SAFETY MANAGEMENT AND MITIGATION PLAN

Territory Generation

CONTROLLED DOCUMENT

Document Location	POLICY AND PROCEDURES - SAFETY MANAGEMENT - Policy - Safety Management and Mitigation Plan (SMMP)
HPE RM Controlled No.	CONTROL0087
Status/Version	FINAL 8.0
Published Date	30/7/2020
Review Date	30/7/2021
Document Owner	GM Assets and Operations
Document Sponsor	CEO

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1 INTRODUCTION

1.1 Purpose

The purpose of this *Safety Management and Mitigation Plan* (**SMMP**) is to present to the Utilities Commission detail of Power Generation Corporation's (Territory Generation) approach to safety, relating specifically to its electrical infrastructure. This plan's aim is to demonstrate that Territory Generation meets its workplace health and safety obligations and responsibilities in ensuring the safety of all people who enter Territory Generation sites and work on or near electrical infrastructure; whether they are employees, contractors or visitors. (Note: Territory Generation power station sites have restricted access to members of the public).

1.2 Scope

This document provides information on Territory Generation's safety policies, procedures, systems and strategies relating to our electrical plant and equipment; which are in place to ensure the safety of all persons entering and working on our sites.

This document does not include information on Territory Generation's:

- Approach to workplace health and safety for workers conducting work on plant and equipment not associated with the generation of electricity;
- General business responsibilities relating to the provision of electricity services to people of the Northern Territory.

1.3 Background

Background information on Territory Generation's overall business responsibilities and asset information including the types of generating plant, capacity, availability, output and fuel, can be found in the following references:

- *Territory Generation Statement of Corporate Intent*
- *Territory Generation Annual Reports*
- Territory Generation asset management documentation

These documents can be provided on request.

1.4 Supporting Information

The expression '*good electricity industry practice'* has been agreed between Territory Generation and the UC to mean the elements of the Australian Standard AS 5577 *Electricity Network Safety Management Systems.*

The expression '*around electricity infrastructure'* has been interpreted to mean '*on, near or related to*' when referring to Territory Generation's electricity infrastructure assets.

Documents used as source material in preparing this SMMP are listed in Section 17 under relevant sub sections. These documents can be provided for reference if required.

2 TERRITORY GENERATION

2.1 Safety Management System

Territory Generation is committed to ensuring the health and safety of all employees, contractors and visitors entering and working on its sites. Territory Generation's focus is the promotion of safe behaviours and a positive safety culture in order to achieve a workplace free of accidents and injuries.

This focus is supported by the organisations *Workplace Health and Safety Policy* commitment to ensure that the operation, maintenance and development of its plant, equipment and property, are always conducted with measures taken to remove or reduce risks to our people's health and safety.

Territory Generation's *Safety Management System* (SMS) provides the framework for the management of the health and safety of people, assets and property.

The application of a systematic and cyclic approach to managing safety enables Territory Generation as an organisation to meet its obligations under the NT Work Health and Safety (National Uniform Legislation) Act and Regulations.

Territory Generation's SMS follows five generally-accepted core elements and cycle of continuous improvement introduced in AS 4801 *Occupational Health and Safety Management Systems* and as per the diagram below:

Diagram 1: SMS key elements and continuous improvement cycle

2.2 Safety Culture

a) Territory Generation's *Stop Unsafe Work* policy gives the authority and encourages all persons to take the initiative to stop any work that they consider may be unsafe. This information is communicated through site induction, intranet and internet information.

b) Territory Generation *Safety Non Negotiables* are a set of six key safety rules which have been established as a standard of expected safety behaviour. These key rules target high risk activities, behaviours or processes which have the potential to cause serious injury or fatality if not complied with.

The *Safety Non Negotiables* must be adhered to by **all persons at all times** when entering and working on Territory Generation sites.

Any breach is considered a serious matter and is investigated with appropriate action taken, which may include disciplinary action.

The following six rules apply:

- Everyone has an obligation to stop work that they believe may be unsafe;
- We must always report every incident, near hit and injury;
- Only operate equipment for which you are competent and authorised;
- Never remove another person's Danger Tag or Personal Lock, without written authorisation;
- No person may work if under the influence of alcohol or drugs;
- We must always correctly wear compulsory Personal Protective Equipment (PPE).

c) Territory Generation has a One Hour Rule Guideline for incident reporting to ensure the appropriate level of response to an incident is initiated by escalating levels of communication based on level of risk. This protocol occurs in conjunction with the recording of the incident in My Hub Incident Management System.

2.3 Organisational structure

Diagram 1: Organisational structure in relation to this plan

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                          Territory Generation Board
                                   │
                          Chief Executive Officer
                                   │
   ┌──────────────┬────────────────┼────────────────┬──────────────────┐
General Manager  General Manager   General Manager  General Manager   Company Secretary /
Finance & Corporate Assets &       Commercial       Major Projects    General Counsel
Services         Operations
                    │
         ┌──────────┴──────────┐
   Manager Safety        Manager Assets &
                         Engineering
   Project Manager Safety  CIPS/WPS Station
                           Manager
   Health & Safety         Katherine Lead OMT
   Adviser North
   Health & Safety         Regional Manager South
   Adviser  South
                           OSPS Station Manager
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3 PEOPLE SAFETY

3.1 Employees

a) Site Induction and Orientation

No employee, contractor or visitor may enter a Territory Generation site without a valid induction.

Site induction processes are conducted face to face and comprises the following:

Inductee	General induction	Site specific
Employees & Contractors	General induction delivered in classroom	Site specific induction inclusive of site orientation walk around. For contractors also will include task specific elements.
Visitors	n/a	Site specific induction inclusive of site orientation walk around to the level required. Note: Mandatory for visitors to be escorted at all times on operational sites.

Site maps are used as part of the orientation process to highlight specific aspects of each site including but not limited to: emergency assembly areas, locations of first aid rooms (where applicable) and mandatory safety glasses and safety helmet zones.

A site induction checklist is completed for each inductee (Employee, contractor and visitor) checking off that critical safety information and procedural requirements have been covered with each inductee including but not limited to: minimum dress and PPE requirements, access, emergency response, first aid, communications, Permit to Work, incident reporting and investigation, and fitness for work.

Site induction processes are linked with site security access processes (Honeywell system) to ensure the right level of access is allocated to staff, contractors and visitors accessing a site.

Induction status is recorded in the Training Management System (MyHub TMS).

b) Permit to Work

Territory Generation has a Permit to Work system that sets out the principles and responsibilities for safe access to all equipment, confined spaces and for hot work in high risk areas owned, controlled or operated by Territory Generation.

Permit to Work training is delivered face to face with competency assessments before sign off. Records of authorisation are captured in the Training Management System maintained by the Learning & Development Unit. Training prerequisites are checked prior to approval of authorisation to ensure the person is appropriately qualified and licenced, where applicable; for the work being conducted and the allocated level of authorisation.

The electronic Training Management System provides the ability to record and monitor that all workers have up to date training when working on or near electricity infrastructure.

Territory Generation Permit to Work system has been standardised across all sites*.

