FREQUENCY OF JOB:

An approximate indication of the frequency of the job being assessed should be detailed here.

CONTROLS USED:

This section should contain information of the controls which are in place at the time of the assessment. If you have a control measure in place which is not listed specifically then give details of this in one of the 'other' sections as appropriate.

ARE THESE CONTROLS ADEQUATE:

You should evaluate whether the controls which are currently used are adequate. To do this you may like to consider the following:

- ✓ HAS ANYONE BEEN INJURED WHILST DOING THIS JOB - CHECK THE ACCIDENT BOOK?
- ✓ DO YOU THINK THAT IT IS REASONABLY POSSIBLE FOR SOMEONE TO BE INJURED WHILST THIS JOB IS BEING DONE?
- ✓ HAS THIS JOB CAUSED SOMEONE TO BE INJURED AT ANOTHER SERVICE STATION - ASK YOUR AREA OR OPERATIONS MANAGER?
- ✓ DOES ANOTHER PERSON (PREFERABLY THE PERSON PERFORMING THE JOB - IF IT IS NOT YOU) AGREE WITH YOUR ASSESSMENT OF THE POSSIBILITY FOR INJURY?

After considering these question you should decide whether the controls are adequate and indicate this by circling the appropriate answer ie YES or NO.

FURTHER CONTROLS NEEDED:

If you have indicated above that the current controls are not adequate then you should indicate some further controls which are necessary.

Also if you have controls in place which are not fully implemented - for example not all relevant personnel are currently trained in manual handling, then this should also be detailed here. Finally sign and date the assessment, then list all further controls as actions to be completed and followed up using the same procedure as actions from the six monthly checklist.

IF YOU HAVE ANY PROBLEM WITH COMPLETING ANY OF THE STANDARD ASSESSMENTS OR HAVE ANY JOBS IN ADDITION TO THESE - THEN CONTACT YOUR AREA OR OPERATIONS MANAGER FOR ASSISTANCE.

3.5 SPECIMEN HAZARD IDENTIFICATION AND RISK ASSESSMENT

| METHOD STATEMENT REF. | WORK AREA: <i>Switchroom / Gas Compression</i> | | | | OVERALL WORKSCOPE: | | | <i>Remove & Replace Contactor in HVAC Electrical Panel</i> | |
|---|--|---|--|---|---|--|--|--|--|
| | HAZARDS | HAZARD EFFECTS | CONTROL MEASURES AVAILABLE | ASSESSMENT OF RESIDUAL RISKS | REDUCE TO TOLERABLE BY ... | POSITION RESP. FOR ACTION | | | |
| Authorised Person Electrical (APE) removes contactor from HVAC electrical panel (non-hazardous area). | Live electric | Personal injury | Use electrical isolation procedure. | Tolerable | | | | | |
| Electric isolation of HVAC electrical panel. | Shutdown the HVAC fans in gas compression. Loss of circulation and possible build up of gas / fumes. | Fire / explosion and injury to personnel. | Maintain HVAC running by local isolation within control panel. | Tolerable | | | | | |
| Local isolation of contactor within panel to maintain HVAC running state | Live electric (440V) in close proximity to contactor. | Personal injury and damage to equipment. | Electrical isolation procedure. | Unacceptable risk of electrocution. | Electrical isolation of HVAC electrical panel. | Toolpusher / Authorised person | | | |
| Electrical isolation of HVAC electrical panel. | Shutdown of HVAC fans in gas compression, loss of circulation and build up of gas / fumes. | Injury to personnel and fire / explosion. | Suspend all work in area. Fixed fire and gas detection. | Unacceptable. Build up of fumes and gas may set off fire and gas detection. | Sweep area prior to isolation. Inhibit the fixed F & G detection system. Continuous gas monitoring with alternative action plan. Plant to be shutdown on any confirmed gas reports. | Responsible person / safety supervisor | | | |
| All further tasks are tolerable. | | | | | | | | | |

