TARONG ENERGY CORPORATION LIMITED

OCCUPATIONAL HEALTH & SAFETY PROCEDURE FOR

FALL INJURY PREVENTION SYSTEM

OHS-PROC-102

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OWNED BY:	APPROVED BY:	DATE:.....
NAME: M. Barry	NAME: J.Judge	
QA CHECK BY:	CONTENTS CHECK BY:	
NAME: C Bay	(incl. HSE Needs)NAME: M Joy	

1. Purpose:

The objective of this procedure is to:

- Describe the requirements for the use of fall injury prevention systems for all persons working at Tarong Energy Corporation sites;
- To minimise the risk of an incident involving a fall from height when using fall injury prevention systems: and
- Reduce the potential consequence if such an event were to occur.

2. Scope:

This procedure shall apply to all Tarong Energy employees, visitors and contractors and their employees

3. Procedure:

Tarong Energy requires that the hierarchy of controls be implemented where a person is at risk of sustaining a fall from height.

The suite of working at heights procedures provides guidance on the different options available. Where other methods are not practical, fall injury prevention systems may be required.

Fall Injury Prevention System means a system designed to control/prevent a person's fall from one level to another and also minimise the risk of injuries or harm during the fall.

Fall injury prevention systems (FIPS) include:

- Restraint systems;
- Edge protection
- Fall – arrest systems;
- Catch platforms;
- Scaffolding *(As per OHS-PROC-105);*
- Safety nets; and
- Safety mesh. (Parts fall protection)

A fall injury prevention system shall be used where a person could fall (two metres or more; risk assess if under two metres) at a TEC workplace, unless edge protection complying with the *Workplace Health & Safety Regulation 1997: S216 'Edge Protection as a control measure'* is present.

Key Points for the use of Fall Injury Prevention Systems:

- Choosing the most appropriate fall injury prevention system is essential;
- The correct selection, installation and use of equipment is critical to their effectiveness when arresting a fall;
- The fall injury prevention system and the anchorages must be designed, manufactured, constructed, selected or installed so as to be capable of with

standing the force applied to them as a result of a person's fall and comply with the AS/NZS1891 series of Australian Standards and the manufactures recommendations;

- Fall injury prevention systems should be such that a person is prevented from falling; if this is not possible; the person travels the shortest possible distance before having the fall arrested;
- Ensuring the lanyard and harness are connected to the fall injury prevention system is critical (rather than just wearing the equipment); and
- Fall-arrest equipment must be removed from service and not used after it has arrested a fall until it has been inspected and certified as operational by a competent person.

3.1. Travel Restraint systems

A restraint system comprises:

- Anchorage point(s) of suitable strength;
- A static line or restraint line of appropriate strength and length so that a person cannot get into a position where they could fall off an edge of a surface or through a surface; and
- A full body harness (Note: restraint belts are not permitted on TEC sites).

Its purpose is to limit horizontal movements from an anchorage point or a horizontal life line or life rail so that the user is totally restrained from reaching a position where either a free fall or limited free fall is possible.

A restraint system is suitable for use where:

- The user can maintain secure footing without having to tension the restraint line and without the aid of any other hand hold or lateral support. When deciding whether secure footing can be maintained, consider:
    - The slope of the surface;
    - The supporting material type; and
    - The surface texture of the surface and whether it is likely to be wet, oily or otherwise slippery;
- The static lines are fitted with a shock absorber when required by the manufacturer; and
- The restraint system conforms with the Australian/New Zealand Standard, *AS/NZS 1891* series.

Note: A fall-arrest system should be used instead of a restraint system if any of the following situations apply:

- The user can reach a position where a fall is possible;
- The user has a restraint line that can be adjusted in length so that a free fall position can be reached;
- There is a danger of the user falling through the surface (e.g. roofing material);
- The slope is over 15^{o}; or
- There is any other reasonably likely misuse of the system which could lead to a free fall.

3.2. Fall arrest equipment

Working in a 'fall arrest' position is the least preferred use of fall protective equipment. Avoiding fall arrest situations is preferred by adopting fall restraint or work positioning (by trained personnel) equipment and methods.