- At Channel Island, Weddell and Own Springs Power Stations the Electronic Permit to Work System is operational.

- At the Katherine, Yulara, Kings Canyon and Tennant Creek Power Stations the paper based alternative of the electronic Permit to Work System is operational.

  *Exception - Ron Goodin Power Station continues to utilise the previous Access to Apparatus rules system. This site is supporting Owen Springs Power Station and has not transitioned to the current Permit to Work system.

- The Honeywell site access software is also integrated with the My Hub Training Management System and the electronic permit to work system. Identity cards issued for workers are used for both site access and to swipe-onto the electronic permit to work system, at the sites where this is in operation.

c) *Training*

Territory Generation provides relevant training to ensure our worker's safety. Training provided includes legislative requirements, Induction & Permit requirements and specialised training such as High Voltage Operations.

Legislative training requirements are those surrounding licencing, operating certain equipment, including any supporting courses that may be required that supports the licence, example: Low Voltage Rescue training, or forklift training to obtain a High Risk Licence. These courses are refreshed as per the requirements to ensure that our employees have current skills sets and are delivered by Registered Training Organisations to a National Unit of Competency.

The My Hub Training Management System provides a single database for all employee and contractor training records.

This system enables:

- Employees to view and manage their own training requests and records;

- Supervisors to view their personnel's records and approve training requests; and

- TGen Learning and Development Unit personnel to schedule and record training sessions.

All training related data is recorded in the My Hub Training Management System, with the actual records stored in our records management system.

d) *Alcohol and other drugs*

In alignment with its fitness for work framework, Territory Generation has an alcohol and other drugs program in place. This program's intent is to promote a safe and healthy work environment for all workers, free from the hazards associated with the inappropriate use of alcohol and/or other drugs.

This program includes: random testing protocols inclusive of all sites and all persons (employee, contractor or visitor).

4 CONTRACTOR SAFETY

Territory Generation's Safety Management System (SMS) extends to all contractors who enter and conduct work on our sites.

- The selection and approval of contractors to undertake work on Territory Generation sites includes assessment of safety systems at the tender stage as a standard part of the procurement process.

- Territory Generation may engage a contractor whose safety management system meets Territory Generation SMS standards, the Corporation may accept that safety management system, but must inform the contractor of the key requirements of the Corporation's Safety Management System. If the Contractor does not meet Territory Generation SMS standards the contractor will be required to adopt the Corporation's SMS prior to commencing work.

- Territory Generation provides reasonable assistance to all contractors to support their participation in the Corporation's SMS.

- Contractor's construction induction (White Card), high risk licences and other qualifications and competency documents are verified by the responsible Territory Generation site contact person.

- All contractors are required to have relevant permit to work training and comply with all site induction processes.

- Relevant contractor training records are stored in Territory Generations Training Management System.

5   PUBLIC SAFETY

Territory Generation's power station sites are secured from general public access as follows:

- Perimeter fencing at all sites;

- Where appropriate on site security and/or regular security patrols;

- CCTV monitoring via control rooms and/or security at relevant sites;

- Safety signage posted at all sites to inform of restricted access and where applicable electrical safety signage is posted for information of the public.

- Site induction materials require visitors to be escorted at all times.

If permitted to enter a power station site, a member of the public is considered to be a visitor and all requirements relating to visitors apply to that person. The person is required to complete a site access induction and orientation course, must have a nominated site contact person and must be escorted by that person at all times. Exemptions may be granted on a case by case basis for escorted groups e.g. school tours.

6 ASSET MANAGEMENT

6.1 LOCATION OF ASSETS

Territory Generation is responsible for the following power stations:

- Channel Island Power Station (CIPS)
- Weddell Power Station (WPS)
- Katherine Power Station (KPS)
- Tennant Creek Power Station (TCPS)
- Ron Goodin Power Station (RGPS)
- Owen Springs Power Station (OSPS)
- Yulara Power Station (YPS) and
- Kings Canyon Power Station (KCPS).

Territory Generation is responsible for the following battery Energy Storage Systems (BESS) sites:

- Sadadeen Valley – Alice Springs

Diagram 3: Geographic location of Territory Generation assets

6.2 FORMATION OF ASSETS

All HV and LV equipment is required to be designed in accordance with relevant Australian Standards and international standards. The design process usually begins with the preliminary design review. During this stage, the project manager is responsible for ensuring that all the required processes are applied. For example the preliminary design review includes:

- Project definition and scope review;
- Preliminary Design (calculations, concept design, drawings);
- Operability and Maintainability review;
- Refine project work break down, scheduling, time , cost and resources;
- Refine budget estimates;
- Identification of design standards, regulations and requirements;
- Project and Business risk assessment.

The detailed design is usually contracted to a company with the expertise to produce "For Construction" or "For Tender" drawings and technical specifications based on the preliminary design. All drawings and specifications are reviewed by the project engineer to ensure that the design is safe and is fit for purpose based on functional requirements and site conditions.

For example the design verification process involves:

- Ensuring that all electrical plant/equipment has an adequate level of electrical protection during fault conditions;
- All plant and equipment are sized and specified appropriately based on the applications;
- Electrical earthing is applied and meets the required step and touch potentials;
- Drawings and Plant are allocated the correct numbering based on the numbering system;
- A design risk assessment to identify potential safety risks and hazards to operation and maintenance personnel (e.g. HAZOP);
- All plant/equipment can be isolated and secured both electrically and mechanically for repair and maintenance purposes.

One key feature of the project development is the recognition of the need for formal hazard studies at different phases of the project. A structured and systematic examination of both planned and existing process or operations enable Territory Generation to identify and evaluate problems that may represent risks to personnel or equipment, or prevent safe, reliable and efficient operation in the design, construction, commissioning and operating phase. This includes when changes are proposed to existing operations.

All plant and equipment (mechanical, electrical and gas) installed on Territory Generation sites are tested and commissioned by qualified personnel to ensure that they meet all the requirements specified in the detailed design. The project manager is responsible for ensuring that all testing and commissioning is conducted thoroughly and methodically by checking the inspection and test plans. Any issue or defects identified during testing are documented and are either rectified immediately or as a punch list item.

The Manager Assets & Engineering delivers sustaining and smaller capital and improvement projects.

The following strategies have been identified to improve safety practices:

- A robust change management process has been implemented to improve safety practices.

6.3 OPERATION OF ASSETS

i. *General*

The operation of electricity assets is undertaken in accordance with standard operating procedures for all Territory Generation sites. The essential requirements for operation of electricity assets include:

- Training in HV operating practices;
- Training in operation of the specific apparatus;
- Mandatory compliance training;
- Pre-arranged switching instructions based on a request from an approved Registered Training Organisation;
- Local conditions: precise apparatus / equipment identification signs, apparatus / equipment safety interlocks, ON /OFF indicators;
- Remote operation of the apparatus / equipment from control panels wherever possible;
- Personal Protective Equipment (PPE) for the person performing the operation;
- Management and supervisory review of on the job performance

Territory Generation requires all its HV operators to meet these essential requirements before they are accredited.

ii. *Remote operations Centre (ROC)*

The Remote Operations Centre provides the business with accurate, real-time control of generation assets. Connected by a high speed fibre optic data network, and protected by robust security and system redundancy, the ROC monitor real-time data relating to the operation of Territory Generation's gas, diesel and battery power generation options.

The ROC is located within Territory Generation's Corporate Head Office building at Berrimah. As part of built in redundancy and system security, from late 2018 a back-up centre can be activated at the Owen Springs Power Station to take over in the event of a cyclone or other disaster affecting Darwin. Territory Generation's new internal high-speed fibre communication and server network link the ROC to all Territory Generation work sites and generation assets by early 2019.

Remote operations have been commissioned in six power stations with the ROC having the ability to remotely control them. In addition, the Ron Goodin power station is fully monitored from the ROC.

The ROC includes an Operator Training Simulator (OTS) for training the Generation Controllers (GCs) based at the ROC and managing Territory Generation's generation portfolio. The OTS has been deployed for all the commissioned power stations, excluding Ron Goodin.

The GCs Shift Roster is specifically structured to maximise a mix of both Northern Region and Southern Region experienced GCs on shift and to further support the knowledge transfer and development of all GCs in the operation of all generating units.

Full Operation of the ROC requires well documented sets of responsibilities with the System Controller in the regulated networks especially with the introduction of Independent Power Producers in the regions where Territory Generation operates. Key documents include the following:

- Risk Assessment (per power station);
- Site Acceptance Plan (per power station);
- Principles of Operation;
- Operations Guides and Procedures (currently under development);
- OTS Instructor and User Guides.

6.4   MAINTENANCE OF ASSETS

All work on or near electricity infrastructure is performed in accordance with Territory Generation's Permit to Work (PTW) processes.

The essential requirements for maintenance of electricity assets include:

- PTW procedures ;
- The appropriate training and competency of workers inclusive of PTW and mandatory compliance training;
- Locks on High Voltage (HV) isolation and earthing switchgear to prevent the accidental change in position of that switchgear;
- Lock box and tagging processes;
- Pre-approved Plant Maintenance Manuals prescribing conditions of the work / equipment;
- Barriers to control access to the HV work area;
- Receipt of a PTW prior to any member of the team undertaking work;
- Specific prerequisites to obtain Permits;
- Development of Preventive Maintenance schedules and job plans;
- Use of the Asset Management System;
- Assessment of equipment spares, holdings;
- Safety Interactions to enable positive safety discussions on observed work activities;
- Provision of suitable Personal Protective Equipment (PPE) and instruction in its use.;
- On site task based risk assessment using Take 5 and Job Safety Environmental Analysis (JSEA);
- Higher level hazard assessment via Operational Risk Assessment Template if required.

The electronic permitting system has been effectively implemented at Channel Island, Weddell and Owen Springs Power Stations.

Electrical and Maintenance engineering capability has been added to the regional teams charged with the task of operating and maintaining the assets with each region. These engineering positions provide the day to day trouble shooting and oversight of operational events.

Guidance and oversight of the maintenance and operating activities are the responsibility of the Asset Management Team.   This team has been established to provide engineering expertise and advice across the various asset classes operated by Territory Generation. These Asset Engineers are allocated to the following:

- System;
- Balance of Plant & Gas;
- Larger Industrial gas turbines & steam plant;
- Aero derivative gas turbines;
- Reciprocating Engines;
- Smaller industrial gas turbines.

The following strategies have been identified to improve safety practices:

- Procedures for testing and commissioning have been implemented with continuous improvement updates in progress.
- Drawings and tagging at sites are being reviewed and replaced with as built standards.

6.5 SAFETY SYSTEMS AND STRATEGIES

Asset condition data is currently collected via the PRONTO Asset Management System.

PRONTO is an Enterprise Management System; the Asset Management System is populated by the fixed asset register for financial data and the Maintenance Management module for maintenance history and scheduling of preventative maintenance.

The data is stored in HPE Records Manager and can be linked to the work order. Asset history is maintained in the individual Asset Plans for the critical assets:

- From the maintenance records of equipment;
- By specific condition monitoring of nominated equipment;
- By the logging of work orders; and
- As an outcome of events logged in our incident or audit register system.

The formal introduction of Root Cause Analysis (RCA) techniques has been identified and programmed into Territory Generations development program. This strategy is to ensure a formal methodology is embedded within the organisation and trained facilitators are available to enable a RCA based culture with the corporation.

The following strategies have been identified to improve safety practices:

- Develop an optimised preventative maintenance program, and a formal change management system.
- Developing Preventative Maintenance (PM) and subsequent work order (WO) cost estimate codes.
- Improving PM tasks.
- Increasing amount of stock items linked to Plant items.

6.6 MITIGATION ACTIVITIES, INCLUDING DECOMMISSIONING

a) Asset Management Plans

The Asset Management System (AMS) enables Territory Generation to improve the efficiency and effectiveness of the management of assets. The AMS is designed to drive continuous improvement that provides long term benefits. An asset management plan has been approved for all Territory Generation power stations; these documents define the overarching strategies for the management of the power stations assets.

Continuous improvement measurers include changing technology, safety standards, and personnel development needs as well as recommendations from inspections, incident investigations and operational experience. The implementation of continuous improvement principles improves asset management programs and operational and maintenance safety outcomes.

b) Corrective maintenance

Territory Generation uses the PRONTO asset management system to enable management of corrective maintenance.

Corrective maintenance can be identified by any person on site who can then raise a Work Request in PRONTO. Maintenance personnel at all sites review the work requests regularly and convert them into Work Orders.

Territory Generation uses 4 levels of priority on Work Orders, 1 being immediate (today) and 4 being very low priority (next Shutdown/Opportunity). Work is scheduled in order of priority and availability of access to plant.

Corrective Work that is regarded as significant work requires additional approvals to proceed and may be run as a project (CAPEX or OPEX).

c) Corrective and Preventative actions:

Corrective and preventative actions arising from investigations, audits and Safety Interactions may be either immediately initiated as work orders or managed through action plans raised in the Incident Management System (IMS).

Actions are assigned to a responsible person with the time frame for completion allocated by the assigning officer. Actions can be monitored through the My Tasks/ My Staff's Task functions in the IMS. Reports can also be generated from the IMS to monitor timely and appropriate closure.

d) Review of plant performance and condition:

Specialist contractors are engaged from time to time to conduct external audits of equipment and practices. Examples include inspection of pressure vessels, Heat Recovery Steam Generators (HRSG), Gas systems, fire systems. In addition there are a number of links to Original Equipment Manufacturers (OEMs) through arrangements such long term service agreements, user group membership and provision of remote monitoring. This ensures that Territory Generation keeps up-to-date with the user base experience of similar equipment.

Roles within Territory Generation provide coordination and analysis of plant reliability and performance including control systems. Regular ongoing condition monitoring (including vibration monitoring, oil analysis, thermography etc.) are carried out and/or organized by the Reliability and Performance team. Plant performance is reported monthly.

e) Replacement of assets:

The Asset Management Plans identify and / or forecast the end of life for each critical asset. In addition to this regular ongoing inspection and monitoring, aged plant is also assessed for its suitability for continued operation or retirement based on safety, operability, reliability, efficient operational and maintenance costing, and compliance with current standards.