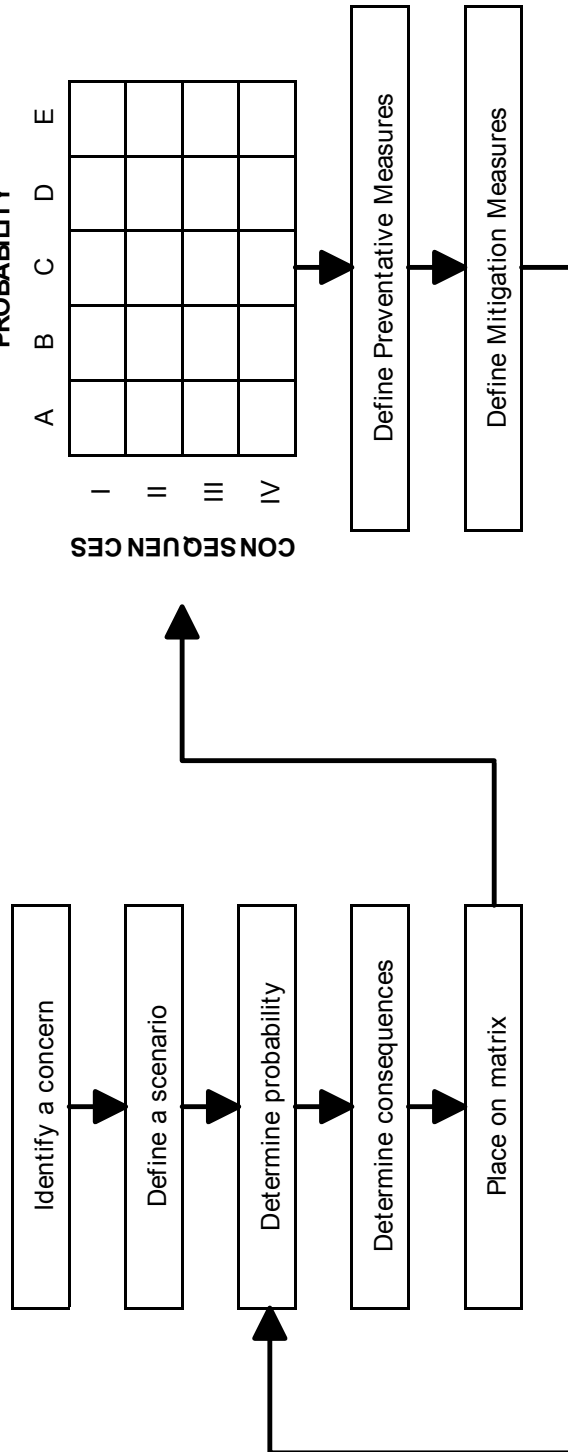
CAN THE WORK NOW PROCEED IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED ABOVE?

NAME: _____ SIGNED: _____ DATE: _____

APPENDIX 4: EXAMPLES OF RISK MATRIX METHODS

4.1 EXAMPLE 1

Risk Matrix Process



RISK MATRIX

| | PROBABILITY | | | | |
|-----|-------------|---|---|---|---|
| | A | B | C | D | E |
| I | | | | | |
| II | | | | | |
| III | | | | | |
| IV | | | | | |

C O N S E Q U E N C E S

| PROBABILITY CATEGORY | DEFINITION (1) |
|----------------------|-----------------------------------|
| A | Possibility of repeated incidents |
| B | Possibility of isolated incidents |
| C | Possibility of occurring sometime |
| D | Not likely to occur |
| E | Practically impossible |

| CONSEQUENCE CATEGORY | CONSIDERATIONS | | |
|----------------------|---|-------------------|--|
| | HEALTH / SAFETY | PUBLIC DISRUPTION | ENVIRONMENTAL IMPACT |
| I | Fatalities Serious Impact on Public | Large Community | Major/Extended Duration Full Scale Response |
| II | Serious Injury to Personnel Limited Impact on Public | Small Community | Serious Significant Resource Commitment |
| III | Medical Treatment for Personnel No Impact on Public | Minor | Moderate Limited Response of Short Duration |
| IV | Minor Impact on Personnel | Minimal to None | Minor Little or No Response Needed |

(1) To extent possible, estimates of Probability and Consequences should be derived from experience during life cycle of similar operations. Industry experience should be considered when limited experience is available.

Risk Assessment Worksheet

Hypothetical Scenario: _____

| CONSEQUENCES | PROBABILITY | | | | |
|--------------|-------------|---|---|---|---|
| | A | B | C | D | E |
| I | | | | | |
| II | | | | | |
| III | | | | | |
| IV | | | | | |

Probability: _____
 Consequences: _____ Health/Safety _____ Public Disruption _____ Environmental Impact _____ Financial Impact _____

Alternative Procedure to Avoid This Operation: _____

Potential Preventative Measures: _____

Potential Mitigation Measures: _____

Modified Probability: _____ Modified Consequences: _____

4.2 RISK MATRIX - EXAMPLE 2

Risk Matrix

Where do we operate?