If work must be performed in a 'fall arrest' situation the following minimum points apply:

- A fall arrest harness and lanyard, fitted with an energy shock absorption device, shall be used l.
- The lanyard assembly shall have a working slack length appropriate to the working height. The maximum free fall distance is two metres.
- Connection to a suitable anchor point and the length/ type of lanyard chosen shall be such to minimise the vertical free fall distance to an absolute minimum. Aim for a limited free fall – i.e. the equipment and methods used limit the vertical free fall distance to less than 600mm. Limiting the vertical fall distance, limits the severity of the fall.
- The optimum anchor position is above the head. Where an inertia reel system is used it should be directly connected to the harness, with a limit of operation of a 30 degree radius unless otherwise specified by the manufacturer.
- All harnesses used on TEC sites must be a full body harness and comply with Australian Standards;
- Where hot work is to be conducted in or around the area where personal fall arrest systems are in use, controls shall be implemented to protect the equipment against damage from sparks and heat.

3.3. Catch Platforms, Safety nets & Safety mesh

- Catch platforms, safety nets and safety mesh shall only be used after completion of a detailed risk assessment. Other more permanent means of control (e.g. fixed work platforms, scaffolding, EWPs) shall be considered before such methods are utilised.
- The use of catch platforms, safety nets and safety mesh shall be in accordance with relevant Australian Standards and the *Workplace Health & Safety Regulation 1997, Part 17.* The West Australian Commission for Occupational Safety & Health *'Code of Practice –Prevention of Falls at Workplaces 2004'* can also be used a guide/ reference material.

3.4. Industrial Rope Access Systems:

- Industrial rope access systems are used for gaining access to difficult to reach areas. A detailed risk assessment shall be performed to utilise industrial rope access systems.

- The use of industrial rope access systems shall be in accordance with AS/NZS4488.
- Only competent persons shall utilise industrial rope access systems.

3.5. Anchorage points:

An anchor point selected and used in the fall injury prevention system shall be designed, rated and capable of withstanding the forces imposed. The TEC work at height training shall provide personnel with skills in selection, use and inspection of anchor points. The mode of use will determine the minimum strength requirements but these shall be exceeded wherever possible.

The following requirements shall be adhered to:

Type of Fall	Description	Anchor Point Strength
Restrained Fall / Total Restraint	Limited to any situation where the person suffering the fall is partially restrained by a restraining device such as a pole strap, or is sliding down a slope on which it is normally possible to walk without the assistance of a handrail or hand line, and not possible of falling over a vertical edge.	**6kN**
Limited Free Fall	Limited to any situation where there is no risk in which the distance a person using the fall arrest harness system is likely to fall vertically before the system start to take loading is not more than 600mmm.	**12kN**
Free Fall Single Person	Single point anchor in which the distance a person using the fall arrest harness system could fall vertically before the system starts to take loading is more than 600mm but not more than 2m.	**15kN**
Free Fall Two Persons	Two person anchor point in which the distance a person using the fall arrest harness system could fall vertically before the system starts to take loading is more than 600mm but not more than 2m.	**21kN**

Note: Permanent fall arrest/restraint anchorage points shall be inspected at intervals not exceeding 12 months, with consideration to the location, modes of use, and environmental conditions. Permanent anchor points shall comply with AS1891.4

Anchor loading requirements for use with static lines (e.g. horizontal cables) is usually substantially higher than those used for personal fall arrest equipment. Hence all anchorage point designs for static lines shall be approved by a Registered Professional Engineer in accordance AS1891.2 and installed / inspected by a trained and competent person.

3.6. Fall clearances:

When using personal fall arrest equipment in free fall mode (> 600 mm and less than 2m under the influence of gravity) the clearance distance shall be adequate to ensure the person falling does not strike the ground or an obstacle. The clearance distance required when using fall arrest systems shall be calculated prior to commencing work and take into account the distance that a shock absorbing lanyard can deploy. Refer to Appendix 1 for an example of calculating fall distance.

3.7. Compatibility of equipment:

All fall arrest equipment used shall comprise of items that are compatible with one another at both ends. Refer to AS/NZS 1891.4 – 2000.

Attachment hardware (lanyard hooks, carabineers etc) shall consist of double action mechanisms as a minimum. Where carabineers are used it is highly preferred that these are triple acting mechanisms. All karabiners shall be rated with a minimum breaking strength of **22kN**.

The persons performing the work at height and their supervisor are expected to assess and choose the correct equipment for the task to be performed including ensuring compatible equipment is used for the specific situation. The JSEA process is to facilitate this, along with the manufacturer's recommendations.