Assessment is carried out by the Territory Generation Asset group using forecasts from Asset Management Plans, feedback from operations and maintenance personnel and on data collected from sources such as: maintenance documentation, OEM recommendations, industry bodies / associations and any product service bulletin.

Based on collected data a decision to overhaul or replace is made. In some instances (for example if it is a significant work, a project is created to carry out replacement or overhaul work.

f) Decommissioning of assets:

Plant and equipment at the end of its economic life has ended is removed from service. Prior to its removal it goes through a decommissioning process. As part of that process, the plant and equipment is physically disconnected from all energy sources.

7 CORPORATE COMPLIANCE

The effectiveness of a safety management system requires a robust governance and compliance management process. Territory Generation's compliance with relevant laws, regulations, industry codes and acceptable ethical standards is important in reducing organisational risk and avoiding the potential significant consequences associated with non-compliance.

WHS compliance obligations are identified, recorded and managed under Territory Generation's Compliance Framework.

Diagram 4: Governance, risk and compliance framework

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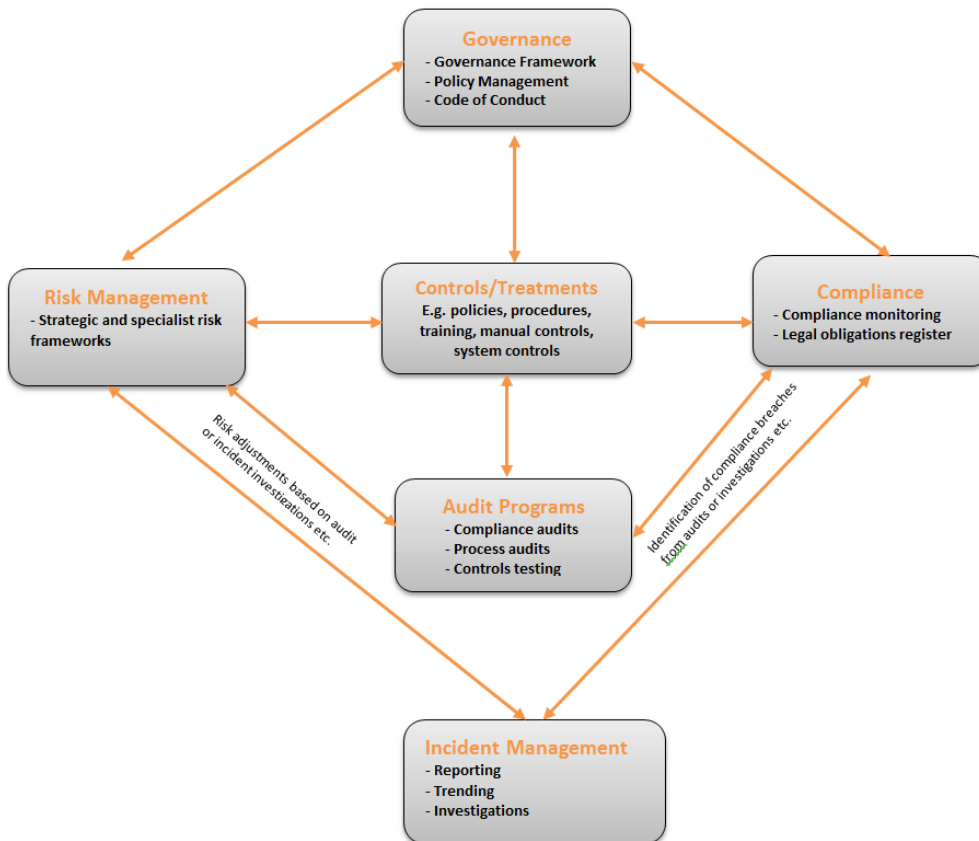
8 CORPORATE RISK MANAGEMENT

Territory Generation recognises that risk is an integral component of our business and corporate governance. The Corporation fosters a risk-aware corporate culture in decision making through the application of high quality, integrated risk analysis and management. Territory Generation is committed to managing all risks in a proactive and effective manner through standardised methodologies and processes based on the Standard AS/NZS ISO 31000:2009 *Risk Management Principles and Guidelines.*

The Corporation has an enterprise wide risk framework that covers all strategic risks of the corporation and which summarises these into six (6) categories: Health & Safety, Environment & Sustainability, Financial, Legal/Regulation, People & Culture, Customer and Stakeholder Management.

Corporate safety risks are recorded on a *Corporate Risk Register* which is managed by Territory Generation's Risk and Compliance team. Safety risks are allocated to relevant *Risk Owners* to monitor and review. New safety risks may be identified and added to the *Corporate Risk Register* as per processes outlined in the Corporate Risk Management Framework.

9 HAZARD IDENTIFICATION & OPERATIONAL RISK MANAGEMENT

Territory Generation uses a proactive, planned and systematic approach to hazard identification and risk management to cover all reasonably foreseeable hazards and associated risks to health and safety.

Hazards are identified and managed using the following processes:

- Task based risk assessment using real time tools such as Job Safety Environmental Analysis (JSEA) and Take 5 or equivalent;

- Operational risk assessment for complex or high risk work activities / outages;

- Project risk assessment and risk registers including the use of safety management plans and safe work method statements for high risk construction work activities;

- Completion of any specific risk assessments which may be required under legislation or codes of practice for high risk activities such as confined space entry, working with hazardous chemicals, or the conduct of hazardous manual tasks etc.

Hazard identification and subsequent management also occurs through the following processes:

- Topics raised with Health and Safety Representatives (HSRs) or at Health and Safety Committee meetings,

- Workplace inspection – Either formal (e.g. scheduled inspections/field audits) or informal (e.g. during a site walk around),

- Safety Conversations which are promoted at all levels throughout the organisation,

- Consultation with workers conducting the work,

- Having the hazard present as an incident / or where there is a Near Miss associated with a hazard reported in MyHub Incident Management System (IMS),

- Direct reporting of hazards (without incident) in the MyHub IMS,

- Review of available information from industry specific sources such as industry associations, technical specialists, manufacturers and supplier information and also through analysis of health and safety reports, worker complaints, audit and inspection reports etc., and

- Facilitation of higher level identification processes such as HAZOP (Hazard Operability); process mapping etc. where applicable.

A Corporate risk matrix is used to determine likelihood and consequence in the calculation of risk. The Hierarchy of Controls is used to select the most effective control possible.

Any person who implements a control measure is required to ensure that the control measure is effective and is maintained so that it remains effective. Implemented controls are reviewed and as necessary revised so as to maintain, so far as is reasonably practicable, a work environment that is without risks to health or safety. Stop work and reporting escalation processes are in place should any residual risk be calculated as high, very high or extreme.

10 INCIDENT MANAGEMENT

Territory Generation has an electronic Incident Management System to support proactive incident reporting, investigations and action management.
The *MyHub Incident Management System* (MyHub IMS) enables employees to record incident notifications, initiate and record incident investigations and manage actions arising out of completed investigations.

Incident reporting is critical in supporting the development of a positive safety culture and a safer workplace. Active reporting is encouraged at all times at all levels of the organisation.

Incidents to be reported and managed in this system include:

- Hazard;
- Near miss;
- Injury/Illness;
- Permit to Work;
- Environmental;
- Damage, failure or loss;
- Security;
- Vehicle, and;
- Operational (plant failure).

Territory Generation has embedded the use of the Incident Cause Analysis Method (ICAM) for all incident investigations. The primary focus of incident investigations is the identification of the root cause to identify and rectify safety issues in order to ensure learning (continuous improvement) and the prevention of reoccurrence.

The *MyHub Incident Management System* has a specific section included for the electronic recording of Operational incidents. Operational incidents have been defined as incidents in which there was failure or faults leading to a plant trip, critical operations equipment failure or reduced generation capability. Examples include but are not limited to:

- Generating unit trips.

- Significant generating unit capability reductions such as the loss of unit capability due to failure or non-performance of a component e.g. GT burner spreads, vibration, temperature alarms etc. (Note: Reduction in unit performance due to ambient temperature conditions is not to be reported).

The addition of this function enables the centralisation of records relating to these incidents.

11 MANAGEMENT REPORTING

The management reporting process consists of regularly providing reports on the status of the *Safety Management System* to the CEO, senior management and the Board.

Territory Generation applies transparent processes so all monthly WHS reports are distributed to all persons by email and summaries are displayed on site safety boards.

Reports contain information on reporting against agreed WHS measurement objectives and targets as well as matters that relate to Safety Management System conformance or its enhancement as identified from incident assessments, reviews and audits.

WHS measurement objectives and targets have been formed for the assessment of health and safety performance.

This includes, but is not limited to, the following measures:

Injury statistics (Lag indicators):

- Lost time injury (LTI) and Lost Time Injury Frequency Rate (LTIFR) ;
- Medically treated injuries, and;
- First aid treated injuries.

Significant incidents:

- Incidents notifiable to NT WorkSafe.

Positive performance (Lead indicators):

- Safety Conversations (Safety Interactions (SI), and Safe Act Observations (SAO)) completed vs allocated target
- Incident reporting in system within 24 hours of the incident occurring.
- Incident investigations closed by allocated due date
- Actions closed by allocated due date

The Executive Health Safety Environment and Sustainability Committee (HSES) is responsible for assessing and, where considered appropriate, actioning all recommendations relating to the Corporate Safety Management System conformance or its enhancement.

WHS Summary Reports are tabled at scheduled senior management meetings. WHS reports on measurable objectives, targets and recommendations/actions, summary reports on notifiable/high risk incidents are presented to the Board on a monthly basis.

The People and Safety Board Subcommittee meet on a quarterly basis and review all WHS reports to provide overview and governance.
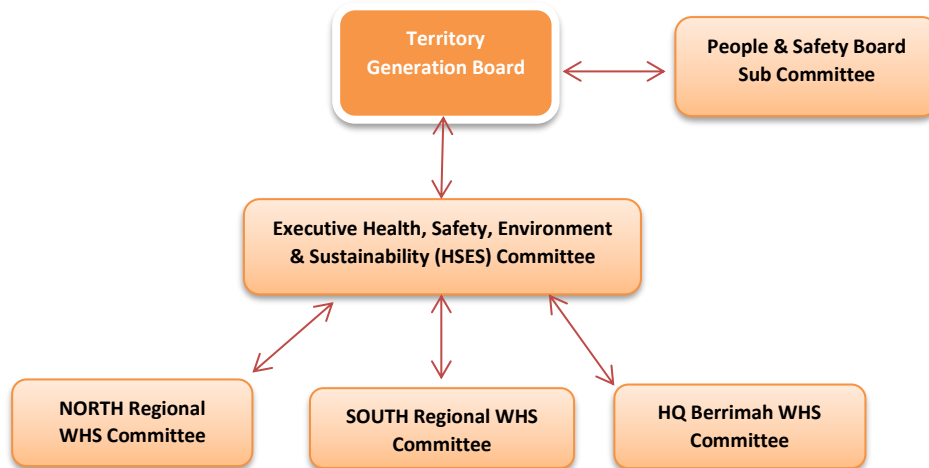
12   CONTINUOUS IMPROVEMENT

Territory Generation ensures continuous improvement via a cyclic process of auditing, inspections and reviews as follows:

- Field reviews of real-time work practices associated with scheduled work.

- Safety Conversations program at all sites.

- Regular workplace inspections to ensure a safe working environment is maintained.

- The risk framework is reviewed on a regular basis to ensure that it remains effective in the ongoing identification and management of risks.

- The compliance framework is reviewed annually with all compliance obligations maintained in a Compliance Register. Compliance is monitored through self-assessments, audits and reviews.

- The audit framework consists of:
  o External Audit – annual financial audit and specialist audits conducted by the Auditor General, Utilities Commission and other regulatory bodies;
  o Internal Audit - system (frameworks), process and compliance audits conducted by Territory Generation's Internal Auditor;

- The Internal Audit program is drawn up via consultation with the Board, Executive Leadership Team and Management, consideration of Territory Generation's Statement of Corporate Intent, Corporate Strategy, risk profile and changes to the operating environment. The scope of work to be undertaken is approved by the Territory Generation's Board.

- Monthly reporting includes trending reports enabling identification of areas requiring initiatives to improve safety outcomes. Reports are reviewed at various forums including senior management meetings, WHS committee meetings, ELT meetings and Board meetings. Various trending reports are also reviewed by executive management.

- Benchmarking and networking with like utilities in order to achieve industry best practice and continuous improvement are conducted. Examples include: Participation in Australian Energy Council (AEC) National OHS Generator Working Group and submitting organisational safety data to national generator benchmarking reports.

13 CONSULTATION AND COMMUNICATION

Territory Generation utilises the following formal WHS committee structure to steer, monitor, resolve and report on safety:

Diagram 5: Safety committee structure

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                    ┌──────────────────┐        ┌──────────────────┐
                    │    Territory      │◄──────►│ People & Safety   │
                    │ Generation Board  │        │ Board Sub         │
                    │                   │        │ Committee         │
                    └────────┬──────────┘        └──────────────────┘
                             │
                    ┌────────┴──────────────────┐
                    │ Executive Health, Safety,  │
                    │ Environment & Sustainability│
                    │    (HSES) Committee         │
                    └──┬────────┬──────────┬──────┘
                       │        │          │
          ┌────────────┘        │          └────────────┐
    ┌──────────────┐    ┌──────────────┐    ┌──────────────┐
    │ NORTH Regional│    │ SOUTH Regional│   │ HQ Berrimah   │
    │ WHS Committee │    │ WHS Committee │   │ WHS Committee │
    └──────────────┘    └──────────────┘    └──────────────┘
```

- All WHS Committee meetings (with exception of the Board subcommittee) are held monthly, or more frequently as required.

- People & Safety Board subcommittee meetings are held quarterly.

- All committees have clear terms of reference, established reporting and escalation processes.

- Other additional subcommittees reporting to either the Executive HSES Committee or regional WHS Committees may be established as required to address specific issues or projects.

- The formation of additional work groups is actively encouraged.

- Territory Generation currently has a total of eight (8) elected Health and Safety Representatives (HSRs); nine (9) Deputy HSRs and ten (10) established workgroups.

- Internal Communications are facilitated by various means including but not limited to: all of organisation site videoconferencing, intranet, email, tool box talks, WHS Committees, posting of notices and flyers to site safety boards and forums.

- Safety bulletins released cover information such as incidents, actions, incident investigation findings etc. and these may be sent to all Territory Generation employees or to targeted sites; where relevant.

14 CHANGE MANAGEMENT

The Territory Generation Change Management guideline establishes a framework for the control and assurance of changes being made including people, process changes (hardware, software and process control/process conditions changes) as well as policies, procedural and organisational changes. Industries often refer to these as the 3P's, People, Policies and Procedures.

The change management process is critical in meeting business objectives including asset integrity, HSE (including process safety), production objectives and targets, quality, schedule and costs.

Changes that affect a large part of the organisation require a paper presented and approved by the executive leadership team who meet weekly.

The Territory Generation Change Management guideline applies to operational changes (assets, hardware, software and materials, process control and process conditions changes), procedural, policy and organisational changes that are the responsibility of Territory Generation.

An appropriate level of oversight is provided for by ensuring that the organisation's risk matrix is used to gauge the risk rating. It ensures that changes are recorded and any modifications are subject to appropriate review and control.

15 CRISIS MANAGEMENT

Territory Generation has implemented crisis and emergency management processes.

- The *Corporate Emergency Management Plan* provides a comprehensive framework within which senior management can manage a crisis, creates clear and defined objectives for recovery.
- The North Region Cyclone response procedure provides guidance to support the Corporation's response in the event of a cyclone and is used in conjunction with the above plan.
- The Katherine Power Station Flood Action Plan provides response information to actual or potential emergency's that may arise due to flooding.
- Both of the above documents have been developed to interface with Power and Water and Northern Territory Government (NTG) emergency management and response processes (Public Utilities Group).
- Territory Generation Corporate Incident Controller (CIC) facilitates relevant exercises and participation with relevant NTG exercises to ensure emergency preparedness.
- Site specific emergency plans have been developed for all manned sites and cover the full gamut of emergency categories that may affect each site.
- Site emergency exercises are held by the relevant Site Manager or Site Coordinator with debriefing reports saved in HPE Records Manager.
- Site emergency plan codes and descriptors:

Colour Code and category	Descriptors relevant to this site
CODE ORANGE: Evacuation	➢ Evacuation
CODE RED: Fire	➢ Fire/smoke/explosion
CODE YELLOW: Internal emergency	Failure or a threat to essential services: ➢ Chemical spill ➢ Natural gas leak ➢ Hydrocarbon or oil spill ➢ Civil disorder & Illegal occupancy
CODE PURPLE: Bomb/biological threat	➢ Bomb threat ➢ Biological threat
CODE BLACK: Personal threat	➢ Personal threat ➢ Hostage threat
CODE BLUE: Medical emergency	Medical emergency: ➢ Serious personal injury ➢ Respiratory or cardiac arrest
CODE BROWN: External emergency	Natural disaster: ➢ Cyclone / Bushfire

16 DOCUMENT MANAGEMENT

The document hierarchy used to support Territory Generation's Safety Management System is as follows:

- Safety Management System Policy and Procedure;
- Safe Work Documents - WHS Operational Procedures and Work Instructions, and;
- Real Time Safe Work Documents - WHS registers/forms/templates/checklists etc.

Diagram 6: Safety Management System (SMS) document framework
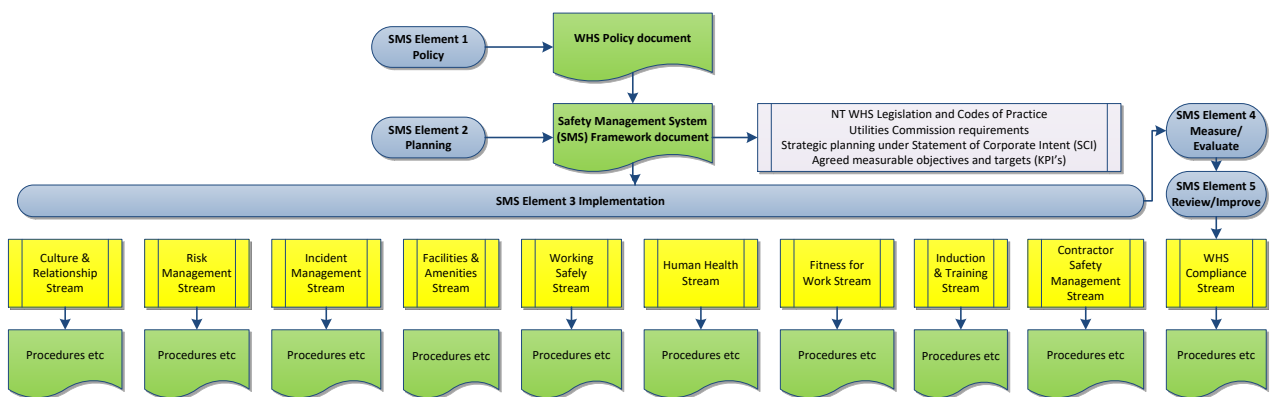
Territory Generation controlled document process ensures personnel have access to current documents in a standardised and quality controlled format. All controlled documents have a nominated Document Owner responsible for the documents' preparation and review and a Document Sponsor responsible for the documents' final approval and release. Approved controlled documents are published in a Document Database linked to the documents' original location in HPE Records Manager as a central access portal.

All Safety Documents are considered live documents and are updated as required to ensure their ongoing currency and relevance.

DOCUMENT LIST

Document	Location
WHS Strategic	
Territory Generation WHS Policy Document	Tgen Intranet
Safety Non Negotiables Procedure	CONTROL0356
Stop Unsafe Work Procedure	CONTROL0345
Safety Non Negotiables Procedure	CONTROL0356
Safety Management System (SMS)	
Safety Management System Policy	TGENBDOC2014/4
Safety Management System Procedure	TGENBDOC2014/5
Operational risk management	
Hazard identification and Risk Management Procedure	CONTROL0335
Job Safety and Environmental Analysis (JSEA) Procedure	CONTROL0332
JSEA Template	CONTROL0331
Working at Heights Checklist	BDOC2013/107
Operational Risk Assessment Procedure	CONTROL0333
Operational Risk Assessment Template	CONTROL0334
Take 5 Procedure	CONTROL0065
Incident management	
Incident Reporting Procedure	BDOC2014/247
Incident Investigation Procedure	TGENQDOC2016/23
Contractor safety management	
Contractor Safety Management Procedure	BDOC2014/294
PTW-09 SSoW Manual section; I - Contractors	TGD2017/50268
Induction and site access	
Minimum Dress Code and PPE Requirements Procedure	BDOC2014/183
Site Induction Procedure	CONTROL0376
Channel Island Power Station (CIPS) Employee & Contractor Site Induction	CONTROL0105
Channel Island Power Station (CIPS0 Visitor Site Induction	CONTROL0106
Weddell Power Station (WPS) Employee & Contractor Site Induction	CONTROL0117
Weddell Power Station (WPS) Visitor Site Induction	CONTROL0118
Document	**Location**

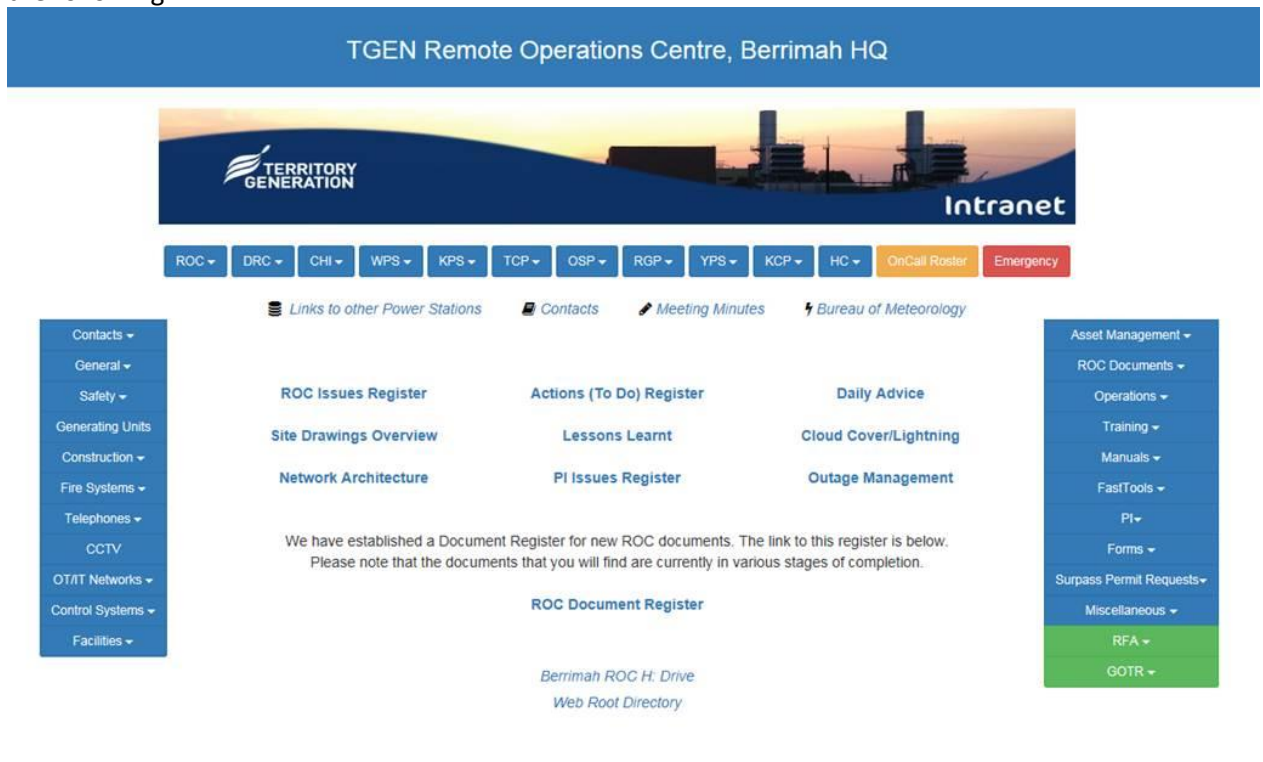| Ron Goodin Power Station (RGPS) Employee & Contractor Site Induction	CONTROL0113
Ron Goodin Power Station (RGPS) Visitor Site Induction	CONTROL0114
Owen Springs Power Station (OSPS) Employee & Contractor Site Induction	CONTROL0111
Owen Springs Power Station (OSP)S Visitor Site Induction	CONTROL0112
Sadadeen Battery Energy Storage System (BESS) Employee & Contractor Site Induction	CONTROL0377
Sadadeen Battery Energy Storage System (BESS) Visitor Induction	CONTROL0378
Tennant Creek Power Station (TCPS) Employee & Contractor Site Induction	CONTROL0115
Tennant Creek Power Station (TCPS) Visitor Site Induction	CONTROL0116
Yulara Power Station (YPS) Employee & Contractor Site Induction	CONTROL0119
Yulara Power Station (YPS) Visitor Site Induction	CONTROL0120
Katherine Power Station (KPS) Employee & Contractor Site Induction	CONTROL0109
Katherine Power Station (KPS) Visitor Site Induction	CONTROL0110
Kings Canyon Power Station (KCPS) Employee & Contractor Site Induction	CONTROL0107
Kings Canyon Power Station (KCPS) Visitor Induction	CONTROL0108
Berrimah HQ Site Induction and Orientation	CONTROL0058
General Induction Presentation	TGD2017/35178
General Induction Assessment	TGD2017/31677
Permit to Work	
Permit to Work training presentation / Module 2 Worker	TGD2017/35177
Permit to Work competency assessment/ Module 2 Worker	TGD2017/7043
Permit to Work training presentation / Module 3 Person in Charge of Work & Self Isolation	TGD2017/31682
Permit to Work competency assessment / Module 3 - Person in Charge of Work	TGD2017/7046
Permit to Work competency assessment / Module 3 - Self Isolation	TGD2017/7047
Permit to Work training presentation / Module 4A - Isolation Officer	TGD2017/31673
Permit to Work competency assessment / Module 4A - Isolation Officer	TGD2017/7045
Permit to Work training presentation / Module 4B - Permit to Work Officer	TGD2017/31672
Permit to Work competency assessment / Module 4B - Permit to Work Officer	TGD2017/7044
PTW-01 SSoW Manual section; A - Introduction	TGD2017/49678
PTW-02 SSoW Manual section; B - Work, Health & Safety System	TGD2017/49677
SSoW Manual section; C - Induction and Communications	TGD2017/49674
Document	**Location**
PTW-04 SSoW Manual section; D - Risk, Hazard & Incident Management	TGD2017/49676

PTW-05 SSoW Manual section; E - Permit System	TGD2017/49669
PTW-06 SSoW Manual section; F - Isolation & Lockout	TGD2017/49670
PTW-07 SSoW Manual section; G - Confined Space	TGD2017/50100
PTW-08 SSoW Manual section; H - Hot Work	TGD2017/50107
PTW-09 SSoW Manual section; I - Contractors	TGD2017/50268
PTW-10 SSoW Manual section; J - Electrical Plant & Equipment	TGD2017/50183
PTW-11 SSoW Manual section; K - Fitness for Work	TGD2017/50200
PTW-12 SSoW Manual section; L - General WHS Standards & Guidelines	TGD2017/49959
PTW-13 SSoW Manual section; M - Glossary and Index	TGD2017/49964
PTW-05A Planning and Risk Assessment (PRA)	TGD2017/95499
PTW-05B Minor Works Permit	TGD2017/95501
PTW-05C Permit to Work	TGD2017/95502
PTW-05D High Voltage Access Permit	TGD2017/95507
PTW-05E Permit Additional Signature Sheet	TGD2017/95508
PTW-05F PTW Suspension Resumption Transfer Sheet	TGD2017/95509
PTW-05G Transfer of a Permit in Absence Checklist	TGD2017/95510
PTW-05H Change Request Form	TGD2017/95511
PTW-05I Statement of Condition of Apparatus or Plant(SCAP)	TGD2017/95512
PTW-05K Permit Flowchart	TGD2017/95525
PTW-05L Permit Revalidation Extension Sheet	TGD2017/95513
PTW-06A Isolation Certificate	TGD2017/95514
PTW-06B Isolation Plan Overflow Sheet	TGD2017/95515
PTW-06B2 Restoration Plan Overflow Sheet	TGD2017/95516
PTW-06C Safe System Inhibit Certificate (SSIC)	TGD2017/95517
PTW-07A Confined Space Certificate	TGD2017/95518
PTW-07B Atmospheric Testing/Monitoring Sheet	TGD2017/95519
PTW-07C Confined Space Entry/Exit Log	TGD2017/95520
PTW-08A Hot Work Form (HWF)	TGD2017/95521
PTW-08B Hot Work Observer & Resumption Overflow Sheet	TGD2017/95522
Document	**Location**
PTW-12A Excavation/Penetration Certificate (EPC)	TGD2017/95523
Working at Heights/Preventing Falls Control Form (PFF)	TGD2017/95524

Safety procedures - GENERAL	
Chemical Management Procedure	BDOC2013/96
Chemical Inspection Procedure	BDOC2013/97
Electric Shock Procedure	CONTROL0368
Asbestos Management Plan/Procedure	BDOC2014/243
Plant Asbestos Management Procedure	BDOC2013/100
Legionella Health Risk Management Procedure	BDOC2013/101
Working at Heights Procedure	BDOC2014/207
Hazardous Manual Tasks Procedure	CONTROL0357
Noise Management Procedure	CONTROL0090
Storm Safety Procedure	CONTROL0067
Hepatitis Vaccination Program	BDOC2013/108
Use of Temporary Barrier Tape Procedure	BDOC2014/159
Mobile Plant Procedure	BDOC2014/221
Plant and Equipment Procedure	BDOC2014/231
Cranes and Lifting Equipment Procedure	CONTROL 0358
Scaffolds and Scaffolding Work Procedure	BDOC2014/259
Construction Work Procedure	BDOC2014/291
Working in Hot and Cold Environments Procedure	BDOC2014/273
Safe Travel Procedure	CONTROL0384
Work in Isolation Procedure	CONTROL0383
Two Way Radio Procedure	Drafted
Fitness for work	
Fitness for Work Procedure	BDOC2014/251
Fatigue Management Procedure	BDOC2014/250
Alcohol and Other Drugs Procedure	TGENQDOC2017/001
Safety Culture	
Safety Conversations Procedure	CONTROL0355
Document	**Location**
Fair and Just Culture Procedure	TGEN2016/000015
Safety Performance Monitoring, Objectives & Targets Procedure	TGENBDOC2014/6
Communication and Consultation	

Safety Communications Procedure	CONTROL0346
Health & Safety Representatives & Workgroup	CONTROL0347
Work Health and Safety Committee Procedure	CONTROL0348
Health and Wellbeing	
Safe Workplaces Procedure	CONTROL0036
First Aid Management Procedure	CONTROL0367
Injury Management Procedure (HR)	CONTROL0055
Emergency Preparedness	
Corporate Crisis Management and Recovery Manual	TGENBDOC2015/2
North Region Cyclone Preparation, Response and Recovery Procedure	CONTROL0093
Katherine Power Station Flood Action Plan	TGENQDOC2016/4
Site specific emergency plans	Document database
Corporate Risk Management	
Corporate Risk Framework	ADMIN-005
Corporate Risk Policy	ADMIN-006
Risk Assessment Guide	ADMIN-009
Risk Management Guidelines	ADMIN-004
Corporate Master Risk Register	TGD2015/31570
Asset Management - Arc flash management and risk mitigation project documentation:	
Channel Island Power Station	TGD2017/32992
Weddell Power Station	TGD2017/52872
Katherine Power Station	TGD2017/53520
Yulara Power Station	TGD2017/94773
Ron Goodin Power Station	TGD2017/46026
Compliance Management	
Compliance Policy	CONTROL0006
Compliance Strategy	CONTROL0007
Document	**Location**
Compliance Register	TGD2015/58289
Compliance Breach Management Procedure	TGENQDOC2016/31
Document Management	
Document Management Procedure	CONTROL0001

Change Management	
CM.POL.001 Change Management Policy	TGD2016/93114
CM.GDL.001 Change Management Guideline	TGD2016/93113
CM.FRM.001 Change Management Framework	TGD2016/103360
CM.FRM.002 - Change Management Process Flow Charts	TGD2017/48770
CM.FRM.002 - Change Management Request and Control Forms	TGD2016/93115
ROC Documentation	

ROC documentation is stored on the Berrimah H: drive and accessible by a web front end that looks like the following:

17 GLOSSARY

The following Glossary is provided to assist the reader in understanding the unique words and acronyms that are used within Territory Generation in regard to safety process and practices.

Acronym	Meaning
CIPS	Channel Island Power Station
WPS	Weddell Power Station
KPS	Katherine Power Station
RGPS	Ron Goodin Power Station
OSPS	Owen Springs Power Station
TCPS	Tennant Creek Power Station
YPS	Yulara Power Station
KCPS	Kings Canyon Power Station
PTW	Permit to Work
MyHub	The portal to access Incident, Risk and Compliance systems
HAZOP	Hazard and Operability Study
JSEA	Job Safety Environmental Analysis
Take 5	Personal pre task risk assessment
PPE	Personal Protective Equipment
SAO	Safe Act Observations
SI	Safety Interaction
SMS	Safety Management System
TMS	Training Management System
HPE RM	Electronic document and records management system (replaces TRIM)
HV/LV/DC	High Voltage/Low Voltage/Direct Current

18 Roles and Responsibilities

Role / Title	Responsibility
• CEO	• The sponsor of this plan.
• GM Assets and Operations • Manager Safety	• Responsible for preparing this plan and liaising with key stakeholders to review and update this document.
• General Counsel & Company Secretary	• Liaison with Utilities Commission.
Key stakeholders	
• General Counsel & Company Secretary • Manager Assets and Engineering • Manager Learning and Development • Manager Risk and Compliance • Manger Business Services • Remote Operations Centre Coordinator • Records Officer	• Participated in the review of this plan.

19 Records

Information from this plan is captured, stored and managed in the TGen Electronic Document and Records Management System (HPE RM) and controlled in the Controlled Document Register (HPE RM).

20 Review

This plan will be reviewed annually.

21 Document History

Date of Issue	Version	Prepared By	Description of Changes
	8.0	Manager Safety	Document review and update Feb 2020 in preparation for submission.