| Consequence of the Incident | | | | | | Increasing Probability | | | | |
|-----------------------------|---------------------|------------------|----------------|---------------------|-----------------------------|-------------------------------------|--------------------------------------|---------------------------------------|--|---|
| | | | | | | A | B | C | D | E |
| Rating | People | Assets | Environment | Reputation | Never heard of in the world | Heard of incident in industry | Incident has occurred in our company | Happens several times per year in Co. | Happens several times per year at site | |
| 0 | No injury | No damage | No damage | No impact | No impact | | | | | |
| 1 | Slight injury | Slight damage | Slight Effect | Slight Effect | Slight Effect | Improve through Procedures | | | | |
| 2 | Minor injury | Minor damage | Minor leak | Limited impact | Limited impact | | | | | |
| 3 | Major injury | Local damage | Localised leak | Considerable impact | Considerable impact | Incorporate Risk Reduction Measures | | | | |
| 4 | Single fatality | Major damage | Major leak | Major impact | Major impact | | | | | |
| 5 | Multiple fatalities | Extensive damage | Massive leak | Major international | Major international | <i>intolerable</i> | | | | |

4.3 RISK ASSESSMENT CRITERIA

Risk Assessment Criteria

All activities carried out on the premises shall be conducted such that the worst possible outcome of any accident will be in accordance with the right hand shaded columns of the following table.

All identified hazards and residual risks remaining after risk control measures have been identified must be within this tolerable category. Where this acceptable category cannot be achieved, then further risk control measures must be employed. Should the tolerable category remain unachieved, further guidance must be sought before work may commence.

| | | PEOPLE | | | ENVIRONMENT | | ASSETS | |
|---|---|---|--|---|-------------|--|--------|--|
| FATALITIES | | SERIOUS / MULTIPLE INJURIES | MEDICAL OR LOST TIME ACCIDENT | MINOR INJURIES (FIRST AID) | | | | |
| TOTAL LOSS OF CONTAINMENT, WELL PIPELINE LOSS | UNPLANNED RELEASE OF UP TO 186 BARRELS OF LIQUID HYDROCARBONS | UNPLANNED RELEASE OF 5 BARRELS OF LIQUID HYDROCARBONS GAS RELEASE FIRE POTENTIAL EXPLOSION | UNPLANNED RELEASE OF 1 BARREL OF LIQUID HYDROCARBON SMALL SCALE EMISSION OF FLAMMABLE / TOXIC GAS POTENTIAL FIRE | NO. UNPLANNED OR UNCONTROLLED RELEASE OF HYDROCARBON INVENTORY UNPLANNED EMISSION NON TOXIC, NON FLAMMABLE NON CORROSIVE, NON HAZARDOUS SUBSTANCES PERMISSIBLE | | | | |
| | MAJOR GAS RELEASE FIRE EXPLOSION | | | | | | | |
| TOTAL LOSS OF ASSET | EQUIPMENT DAMAGE TO \$500,000 | EQUIPMENT DAMAGE TO \$50,000 | MINOR EQUIPMENT DAMAGE - UP TO \$10,000 | | | | | |
| PLANT OUT OF ACTION INDEFINITELY | PLANT DOWNTIME - 1 DAY OR MORE | NOMINAL DOWNTIME - UP TO 1 HOUR | NO DOWNTIME | | | | | |

APPENDIX 5: UK GUIDANCE ON TASK RISK ASSESSMENT

The following four pages are a copy of the leaflet “Five Steps to Risk Assessment”⁹ published by the UK Health and Safety Executive and is reproduced with their permission.

FIVE STEPS TO RISK ASSESSMENT

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do

1 This leaflet is intended to help employers and self-employed people to assess risks in the workplace. It is aimed at firms in the commercial, service and light industrial sectors.

2 An assessment of risk is nothing more than a careful examination of what, in your work, could cause harm to people, so that you can weigh up whether you have taken enough precautions or should do more to prevent harm. The aim is to make sure that no one gets hurt or becomes ill. Accidents and ill health can ruin lives, and affect your business too if output is lost, machinery is damaged, insurance costs increase, or you have to go to court.

3 Don't be put off by some of the words used in this guide.

- 'Hazard' means anything that can cause harm (eg chemicals, electricity, working from ladders, etc);
- 'Risk' is the chance, great or small, that someone will be harmed by the hazard

Step 1 Look for the hazards

7 If you are doing the assessment yourself, walk around your workplace and look afresh at what could reasonably be expected to cause harm. Ignore the trivial and concentrate only on significant hazards which could result in serious harm or affect several people. Ask your employees or their representatives what they think. They may have noticed things which are not immediately obvious. Manufacturers' instructions or datasheets can also help you spot hazards and put risks in their true perspective. So can accidents and ill-health records.