3.8. Inspection:

A person trained and competent in fall protection testing shall formally inspect all personal fall arrest equipment at the following intervals:

Device Type	Inspection Intervals
Personal equipment including harnesses, lanyard	Inspection by operator

assemblies, connectors, fall-arrest devices and common use devices such as ropes, slings, fall-arrest devices, mobile attachment devices, etc	before and after each use
Fall-arrest devices – external check only	3-monthly inspection by competent person
Harnesses, lanyard assemblies and associated personal equipment (including Type 1, 2 & 3 fall arrest devices)	6 monthly (or more frequently if recommended by the manufacturer or supplier)
• Permanent Installations anchor points • Fall-arrest devices – full service including dismantling where indicated • Horizontal lifelines and rails, including integral components and permanently installed mobile attachment devices	12 months (or more frequently if recommended by the manufacturer or supplier)

Where applicable every fourth (4th) inspection of type 2 & 3 fall arrest devices shall be serviced by an authorised service agent.

Each harness shall be identifiable via its equipment serial number and recorded on an equipment register.

All equipment shall have an inspection tag fitted showing date for next inspection.

4. Rescue:

Where fall arrest equipment is used in total free fall arrest mode *(fall of greater than 600mm and less than 2m before the system takes any loading)*, a JSEA shall determine the appropriate level of rescue plans that must be in place prior to the job commencing. Such plans should be completed by the supervisor and the work party and involve consultation with an emergency response team member.

Refer Work at Heights Guide which incorporates the Emergency Response Plan Form T-1100.

5. Responsibilities:

5.1. Manager Operations:

Responsible for ensuring:

- That a safe system of work for the prevention of falls when using fall injury prevention systems in compliance with this procedure is implemented and maintained.
- Personnel's risk of injury is minimised when exposed to hazards arising from working with height when using fall injury prevention systems.
- Competent personnel conducts a JSEA and select appropriate control measures for fall injury prevention systems.

5.2. Coordinators:

Shall ensure that:

- JSEAs are conducted before the commencement of work and at any time the scope of work changes or the risk of a fall or falling object increases the JSEA is amended and re-approved.
- Where practicable, the need to work where there is the risk of a fall or a falling object is eliminated.
- Appropriate control measures are selected using the hierarchy of controls:
  - ✓ Elimination (Most preferred)
  - ✓ Substitution
  - ✓ Redesign
  - ✓ Isolation
  - ✓ Administrative
  - ✓ Personal Protective Equipment (Least preferred).
- All equipment used shall be available as required and fit-for-purpose.
- Before commencing work and at shift changeovers, incoming personnel are made aware of the measures being used for work in progress as per the JSEA.
- All fall injury prevention systems are inspected in accordance with this procedure.
- Personnel using fall injury prevention systems are trained and deemed competent in the use of fall injury prevention systems.

5.3. Supervisors:

Shall ensure that:

- JSEAs are performed to identify hazards, assess the risks and implement appropriate controls.
- All personnel using fall injury prevention systems are trained and competent in the use of fall injury prevention systems prior to use.
- All fall injury prevention systems are selected, used, inspected and stored in accordance with this procedure.

5.4. All persons involved in task:

Shall:

- Participate in a Job Safety & Environmental Analysis (JSEA) and comply with its requirements.
- Ensure they are trained and deemed competent in the use of fall injury prevention systems.
- Inspect all equipment before use in accordance with this procedure to the level of their competence.
- Ensure all equipment has an inspection tag which is within its current inspection date.
- Report and remove from service any fall injury prevention system that is faulty or has been used to arrest a fall.
- Select, use, care and store fall injury prevention systems in accordance with this procedure.

5.5. Contracts Administration and Purchasing:

- Contracts Administrators shall always ensure that all contracts awarded comply fully with the requirements and intent of this procedure.
- All purchasing of working at height equipment or plant shall be approved by the Health and Safety Department to ensure that it complies with this procedure.
- Purchasing personnel shall not change the provisions to prevent falls contained in a purchasing specification, without the consent of the originator of the specification.

6. Training and Competencies:

All persons who are required to use, purchase, supervise, or inspect fall protection equipment shall be trained and competent to an appropriate level for the involvement they have with fall protective equipment.

Before any person commences any work at heights it shall be confirmed that they have the appropriate level of training in the Tarong Energy Corporations suite of Working with Height procedures.

6.1. Records

Training Records – The People Services Department is responsible for managing and maintaining all training records. All hard copy training documentation shall be forwarded to the training department for data entry and filing.