Step 2 Decide who might be harmed, and how

8 Think about people who may not be in the workplace all the time, eg cleaners, visitors, contractors, maintenance personnel, etc. Include members of the public, or people you share your workplace with, if there is a chance they could be hurt by your activities.

Step 3 Evaluate the risks arising from the hazards and decide whether existing precautions are adequate or more should be done

9 Even after all precautions have been taken, usually some risk remains. What you have to decide for each significant hazard is whether this remaining risk is high, medium or low. First, ask yourself whether you have done all the things that the law says you have got to do. For example, there are legal requirements on prevention of access to dangerous parts of machinery. Then ask yourself whether generally accepted industry standards are in place. But don't stop there - think for yourself, because the law also says that you must do what is reasonably practicable to keep your workplace safe. Your real aim is to make all risks small by adding to your precautions if

necessary. More information about legal requirements and standards can be found in the HSE publications Management of Health and Safety at Work: Approved Code of Practice and Essentials of Health and Safety, details of which are given at the end of this leaflet.

10 Improving health and safety need not cost a lot. For instance, placing a mirror on a dangerous blind corner to help prevent vehicle accidents, or putting some non-slip material on slippery steps, are inexpensive precautions considering the risks.

11 If you find that something needs to be done, ask yourself:

- (a) Can I get rid of the hazard altogether?
 - (b) If not, how can I control the risks so that harm is unlikely?
- Only use personal protective equipment when there is nothing else that you can reasonably do.

12 If the work you do tends to vary a lot, or if you or your employees move from one site to another, select those hazards which you can reasonably foresee and assess the risks from them.

After that, if you spot any unusual hazard when you get to a site, get information from others on site, and take what action seems necessary.

13 If you share a workplace, tell the other employers and self-employed people there about any risks your work could cause them, and what precautions you are taking. Also, think about the risks to your workforce from those who share your workplace.

Step 4 Record your findings

14 If you have fewer than five employees you do not need to write anything down, but if you have five or more employees you must record the significant findings of your assessment. This means (1) writing down the more significant hazards and (2) recording your most important conclusions - for example, "Electrical installations: insulation and earthing checked and found sound", or "Fume from welding: local exhaust ventilation provided and regularly checked". You must also inform your employees about your findings.

15 There is no need to show how you did your assessment, provided you can show that:

4 The important things you need to decide are whether a hazard is significant, and whether you have it covered by satisfactory precautions so that the risk is small. You need to check this when you assess the risks. For instance, electricity can kill but the risk of it doing so in an office environment is remote, provided that 'live' components are insulated and metal casings properly earthed.

How to assess the risks in the workplace

5 Don't be overcomplicated. In most firms in the commercial service and light industrial sector, the hazards are few and simple. Checking them is commonsense, but necessary. You may have already assessed some of them - for example, if you use toxic or dangerous chemicals, you should already have made an assessment of the risks to health and precautions you need to take under the Control of Substances Hazardous to Health Regulations (COSHH). If so, you can

- a proper check was made;
- you asked **who** might be affected;
- you dealt with all the obvious significant hazards, taking into account the **number** of people who could be involved;
- the precautions are reasonable, and the remaining risk is low.

Assessments need to be suitable and sufficient, not perfect. The real points are:

- **Are the precautions reasonable, and**
- **Is there something to show that a proper check was made?**

16 Keep the written document for future reference or use; it can help you if an inspector questions your precautions, or if you become involved in any action for civil liability. It can also remind you to keep an eye on particular matters. And it helps to show that you have done what the law requires. There is a form with this guide which you may find helpful but, by all means, produce your own form if it suits you better.

17 To make things simpler, you can refer to other documents, such as manuals, the arrangements in your health and safety policy statement, company rules, manufacturers' instructions, and your health and safety procedures. These may already list hazards and precautions. You don't need to repeat all that, and it is up to you whether you combine all the documents, or keep them separately.

Step 5 Review your assessment from time to time and revise it if necessary

18 Sooner or later you will bring in new machines, substances and procedures which could lead to new hazards. If there is any significant change, you should add to the assessment to take account of the new hazard. In any case, it is good practice to review your assessment from time to time. Don't amend your assessment for every trivial change, or still more, for each new job, but if a new job introduces significant new hazards of its own, you will want to consider them in their own right and do whatever you need to keep the risks down.

consider them 'checked', and write that down if you are making a written assessment. For other hazards, you probably already know whether you have machinery that could cause harm, or if there is an awkward entrance or stair where someone could be hurt. If so, check that you have taken what reasonable precautions you can to avoid injury.