Note: ***Record Keeping shall be in compliance Archival of Records Gov-Proc-07*****.**

7. Statutory and Legal Considerations

- Workplace Health and Safety Act 1995.
- Workplace Health and Safety Regulation (1997).
- As a guide / reference – West Australian Commission for Occuptational Safety & Health ‘Code of Practice ‘ Prevention of Falls at Workplaces 2004’.

8. Health, Safety and Environmental Considerations:

Nil.

9. Definitions:

Catch Platform	A platform designed to provide overhead protection to persons by catching falling objects. Usually constructed of scaffolding components and ply wood.

Catch Protection	A temporary platform/net located below a work area, to 'catch' persons should they slip/fall from the work area.
Competent Person:	A person who has through a combination of training, eduction and experience, acquired knowledge and skills enabling that person to perform correctly a specified task.
EWP	A telescoping device, scissor device, or articulated device, or any combination thereof used to position personnel, equipment and materials at work locations above or below the base support surface.
Fall Arrest Device	A self-locking device whose function is to arrest a fall. Fall arrest devices are classified into three different types. **Type 1:** A fall-arrest device which travels along an anchorage line, locks to the line when loaded and can only be loaded in the direction of the line. (e.g.: A rope grab or carrier sleeve) **Type 2:** A fall-arrest device from which a spring-loaded anchorage line pays out, and which locks when loaded and releases when the load is removed. (e.g. an inertia reel) **Type 3:** A fall-arrest device from which a spring-loaded anchorage line pays out, which locks when loaded, but may be wound back as a winch after loading and locking. (e.g. an inertia reel with a winch handle)
Fall Clearance	The vertical clearance required from the anchor point to the closest obstacle to prevent a person from striking that obstacle in a fall. Must take into account stretch and energy absorber deployment.
FIPS	Fall Injury Prevention Systems
Free Fall / Free Fall-Arrest	Means a fall, or the arrest of a fall, in which the distance a person using the fall-arrest harness system falls vertically before the system starts to take loading is more than 600mm but not more than 2m.
Horizontal Lifelines	A flexible line supported by two or more anchorages with a slope not exceeding 5^0
Industrial Rope Access	The use of industrial rope equipment and techniques to perform work at height.
Lanyard	A line used, to connect a fall arrest harness to an anchorage point in situations where there is a risk of a fall.
Lifeline	A line used to connect a harness to an anchorage point in situations where a free fall can be prevented (e.g.: total restraint). A rope grab may be used on the lifeline.
Limited Free Fall / Limited free fall-arrest	Means a fall, or the arrest of a fall, in which the distance a person using the fall-arrest harness system is likely to fall vertically before the system starts to take loading is not more than 600mm.
PPE	Personnel Protective Equipment
Restrained Fall	Using personal fall arrest equipment to restrain a fall from the full influence of gravity (E.g.: pole strap sliding down a pole) or on a slope on which it is normally possible to walk down without the assistance of a handrail or hand line.

Roof	The upper covering of a building or structure.
RPE	Registered Professional Engineer.
Shall	Indicates that a statement is mandatory.
Should	Indicates a recommendation.
Total Restraint	Using personal fall arrest equipment to prevent a person from reaching a position in which there is a risk of a free or limited free fall.

10. Reference Documentation:

AS/NZS 1576	Scaffolding
AS/NZS 1891.1	Industrial Fall Arrest Systems and Devices - Safety Belts and Harnesses
AS/NZS 1891.2	Industrial Fall Arrest Systems and Devices- Horizontal Lifeline and Rails Systems
AS/NZS 1891.3	Industrial Fall Arrest Systems and Devices- Fall-arrest Devices
AS/NZS 1891.4	Industrial Fall Arrest Systems and Devices- Selection, Use and Maintenance
AS/NZS 4389	Safety Mesh
AS/NZS 4488.2	Industrial Rope Access System
AS/NZS 4576	Guidelines for Scaffolding
BS EN 1263	Safety Nets
Corp-PTW-01	Corporate Permit to Work Manual
Gov-Proc-07	Archival of Records
OHS-PROC-100	Safe Working at Heights
T-1022	Job Safety & Environmental Analysis
T-1100	Work at Heights Guide / Emergency Response plan
T-1276	Ladder Check List

11. Revision History:

Rev No.	Revision. Date:	Revision Description:	Author:	Approved. By:
0	25.01.2007	New Procedure	M. Barry	J. Judge

12. Appendix

12.1. Appendix 1: Calculating your potential fall distance