6 If you are a small firm and you are confident you understand the work, you can do the assessment yourself. If you are a larger firm, you could ask a responsible employee, safety representative or safety officer to help you. If you are not confident, get help from a competent source (see paragraph 19). But remember - you are responsible for seeing it is adequately done.

Getting help

19 It is a legal requirement to assess risks. In the unlikely event that you get stuck on the assessment, your local health and safety inspector can advise you on what to do. You will find most of what you need to know about legal requirements and standards in:

Essentials of Health and Safety at Work |
SBN 0 7176 0716 X, £5.95

but you might also find the following useful:

Management of Health and Safety at Work: Approved Code of Practice, L21, 1992, price £5.00, ISBN 0 7176 0412 8

Writing your health and safety policy statement, 1989 (rev), price £3.00, ISBN 0 7176 0424 1

COSHH: A brief guide for employers, IND(G)136(L), 1993, free

Getting to grips with manual handling: a short guide for employers, IND(G)143(L), 1993, free

Personal Protective Equipment at Work: Guidance on Regulations, L25, 1992, price £5.00, ISBN 0 7176 0415 2

Display Screen Equipment Work: Guidance on Regulations, L26, 1992, price £5.00, ISBN 0 7176 0410 1

Guide to Risk Assessment Requirements - Common Provisions under Health & Safety Law, IND(G)221(L)

Whose risk is it anyway? (video) (includes audio tape and literature) available from CFL Vision, PO Box 35, Wetherby, West Yorkshire, LS23 7EX, 1992, price £12.98 while stocks last

The publications listed above (except the video) may be obtained by mail order from:
HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS
Tel: 01787 881165 Fax: 01787 313995

HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 0541 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ

This leaflet is available in priced packs of 10 from HSE Books, ISBN 0 7176 0904 9. Single free copies are also available from HSE Books.

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ASSESSMENT OF RISK FOR

Company Name

Company Address

HAZARD

Look only for hazards which you could reasonably expect to result in significant harm under the conditions in your workplace. Use the following examples as a guide:-

- Slipping/tripping hazards (eg poorly maintained floors or stairs)
- Fire (eg from flammable materials)
- Chemicals (eg Battery Acid)
- Moving parts of machinery (eg blades)
- Work at height (eg from mezzanine floors)
- Ejection of material (eg from plastic moulding)
- Pressure systems (eg steam boilers)
- Vehicles (eg fork-lift trucks)
- Electricity (eg poor wiring)
- Dust (eg from grinding)
- Fume (eg welding)
- Manual handling
- Noise
- Poor lighting
- Low temperature

WHO MIGHT BE HARMED?

There is no need to list individuals by name--just think about groups of people doing similar work or who may be affected, eg:-

- Office staff
- Maintenance personnel
- Contractors
- People sharing your workplace
- Operators
- Cleaners
- Members of the public

Pay particular attention to:-

- Staff with disabilities
- Visitors
- Inexperienced staff
- Lone workers

They may be more vulnerable

List hazards here:

List groups of people who are especially at risk from the significant hazards which you have identified:

| | |
|-----------|------------------------------|
| _____ | Assessment undertaken (date) |
| _____ | Signed _____ |
| Post Code | Date _____ |
| _____ | Assessment Review Date _____ |

IS THE RISK ADEQUATELY CONTROLLED?

Have you already taken precautions against the risks from the hazards you listed? For example, have you provided:-

- Adequate information, instruction or training?
- Adequate systems or procedures?

Do the precautions:-

- Meet the standards set by a legal requirement?
- Comply with a recognised industry standard?
- Represent good practice?
- Reduce risk as far as reasonably practicable?

If so, then the risks are adequately controlled, but you need to indicate the precautions you have in place. You may refer to procedures, manuals, company rules, etc giving this information.

WHAT FURTHER ACTION IS NECESSARY TO CONTROL THE RISK?

What more could you reasonably do for those risks which you found were not adequately controlled?

You will need to give priority to those risks which affect large numbers of people and/or could result in serious harm. Apply the principles below when taking further action, if possible in the following order:-

- Remove the risk completely
- Try a less risky option
- Prevent access to the hazard (eg by guarding)
- Organise work to reduce exposure to the hazard
- Issue personal protective equipment
- Provide welfare facilities (eg washing facilities for removal of contamination and first-aid)

List hazards here:

List the risks which are not adequately controlled and the action you will take where it is reasonably practicable to do more. You are entitled to take cost into account, unless the risk is high: