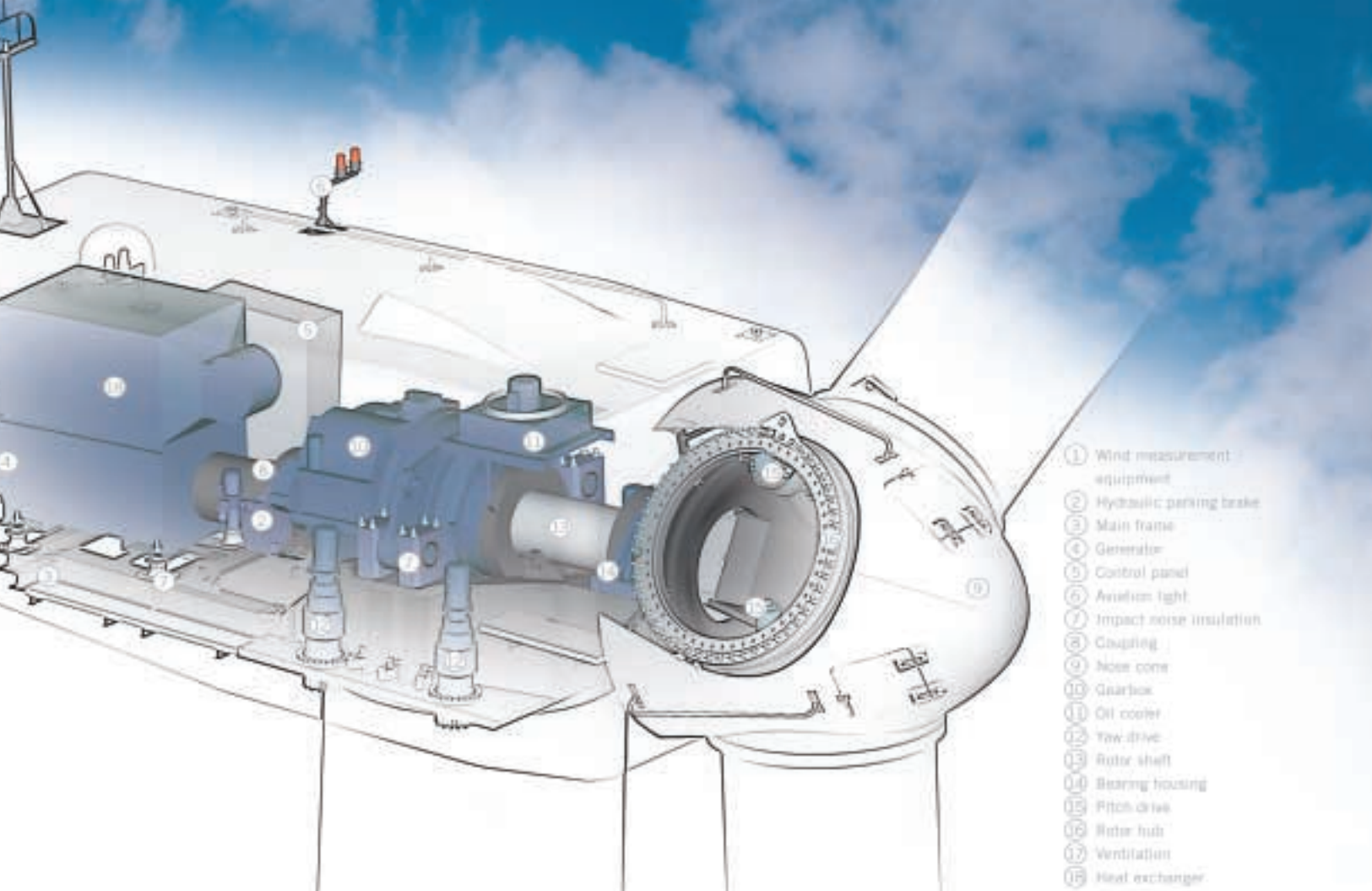


APPENDIX D MACHINERY AND EQUIPMENT

D 1 - GE TURBINE GENERAL DESCRIPTION



- ① Wind measurement equipment
- ② Hydraulic parking brake
- ③ Main frame
- ④ Generator
- ⑤ Control panel
- ⑥ Aviation light
- ⑦ Impact noise insulation
- ⑧ Coupling
- ⑨ Nose cone
- ⑩ Gearbox
- ⑪ Oil cooler
- ⑫ Yaw drive
- ⑬ Rotor shaft
- ⑭ Bearing housing
- ⑮ Pitch drive
- ⑯ Rotor hub
- ⑰ Ventilation
- ⑱ Heat exchanger

Technical specifications

	1.5sl	1.5sl	1.5s	1.5se
Operating data				
• Rated capacity:	1,500 kW	1,500 kW	1,500 kW	1,500 kW
• Cut-in wind speed:	3.5 m/s	3.5 m/s	4 m/s	4 m/s
• Cut-out wind speed				
600 s average:	25 m/s	20 m/s	WZ II: 22 m/s WZ III, IEC II: 25 m/s	25 m/s
30 s average:	IEC s: 28 m/s	WZ II: 23 m/s	WZ II: 25 m/s WZ III, IEC II: 28 m/s	IEC I: 28 m/s
3 s average:	IEC s: 30 m/s	WZ II: 25 m/s	WZ II: 27 m/s WZ III, IEC II: 30 m/s	IEC I: 30 m/s
• Cut-back-in wind speed				
300 s average:	IEC s: 22 m/s	WZ II: 17 m/s	WZ II: 19 m/s WZ III, IEC II: 22 m/s	IEC I: 22 m/s,
• Rated wind speed:	12 m/s	12 m/s	12 m/s	12 m/s
Rotor				
• Number of rotor blades:	3	3	3	3
• Rotor diameter:	77 m	77 m	70.5 m	70.5 m
• Swept area:	4,657 m ²	4,657 m ²	3,904 m ²	3,904 m ²
• Rotor speed (variable):	10.1 – 20.4 rpm	10.1 – 20.4 rpm	11.1 – 22.2 rpm	11.1 – 22.2 rpm
Tower				
• Hub heights (m):	61.4* / 64.7* / 80* / 85*	61.4* / 64.7* / 80* / 85* / 100*	64.7** / 80** / 85** / 100*	52.6*** / 54.7*** / 64.7***
Power control:	Active blade pitch control	Active blade pitch control	Active blade pitch control	Active blade pitch control

- Operating limits** (outside temperature)
- cold weather light: -20° C to +40° C
 - cold weather extreme: -30° C to +40° C / -40° C to +50° C survival without operation
- Control system**
- PLC (Programmable logic controller)
 - Remote control and monitoring system
- Gearbox**
- Three step planetary spur gear system
- Generator**
- Doubly fed three-phase asynchronous generator

- Braking system** (fail-safe)
- Electromechanical pitch control for each blade (3 self-contained systems)
 - Hydraulic parking brake
- Yaw system**
- Electromechanical driven with wind direction sensor and automatic cable unwind
- Converter**
- Pulse-width modulated IGBT frequency converter
- Tower design**
- Multi-coated, conical tubular steel tower with safety ladder to the nacelle
 - Load lifting system, load-bearing capacity over 200 kg
 - Service platform for 100 m hub height (service lift optional)

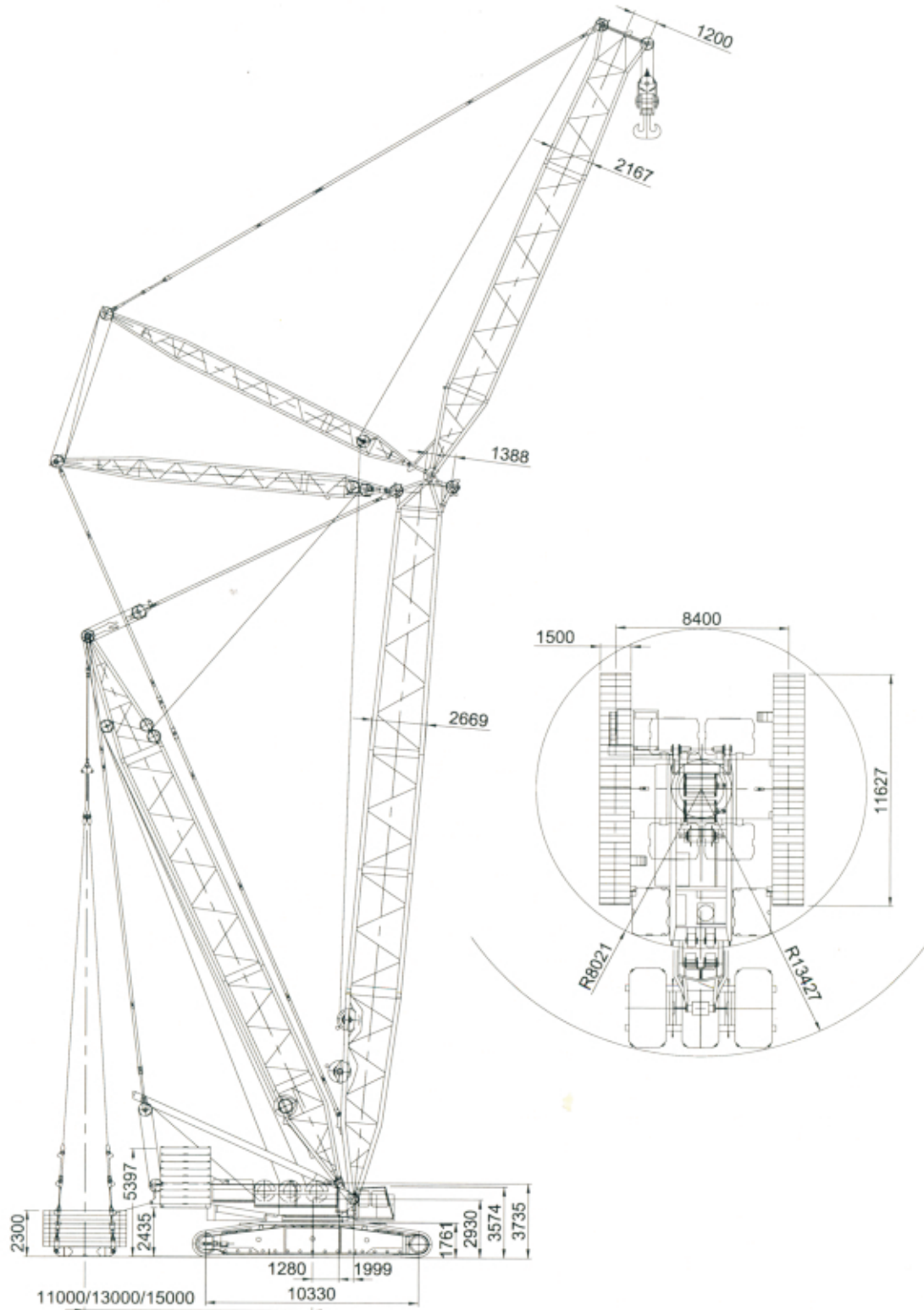
- Noise reduction**
- Impact noise insulation of the gearbox and generator
 - Sound reduced gearbox
 - Noise reduced nacelle
 - Rotor blades with minimised noise level
- Lightning protection system**
- Lightning receptors installed on blade tips
 - Surge protection in electrical components
- * for WZ II ** for WZ III / IEC II
*** for IEC I * for IEC s

Subject to technical alterations, errors and omissions.

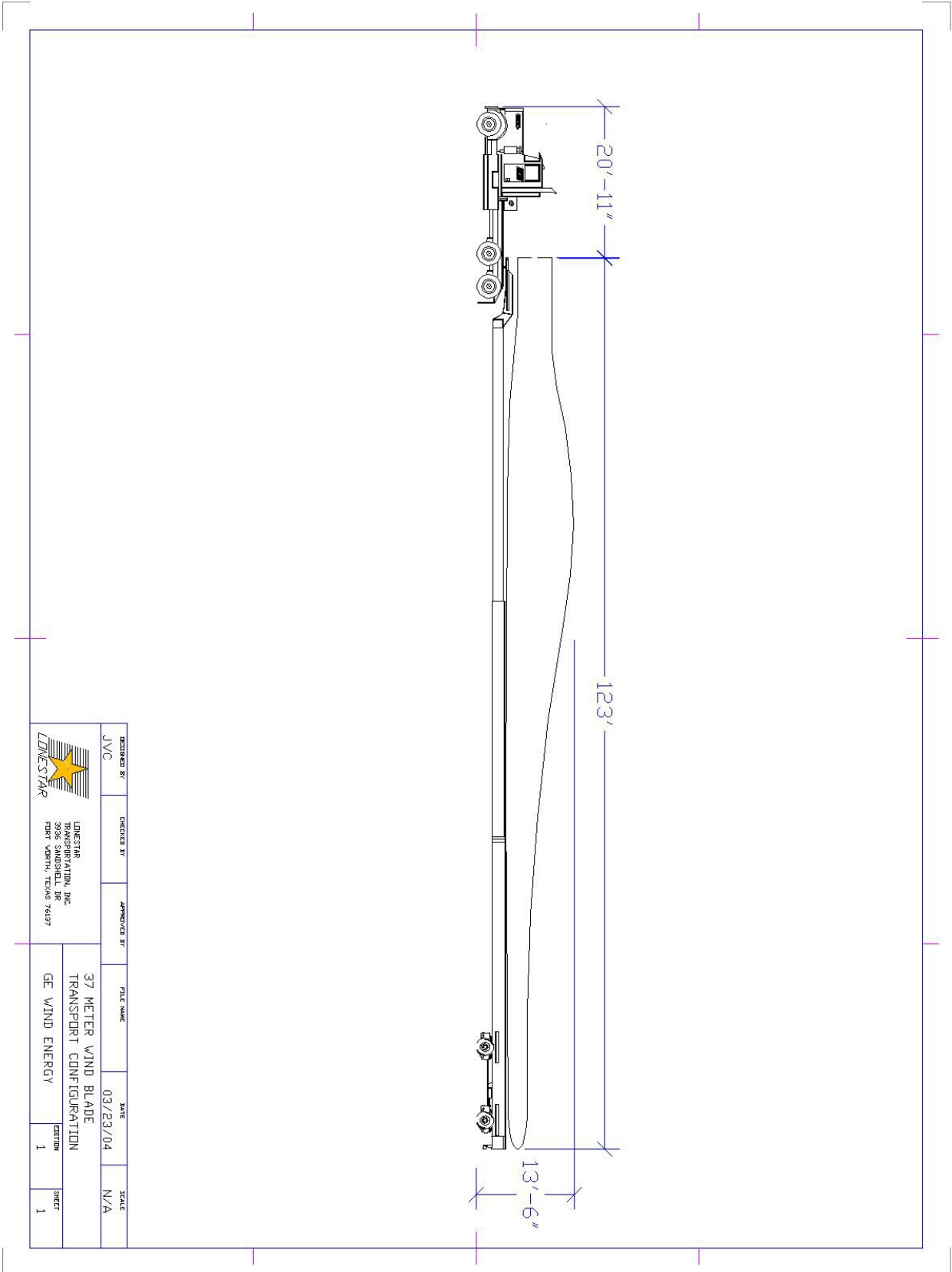
D3- CRANE GENERAL DIMENSIONS




DEMAG CC 2800

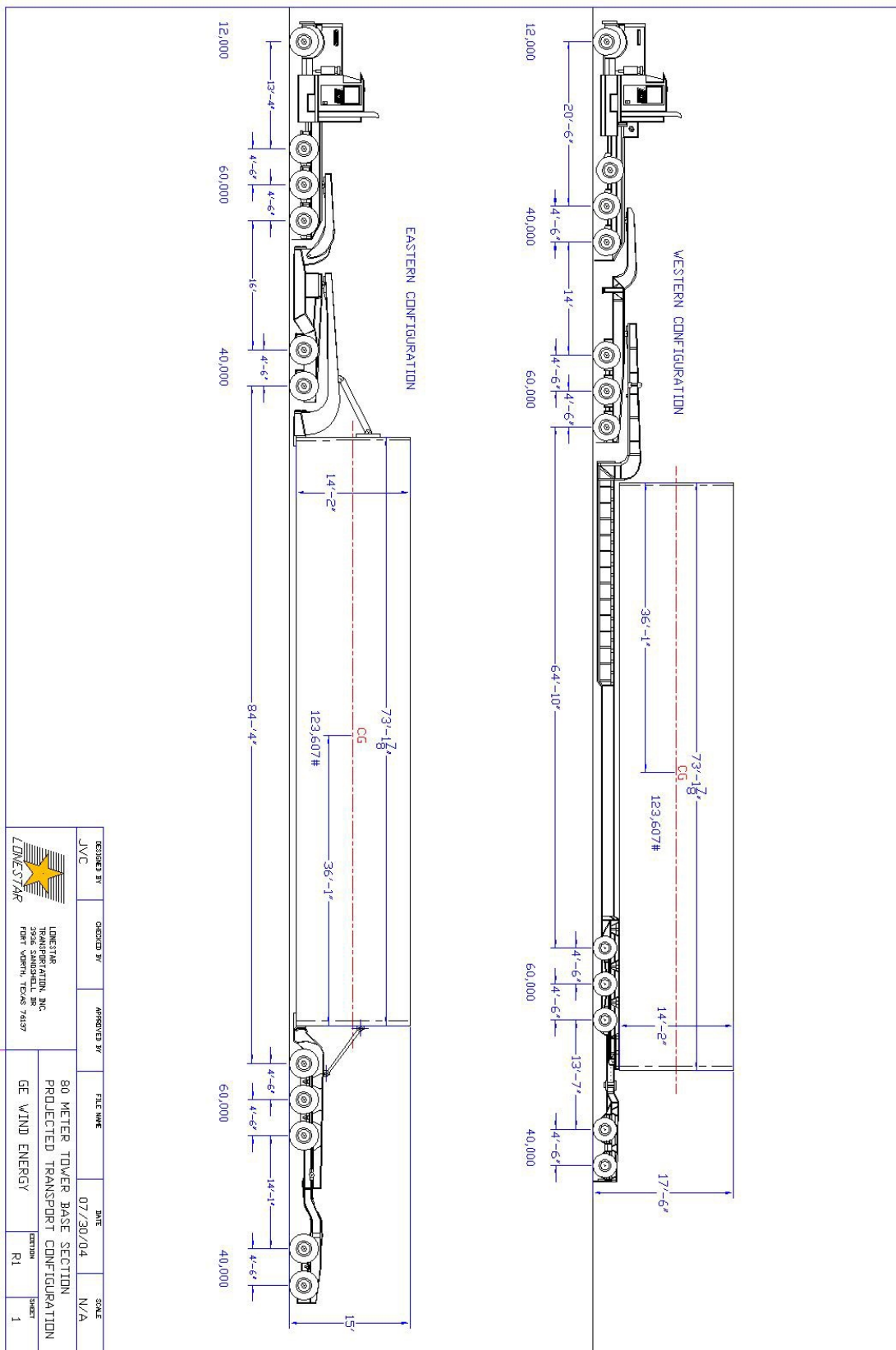


**D4- TRUCK AND TRAILER GENERAL SIZE FOR ROADS
AND DELIVERY**

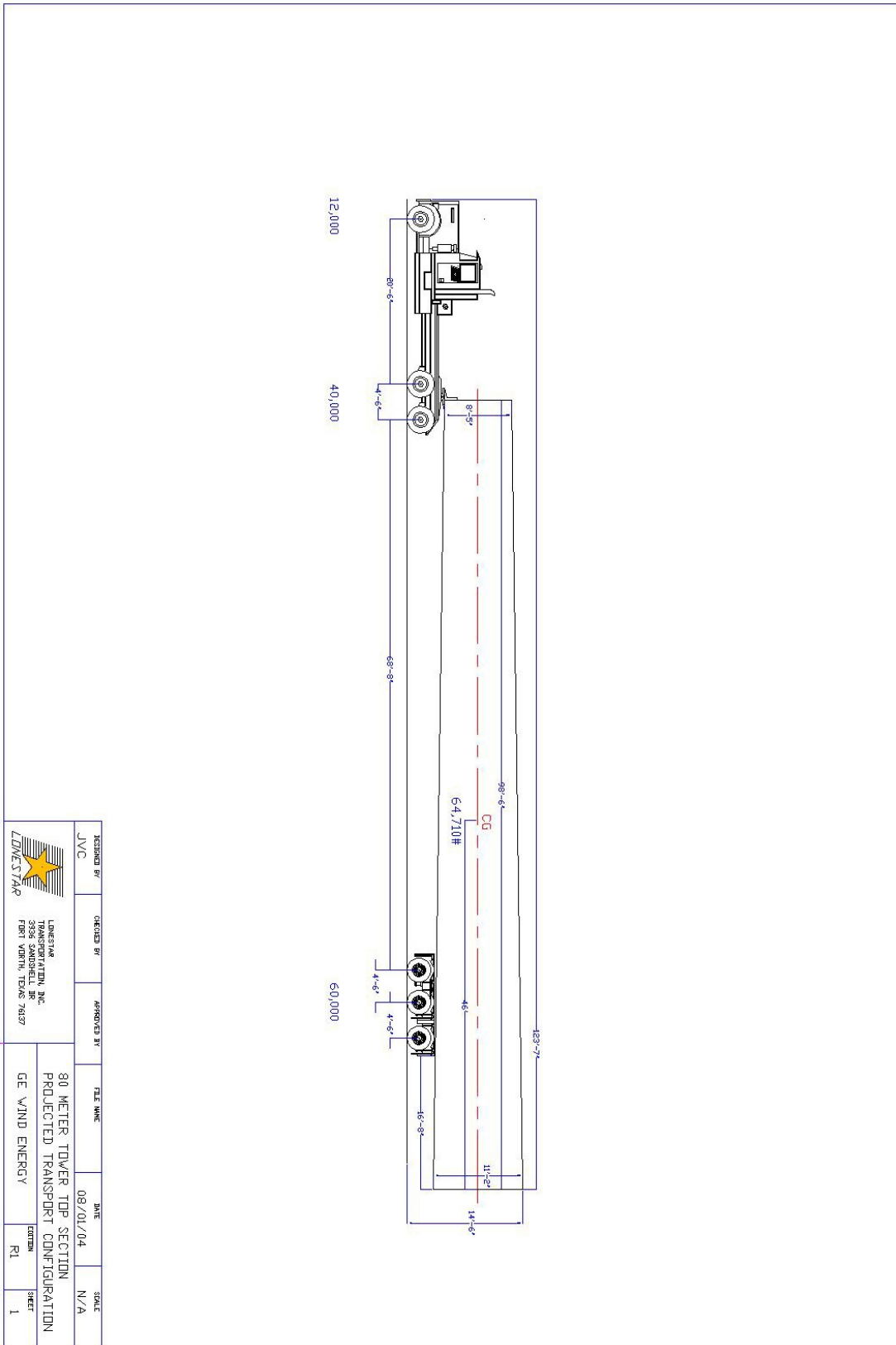


 LONESTAR TRANSPORTATION, INC. 7808 SHERIDAN BLVD FORT WORTH, TEXAS 76137	DESIGNED BY	CHECKED BY	APPROVED BY	FILE NAME	DATE	SCALE
	JVC			37 METER WIND BLADE TRANSPORT CONFIGURATION	03/23/04	N/A
				GE WIND ENERGY	REVISION	SHEET
					1	1

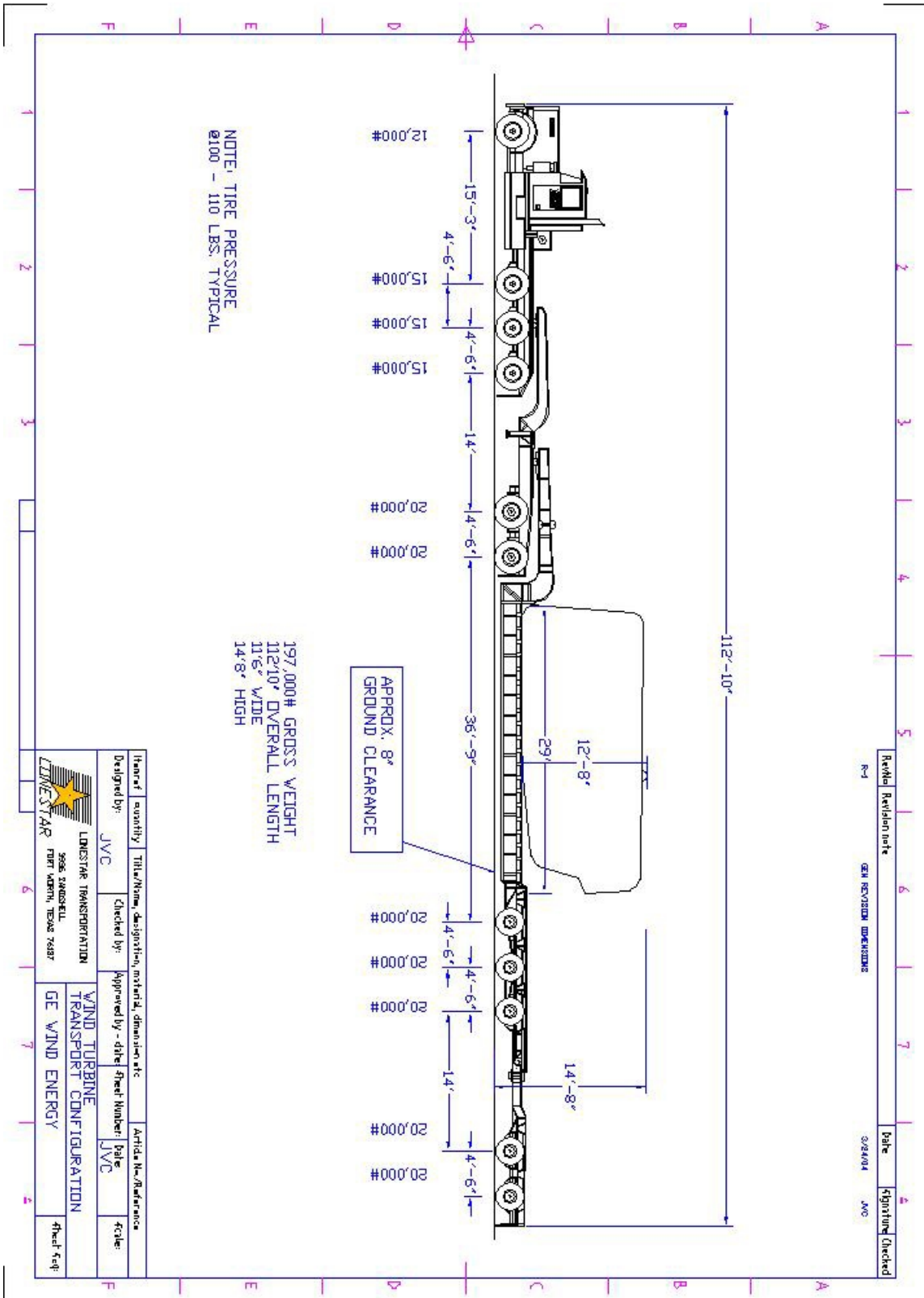
37 Meter Blade



80 Meter MTS Base



80 Meter MTS Top



Nacelle 11 Axel Lowboy

APPENDIX G SITE MAPS

APPENDIX H SAFETY MANAGEMENT PLAN

Safe Work Code



Safe Work Code RMSenergy Ltd.

Prepared by:

Reuben Burge
President

June 04, 2007
Rev.# 2007.001

RMSenergy Ltd.

796 Fraser Road, Westville, Nova Scotia Canada Tel (902) 771-0322 •

1.0 INTRODUCTION

Health and safety at RMSenergy Ltd. “RMSenergy” is managed and implemented in the spirit of the Occupational Health and Safety Act “OHS Act” in that management and staff are individually responsible for complying with the requirements of a safe and healthy work environment or what is often referred to as the internal responsibility system.

This Code exists to establish conditions which, combined with appropriate work practices and equipment, will provide a safe work environment. It is essential to observe both the principles of the Code and safe work practices.

This Code is designed to achieve a high level of safety. The consistent use of it will help prevent errors, omissions, and injuries by initiating effective communications, through a system of formal plans and procedures.

2.0 OCCUPATIONAL HEALTH & SAFETY POLICY

As required by the OHS Act, an occupational health and safety policy has been written and is reviewed annually and posted in the workplace. The current policy, August 24, 2007 is as follows:

“We at RMSenergy are committed to having our employees healthy and free from injury by maintaining a healthy and safe working environment. RMSenergy makes every reasonable effort to comply with occupational health and safety legislation, maintaining our equipment and facilities in safe condition, and insisting that staff at all levels understand and comply with the company’s safety procedures.

In implementing this policy, RMSenergy:

- strives to eliminate all foreseeable hazards which may be injurious to health or cause personal injury;
- provides safety equipment and training as necessary or desirable;
- makes every reasonable effort to comply with the Occupational Health and Safety Act of Nova Scotia, its regulations and other relevant legislation;
- makes every reasonable effort to ensure that the company safety procedures are understood, implemented and maintained.

Every one of us has an obligation to participate in implementing this policy by adhering to RMSenergy's safety procedures and doing everything possible to protect the health and safety of ourselves and our colleagues in the workplace."

3.0 GOALS

- **No Injuries, No Accidents, No Time Lost**
- **Safe Work Environment**
- **Employees Identify Potential Hazards and Implement Safe Work Practices**

4.0 RESPONSIBILITIES & RIGHTS

Manager/Supervisor Responsibilities

- **Ensure staff follow the Act and the Regulations**
- **Ensure staff work safely and use protective equipment**
- **Inform staff about known hazards**
- **Ensure appropriate hazard alerts are posted**
- **Take every precaution reasonable in the circumstances for the protection of the staff**
- **Provide training to staff on how to work safely**

Staff Responsibilities

- **Follow the Act and the Regulations**
- **Use protective equipment properly**
- **Report any hazard, dangerous situation**
- **Report all injuries to supervisors**
- **Use safety equipment properly**
- **Participate in safety training**
- **Always work safely**

It is the responsibility of the Project Managers to identify potential hazards of the projects they are responsible for and ensure proper safety precautions are implemented. This may involve developing a safety program for a project at the proposal stage, ensuring staff participates in on-site client safety programs and adherence to RMSenergy Safety Procedures and Job Safety Analysis requirements.

Employee Rights

- **The Right to Know about hazards in the workplace**
- **The Right to Participate in health and safety issues**
- **The Right to Refuse unsafe work**

5.0 DEFINITIONS

APPLICANT

That competent person(s) applying for a Permit to the Safety Officer to work on a specified device(s). The Applicant is responsible to ensure the application is complete and in accordance to the Safe Work Code.

APPROVED GROUNDING LOCATION

- a) An engineered grounding grid assembly installed and verified in accordance with relevant CSA and ANSI/IEEE and local power utility (NSPI) standards.
- b) A grounding grid assembly, or combination of overhead neutral or ground conductors which has been installed in accordance with relevant CSA and ANSI/IEEE and local power utility (NSPI) standards.

AUTHORIZATION

The process of receiving the appropriate approval for an Isolation Permit and/or Switching Procedure for the purposes of working on a specified device(s).

BYPASSING and PARALLELLING

Bypassing and Parallelling are processes by which a current loop is created. For example, when “Bypassing” a recloser the current loop is created by closing the bypass switch which set up a current loop through the recloser contacts and the bypass switch. For example, when “Parallelling” two feeders or reclosers, a current loop is created when the paralleling switch or device is closed.

COMPETENT PERSONS

Those persons who, by virtue of training, experience and certification, are knowledgeable of and competent in the application of the procedures defined in the Safe Work Code.

CONTROL CENTRE

That location which has control of the state (i.e. open or closed) of specified devices under the Safe Work Code by way of computerized, electronic, electrical/mechanical or manual operations.

DE-ENERGIZED

The state of being “shut-off”, blocked, or disconnected from a source of dynamic energy.

DYNAMIC ENERGY

A source of electrical, mechanical, or hydraulic energy having sufficient potential or capacity which is capable of operating any interconnected equipment within its normal operating parameters. Test equipment potentials and emergency generator installation are not considered sources of dynamic energy.

ENERGIZED

The state of being connected to a source of dynamic energy.

GROUNDING

The state of being connected to an “approved grounding location”.

GROUNDING PERSONNEL SHUNT

A high current carrying path established around an worker which is connected to an approved ground location.

ISSUANCE

In the context of the Safe Work Code, it is the granting permission to proceed with the actual work because the safety and security terms, as defined by the specific Permit have been met.

ISOLATION PERMIT

An isolation guarantee issued to a competent person under which specified work is authorized by the Safety Officer on specific apparatus.

PERMIT ISSUER

For the Lingan Wind Farm, the Safety Officer, will hand control of the device, or devices, stated on the Isolation Permit, over to the Permit Holder. The Permit Issuer/Safety Officer shall coordinate, direct and issue the Permit in accordance with the Standard Protection Code.

PERMIT HOLDER

A competent person who received an Isolation Permit from the Permit Issuer in accordance with the Safe Work Code.

PERSONAL SHUNT

A low resistance, high current carrying capacity path around a worker. This effectively reduces the available current which can flow through the worker's body.

POINT OF ISOLATION

That point which separates a work area or device from a source of dynamic energy.

PROTECTIVE DEVICES

An electrical or mechanical device which by its operation separates or disconnects the source of dynamic energy.

SAFE WORK CODE

A document establishing a systematic and coordinated approach to work planning to enhance personal safety and the protection of system equipment against damage.

SAFETY OFFICER

The contact person who is responsible for the safe and correct operation of electrical lines and equipment within a specified area. This responsibility includes, but is not limited to, the Permits and Switching procedures and the logging and placement of tags associated with devices under his/her jurisdiction.

SWITCHING PROCEDURE

A step-by-step plan used to ensure safe, secure and coordinated switching operations on a power system.

TAGS

A visual indicator attached to equipment to denote the presence of an abnormal state.

TERMINAL GROUND

A ground connection installed at an “approved grounding location(s)” which, by the application, ensures the operation of those protective devices which have been engineered to protect the isolated area(s) as stated in a Switching Procedure and Permit.

6.0 Permits

6.1 General

- A Permit is an isolation guarantee issued to a competent person under which specified work is authorized on specific apparatus.
- The issuance of a Permit shall be subject to the applicants acceptance of the terms and conditions of issuance.
- Permits shall be effective at the moment of issuance and shall cease to be effective at the moment of surrender. The Permit shall be continuous for the period between issuance and surrender.
- All Permits shall be self-sustaining, that is, affording their own isolation and not depending on the apparent isolation of some other Permit.
- Under no circumstances shall any Permit be deemed to provide isolation for anyone who is not authorized by the Permit Holder under their Permit.

- It shall be recognized as a basic principle that all parties issuing and receiving a Permit shall convey each to the other any and all information which might assist the others to intelligently carry out their work or which might influence their judgment, acts, or decision.
- A Permit must normally be surrendered to the person from whom it was received.
- A Permit must normally be surrendered by the Permit Holder.
- The Permit Holder and Safety Officer, must constantly maintain a means of communication while the work is in progress, unless other arrangements have been agreed upon between the Safety Officer/Permit Issuer and the Permit Holder.

6.2.1 Responsibilities of the Safety Officer

- The Safety Officer is responsible for the observance and enforcement of the Safe Work Code.
- The Safety Officer is responsible for the following:
 - approve the removal of apparatus from service
 - confirm the validity of the “points of isolation”,
 - in the event of a change of the Permit Holder, log the time and name of the replacement Permit Holder,
 - maintain a list of personnel competent to be “Permit Holders”, and those competent to “perform switching”.
- The Safety Officer in dealing with applications for Permits will consider:
 - the correctness and completeness of the information submitted with the application,
 - the impact of the removal of this apparatus from service on overall performance of the power system,
 - The suitability of the devices selected for the de-energization and safe isolation of the equipment.
- The Safety Officer on receipt of the Application shall refuse to grant a Permit for the following reasons:
 - the existence of a Permit, currently in progress, which includes devices identified in the permit application.
 - Refusal of the Application to conform with RMSenergy Ltd. rules and regulations,

- Undesirable operating conditions which would result from the apparatus outage,
- Use of non competent personnel.
- The Safety Officer will arrange to have authorized persons perform switching at the proper times and location.
- The Safety Officer is responsible to ensure tags are installed on one line diagram boards, SCADA systems and field devices.
- The Safety Officer shall coordinate, direct and issue the Permit in accordance with the Safe Work Code.
- The Safety Officer shall not authorize any personnel to approach the apparatus until the Permit has been issued and the terminal grounds, if required, have been applied.
- The Safety Officer shall be sure that every person acting under his/her instructions, or taking part in the preparation, issuance, or surrender of a Permit is competent and has carried out their part in accordance with the Safe Work Code.
- If the Safety Officer is not satisfied that all relevant conditions outlined in the Standard Protection Code have been met, then, the Permit shall not be issued.
- The Safety Officer shall furnish the Permit Holder and any other concerned person affected by the work with sufficient information about the nature of the work to be performed and the working conditions to enable them to judge whether the Permit is in order.
- The same person who issues a permit will be the one to whom it is surrendered.

6.2.2 Responsibilities of Permit Applicants

- The Permit Applicant is responsible to ensure the application is complete and in accordance to the Safe Work Code.
- All Permit applications shall be made to the Safety Officer.
- All Permit applications shall include the following information:
 - a switching procedure
 - nature of the work
 - identification of key personnel
 - duration of the work,
 - reason for the work,

- communications ID, path, phone numbers, etc.
- Permit Applicant shall:
 - furnish the Safety Officer with the complete information required with the application,
 - make the necessary arrangements with the Safety Officer and Permit Holder for providing a means of communication between all parties involved for the period during which the Permit is in effect.

6.4 Responsibilities of the Permit Holder

- The Permit Holder shall be responsible to ensure a safe work environment is maintained in accordance with the Safe Work Code and that all persons within the isolation points of the permit are made aware of any dangers or risks associated with the work to be performed. For complicated jobs or remote work sites, the Permit Holder may designate a person to be their representative at a designated site.
- If the Permit Holder is not satisfied that all relevant conditions outlined in the Safe Work Code have been met, then, the permit should not be accepted by the Permit Holder. (this is somewhat illogical since the Permit holder is the originator or author of the permit in the first instance so he/she should be certain of the nature of the work at the outset)
- In addition to carefully observing the Safety Rules and Operating Procedures, the Permit Holder shall:
 - take out no more Permits than can be safely supervised,
 - have no more crews working under his/her Permit than he/she can safely supervise,
 - prohibit work during his/her absence unless their responsibilities have been transferred to a competent person,
 - place any additional guards and warnings which are desired to clearly indicate the safe work space.
- The Permit Holder shall give clear instructions to the work crews(s) regarding:
 - all apparatus on which work is authorized,
 - any neighboring apparatus which is “energized”,
 - the safeguards provided against neighboring “energized” apparatus and the precautions necessary when working near “energized” apparatus,
 - the points of “isolation” and “terminal grounding”,

- the danger of sectionalizing the apparatus covered, thereby cutting off the influence of required grounding devices.
- Where work can be safely performed over a large area under one Permit, the Permit Holder may delegate their responsibilities to a designated person at a remote site. On acceptance, this designated person working under the direction of the Permit Holder, is responsible to ensure that all relevant conditions of the Safe Work Code are met at the remote site.
- Should operating conditions make it necessary, the Safety Officer may request that a Permit be surrendered. The Permit Holder shall be responsible to surrender the permit as soon as practicable.
- Before leaving the work site, the Permit Holder or designate must notify the Safety Officer to advise of their whereabouts and the conditions of the apparatus.
- If the work has been interrupted, or if the work is to be continued on another day, the Permit Holder must always report to the Safety Officer before resuming work. The work crew(s) shall not commence work until instructed to do so by the Permit Holder.
- Should the Safety Officer and Permit Holder mutually agree that no conditions could exist which could present a hazard to the workers, the public, or the system, the requirements of 5.6 and 5.7 may be deemed unnecessary.

6.5 Transfer of Responsibilities of Permit Holders

- The transfer of the responsibilities of the Permit Holder may occur only when another competent person agrees to perform the responsibilities of the Permit Holder at all times.
- If for some reason, the Permit Holder must leave the work site, he/she may transfer their responsibilities to a competent person. To make this transfer of responsibilities, the original Permit Holder shall:
 - arrange for replacement by another competent Permit Holder,
 - explain all details of the Permit to the individual who is to act on his/her behalf,
 - advise the Safety Officer of this change and expected duration (who will log the time, date, and name of the replacement)
 - advise the Work Crew of the change.
- To make a transfer of responsibilities, when the original Permit Holder is not available, the original Permit Holder's supervisor and the Safety Officer in conjunction with the work crew(s) may make a transfer request. In this case

the original Permit Holder's supervisor acts as the temporary Permit Holder until the transfer is completed. When the original Permit Holder returns, the supervisor must review all changes and updates with the original Permit Holder before they return to the work site.

6.6 Responsibilities of Work Crews and Others

- The work crew shall not commence work until instructed to do so by the Permit Holder.
- If the work has been interrupted, or if the work is to be continued on another day, the work crew shall not commence work, or continue existing work until instructed to do so by the Permit Holder.
- Each member of the work crew is expected to fully understand his/her responsibilities as required by the Safe Work Code. If his/her responsibilities are not clear, he/she shall seek clarification from the Permit Holder.
- Should any member of the work crew become aware of any condition which could compromise his/her personal safety, the safety of others, or system security, they are to immediately advise the Permit Holder or their designate of this condition.
- Work crew member(s) installing a personal shunt(s) shall, at the time of installation, notify the Permit holder or his/her designate as to the presence and location of the personal shunt.
- Work crew member(s), having installed a personal shunt(s) shall, after the completion of work, be responsible to remove the personal shunt(s) and notify the Permit Holder or his/her designate that the personal shunt(s) is not clear of the primary equipment.

6.7 Permit Issuance

6.7.1 Local

The Safety Officer will as required:

- a) check that all switching personnel are in position as requested,
- b) carry out the switching plan, de-energizing and isolating the apparatus covered by the application,
- b) confirm that "terminal" grounding, if required, and other field protective devices are tagged, tags placed in position on the appropriate One Line Diagram Boards, SCADA, and other control systems,

The Safety Officer will then:

- a) proceed to complete the Permit
- b) confirm “terminal” grounding, if required, and other protective devices are in place as specified,
- c) have the Permit signed by the Permit Holder, who will retain the original,
- d) retain a copy of the Permit,
- e) note the time the Permit was issued,
- f) advise the Permit Holder to proceed with the work.

6.7.2 Remote

All of the forgoing rules for issuing Permits apply to this case, except that the Permit Holder will not be able to personally sign the Permit Form held by the Permit Issuer.

Once the procedure for issuing the Permits has advanced to the stage where the Permit Issuer is satisfied that all is in readiness and is in communication with the prospective Permit Holder, the Permit Issuer will proceed as follows:

- a) the Safety Officer will complete the Permit Form,
- b) contact the Permit Holder and convey the information so that the Permit Holder will have a complete and identical Permit Form,
- c) the Permit Holder will repeat the information entered on their Permit Form back to the Safety Officer as a verification, and if satisfied in all respects, will sign the form at the work site,
- d) the Safety Officer, on being advised that the Permit Form at the work site has been signed, will print the name of the Permit Holder on their Permit Form, noting that the transaction was verbal and the time.
- e) The Safety Officer will then advise the Permit Holder to proceed with the work.

7.0 SURRENDERING THE PERMIT

7.1 Local

The Permit Holder shall surrender the Permit as soon as possible after completion of the work.

Before surrendering a Permit, the Permit Holder shall inspect the apparatus covered by the Permit and instruct every member of the work crew and any Supervisor working under the Permit that:

- a) the Permit is going to be surrendered,
- b) all personnel must be clear and stay clear of the apparatus,
- c) all grounds that were placed on the apparatus for personal protection are to be removed,
- d) the isolation for work is ended and the apparatus covered by the Permit is to be treated as “energized”.

Upon completion of the forgoing, the Permit Holder shall:

- a) give the Safety Officer a statement outlining the work completed,
- b) surrender the Permit to the Safety Officer, having both the Permit Holder’s and Safety Officer’s copy in the appropriate space.
- c)

7.2 Remote

The previous rules for surrendering Permits apply to this case, except that the Permit Holder will not be able to personally sign the Permit held by the Safety Officer.

When the work has been completed, and the Permit Holder is satisfied that all is in readiness to surrender the Permit, and is in communication with the Safety Officer, the following events shall occur:

- a) the Permit Holder will sign, in the appropriate space, the Permit form held at the work site and then advise the Safety Officer that this has been done,
- b) the Safety Officer will print the Permit Holder’s name in the proper space, noting that the transaction was verbal and the time,
- c) the Safety Officer will then proceed as with the normal steps for surrendering the Permit, and will so advise the former Permit Holder.

8.0 RETURNING APPARATUS TO OPERATING CONDITIONS

On the surrender of a Permit, the Safety Officer will:

- a) note the time it was surrendered,

- b) ensure that all tags concerned are removed, and carry out the “return” switching plan as previously arranged,
- c) ensure terminal grounding if applied has been removed,
- d) verify completion and ability of equipment to resume normal operating condition.

The Safety Officer will release all switching personnel.

SAMPLE ISOLATION PERMIT

Permit Number: _____

Issued to: _____ at: _____ Hrs.

On: _____, 20____.

FOR WORK ON:

POINTS OF ISOLATION:

LOCATION OF TERMINAL GROUNDING:

WORK TO BE PERFORMED:

Expects to be clear by: _____

Issued with approval of: _____

Permit Issued by: _____

Permit Holder: _____

Permit Surrendered by: _____

On: _____ 20_____.

Permit Received by: _____

This card is your authority to work on the apparatus referred to between the limiting points as outlined, and is applicable to that apparatus only. It is also assurance that said apparatus has been de-energized and isolated. The necessary safeguards for your protection have been taken and as far as operation is concerned, "ISOLATION PERMIT, DO NOT OPERATE" tags have been placed at all controlling points.

The above assurance, however, does not relieve you of the responsibility of taking any additional precautions which you may consider necessary for the protection of yourself and the personnel in your charge.

9.0 ISOLATION OF EQUIPMENT

9.1 Electrical Devices

Electrical devices used as isolating apparatus to conduct work under terms of a permit shall:

- a) whenever practical, provide visible separation which can be positively determined by inspection of each phase contact assembly;
or
- b) in the case where isolation is dependent on electrical devices with concealed contacts, then this isolation shall be verified by the use of an approved potential test indicator on each phase assembly and the application of “terminal grounds” prior to the issuance of the permit.

Approved isolating devices shall consist of one of the following:

- a) electrically or mechanically operated switches,
- b) approved equipment which allows for the disconnection and removal of fusible elements or bus links,
- c) cable elbows which can be disconnected from other electrical apparatus so as to provide a positive visible separation,
- d) “jumpers” which when removed establish a physical air gap equivalent in distance with those safety standards referred to as the “absolute limits of approach”,
- e) single element or multiple disc type insulator arrangements approved for use on GBLWP system,
- f) draw out style breakers in which the breaker may be positioned such that a separation between the bus and the breaker contact assemblies may be visible and, if equipped, allow port shutters to close.

9.2 Blocking of an Isolation Device

When an electrically, mechanically, hydraulically, or pneumatically operated device is used as a point of isolation pertaining to a Permit, operation of the device shall be prevented by:

- a) locking or blocking the device in the required position,

- b) removal of the energy supply which operates the device, i.e. disconnection of the electrical supply, closing of valves, unloading or discharging the stored energy of springs, etc.
- c) separation or removal of a portion of the operating mechanism, i.e. separation of gear train assemblies or operating linkages, withdrawal or the removal of approved insulated switchsticks,
- d) any or all of the proceeding steps which achieve the purpose of preventing the operation of the device.

10.0 TEMPORARY GROUNDING

10.1 General

These policies have been developed to provide a safe environment for workers when working on isolated lines and/or equipment. Protection for the employee is achieved by the utilization of the equipotential principle. These policies take into consideration the available fault current levels, parallel lines, and return current path resistance to power sources.

These grounding policies shall apply to all voltage classes employed by RMSenergy for the transmission of electrical energy.

10.2 Equipotential Principle

The equipotential principle provides the worker with maximum “personal” protection under any condition that could produce a potential difference in the work area. The worker is fully protected by being within the equipotential work area. This equipotential work area is established by providing a low resistance, high current carrying capacity path (personal shunt) around the worker. This effectively reduces the available current which can flow through the worker’s body.

10.3 Terminal Grounds

“Terminal ground(s)” shall be installed at approved grounding location(s) which by their application provide a current path to ensure the operation of protective devices. The following conditions shall apply to the application of “terminal grounds”.

Where “terminal grounds” are required, a minimum of one (1) terminal ground shall be installed at an “approved grounding location”.

An approved RMSenergy grounding location shall be:

- a) an engineered grounding grid assembly installed and verified by qualified personnel

or

- b) a grounding grid assembly, or combination of overhead neutral or ground conductors which has been installed, certified, and approved for use.

The placement, removal, and location of any terminal ground shall be clearly indicated on the approved switching procedure.

10.4 Procedures

Whenever work is to proceed under the terms of a permit, a zone of personal protection shall be established prior to the commencement of the work.

Where work is to be performed on electrical equipment which:

- a) forms all or part of a four (4) wire multi-grounded system,

or

- b) lies within the bounds of a substation, switching station, or tap point, where an engineered grounding grid exists. The zone of personal protection shall be established by the use of a “personal shunt”.

Where work is to be performed on other electrical systems, the zone of personal protection shall be established by the use of a “personal shunt” and “terminal grounding”.

11.0 SWITCHING PROCEDURES

11.1 General

The switching procedure is a step-by-step plan used to ensure safe, secure and coordinated switching operations on the power system.

A switching procedure shall be utilized whenever:

- a) the intended work involves:
 - i) bypassing / paralleling on the electric power system

- ii) separation of interconnected, paralleled, or looped distribution feeders or transmission circuits,
 - iii) commissioning and/or testing equipment,
 - iv) the issuance of a Permit.
- b) specified as a requirement by RMSenergy Ltd. approved practice.

NOTE: Under emergency condition, the use of an approved switching procedure may be omitted; however, the steps taken shall be limited to those necessary to safeguard life or limit equipment damage.

The switching procedure writer/initiator shall ensure the steps of the procedure meet the intended purpose and are compatible with existing field conditions.

12.2 Switching Procedure Form

The following definitions apply to the Switching Procedure document:

PURPOSE: A brief statement to explain the nature and scope of the work.

ORIGINATED BY: The Switching Procedure writer/initiator. The originator is responsible for obtaining the necessary approval of the procedure.

COMMUNICATION REQUIREMENTS: Indicates the frequency/channel or any special communication requirements/arrangements to be used during execution of the procedure.

FIELD REVIEW: Additional field review of the procedure to ensure the procedure meets the intended purpose and is compatible with existing field conditions.

AUTHORIZED BY: The signature of the Safety Officer approving the procedure.

NO./REV.: The unique procedure number shall be entered in the upper right-hand corner. If revised, a revision letter will be added.

PERFORMED BY: Indicates the group or individual to execute that particular step.

DIRECTED BY: Indicates the individual or Safety Officer responsible to initiate and confirm the completion of each step.

OPERATION: The switching act performed on the device.

DEVICE: The system device number, line, etc.

REMARKS: Additional remarks relative to the switching operation – Lock, Block, Tag, etc.

12.3 Procedure Preparation

Whenever practical, a single switching procedure shall be prepared to remove and then return equipment to normal service.

Switching procedures shall be arranged in a logical, sequential manner. The arrangement of steps shall address the processes necessary to de-energize, isolate, ground, issue permit, cancel permits, remove grounds, reconnect, and re-energize equipment.

Each switching step shall be limited in scope to describing a single switching operation (i.e. open, close, etc.) and shall make reference to only a single device. Additional remarks indicating the requirement to secure (lock, block, etc.) or tag a device shall accompany the switching step and be considered as forming part of the single switching instructions.

Where a single procedure cannot adequately encompass the steps necessary to describe a complete project, the procedure originator shall ensure each inter-related procedure stands on its own by the inclusion of “confirm” steps within the procedure. These “confirm” steps shall clearly identify any abnormal operating condition or execution/timing conflicts which must be considered prior to the execution of the intended procedure.

Confirmation or “confirm” steps shall be incorporated into a switching procedure whenever:

- i. during the course of the procedure, the position of a device may have been altered by testing or maintenance-related activities;
- ii. points of isolation, established by other permits or procedures, are to be shared by permits issued as part of the current procedure;

- iii. notification of a unique operating condition or timing/execution priority must be established within the current procedure or between other inter-related procedures.

Notes shall be added to the procedure whenever it becomes necessary to bring attention to or give further explanation to a specific switching arrangement. For example, when a group of switching steps are to be performed in a simultaneous manner.

12.4 Approval/Routing

All procedures shall be submitted to the appropriate Safety Officer for approval. The Safety Officer shall then assign to the procedure, a unique file number (i.e. procedure number) and return this number to the procedure originator. The number applied shall be of a consistent nomenclature.

Should the procedure require revision, a revision letter (i.e. A,B,C...etc.) or a new numbers shall be applied to the procedure by the Safety Officer and then returned to the originator. Once revised, the procedure shall be forwarded to the Safety Officer for further review.

12.5 Execution

Switching procedures shall normally be executed in a sequential step-by-step manner. Steps involving the operation of energized equipment shall be confirmed (as to the proper operation of the device) prior to the commencement of the next switching step.

Deviations to the order in which the approved steps are executed shall require the agreement of both the individual directing the switching operation and the Safety Officer.

NOTE: Careful consideration and attention to detail must always precede any change from the approved switching sequence.

SWITCHING PROCEDURE

PURPOSE: TO ISOLATE ...

Originated by: _____

Field Review: _____

Authorized by: _____

Directed by: _____

Communication Requirements: _____

Date to be carried out: _____

Time to begin switching: _____

Copies to:

13.0 TAGGING

13.1 General

“DO NOT OPERATE” tags are visual indicators attached to equipment to denote the presence of an abnormal state. This abnormal state may be created as the result of an equipment malfunction or to emphasize the presence of field personnel performing work on or around equipment.

WHEN CONFRONTED BY A TAG, DO NOT OPERATE THE TAGGED DEVICE UNTIL AUTHORIZATION TO DO SO HAS FIRST BEEN RECEIVED FROM THE SAFETY OFFICER. It is the responsibility of the Safety Officer to receive authorization from the individual who has requested the tag before any action is taken.

Personnel installing “Do Not Operate” tags shall ensure that all information required on the reverse side of a tag is provided at the time the tag is installed.

The Safety Officer shall be responsible to record and track the presence of all tags affixed to equipment operating under its jurisdiction.

13.2 Description of Tags

9.2.1 Isolation Permit Tag

Coloured with solid red.

Front The tag bears the text: “Isolation Permit Do Not Operate”.

Back Permit Number: (specified Permit number supplied by the Safety Officer).

Tagging Request By: (Name of the Permit Holder if tag personally installed by the Permit Holder, otherwise the position of Safety Officer representative requesting the tag be installed.

Date/Time: (Date/Time at which tag is installed.)

Installed by: (Name of individual installing tag.)

13.2.2 Out of Order Tag

Coloured with solid blue.

Front The tag bears the text “Out of Order Do Not Operate”.

Back Installed on: (Device number on which tag is installed).

Date/Time: (Date/Time of installation).

Reason: (Reason equipment is out of order).

Installed by: (Name of individual installing tag).

13.2.3 Caution Tag

Coloured with solid yellow.

Front The tag bears the text “Caution, Do Not Operate Without Proper Authority, Conditions Abnormal”.

Back Installed on: (Device number on which tag is installed).

Date/Time: (Date/Time of installation).

Reason: (Description of the abnormal condition) or restrictions pertaining to the device.

Installed by: (Name of individual installing tag).

13.3 Use of Tags

13.3.1 Isolation Permit Tag

The “Isolation Permit” tag shall be used whenever points of isolation or terminal grounding devices are specified to be tagged in accordance with the requirements of a Permit. The “Isolation Permit” tag shall be used whenever the position of a device must be guaranteed and not altered during the course of a specific work function.

13.3.2 Out of Order or Caution Tags

“Out of Order” or “Caution” tags shall be used to visually identify those devices which may be in or out of service but cannot be operated. The Control Authority shall be notified when and for what reasons an “Out of Order” or “Caution” tag has been affixed to a field device. Out of Order or Caution tags shall be installed by personnel knowledgeable in the use of these “Do Not Operate” tags.

13.4 Placement of Isolation Permit Tags

NOTE: All tags shall be fastened in a secure fashion and conspicuous location.

13.4.1 Isolation Permit Tags

“Isolation Permit” tags shall be affixed to field devices, in accordance with the instructions of an approved switching procedure, normally at the time the applicable switching step is performed. “Isolation Permit” tags shall be installed by:

- (i) individuals authorized and competent to perform switching,
- (ii) other personnel working under the direction of personnel authorized and competent to perform switching.

13.4.2 Supervisory Control Points and One-Line Diagram Boards

“Isolation Permit” tags shall be applied and removed in accordance with the instructions of an approved switching procedure, at the time the applicable switching step is performed.

13.4.3 3-phase Manually Operated Disconnect or Grounding Switches

Tags shall be secured to the mechanical locking assembly associated with the switch operating mechanism.

13.4.4 1-phase Hook Stick Operated Disconnect Switches

Tags shall not normally be applied to single phase hook stick switches unless required by an approved Operating Practice.

13.4.5 3-phase Motorized Disconnect Switches

Tags shall be secured to both the switch mechanical locking assembly (similar to manually operated switches) and the 89CS (open/close) control switch located in the substation control building.

13.4.6 Circuit Breaker / Reclosers

Circuit breakers or reclosers shall not normally be tagged under the terms of a Permit. In cases where the position of the circuit breaker or recloser must be guaranteed, a tag shall be placed on the breaker's 52CS control switch, located within the substation control building, or within the recloser's control box.

NOTE: The operation of a circuit breaker or recloser (trip or close function) shall be blocked when a circuit breaker or recloser is tagged.

13.4.7 Portable Grounding Equipment

Tags shall be affixed to portable grounding equipment whenever it is necessary to identify the purpose for their placement and the specific individual or work crew for whom the grounding equipment was installed.

13.5 Removal of Tags

Under no circumstances shall a tag be removed before authorization has been received from the person requesting the tag.

Tags shall normally be removed in accordance with the instructions of an approved switching procedure.

14.0 COMMUNICATIONS

14.1 General

Communications are an essential component in the successful and safe completion of work performed under the guidelines of the Safe Work Code. A variety of options is available for use such as the telephone (land line and cellular) or direct voice.

The preferred mode of communications is identified in the following sections. In cases where alternative communication routes are utilized, all parties are to be in agreement prior to their use.

Clear and precise communications are very important in minimizing risk. All instructions are to be repeated back for confirmation to the originator of the message, who will verify/confirm that the message has been correctly received. Use of the international phonetic alphabet is expected where appropriate.

Phone communications (cellular, land line) are the preferred means of communication unless direct voice is easily feasible.

While a Permit is in effect, the Permit Holder shall maintain a means of communication with the Safety Officer unless alternate arrangements have been mutually agreed upon.

15.0 EMERGENCY CONDITIONS

15.1 General

In emergency situations, a competent person may perform such operations as are necessary to provide the protection required to ensure the safety of personnel or to limit damage to equipment. Workers shall act according to their best judgment. Under such circumstances, when quick action is necessary in order to safeguard life or property, all workers are authorized to perform any operation **WHICH THEY THOROUGHLY UNDERSTAND.** Under no circumstances are they to perform any operations about which they are in doubt.

These actions are restricted to only those necessary to allay the emergency conditions as outlined above. All further actions shall be conducted in accordance with normal procedures.

An accurate record of all operations performed under these conditions must be kept and reported to the Safety Officer as soon as possible after the occurrence.

16.0 TRAINING

Health and safety training provides mandatory training and workplace hazard specific training.

Mandatory Training

- New Employee and Part-time Employee Orientation
- WHMIS
- Emergency Evacuation

Workplace Hazard Training as Required

- First Aid
- Transportation of Dangerous Goods
- Fall Protection
- Personal Protective Equipment
- Respirator Fit Tests and Training
- Client On-Site Training
- Supervisor/Manager Responsibilities

17.0 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Respirators, hard hats, safety boots, eye protection and hearing protection are provided by RMSenergy. Coveralls and gloves are also available. If other personal protective equipment (PPE), such as full-face respirators, fall protection harnesses or self-contained breathing apparatus are required because of specific project hazards, the proper equipment and PPE training will be provided.

It is the responsibility of the project manager / supervisor and the employee to determine the need for PPE and that it is selected and used properly.

18.0 DRUG AND ALCOHOL POLICY

In addition to industrial workplace hazards RMSenergy has a policy to provide a workplace that is free of illegal drugs or the improper use of legal drugs or alcohol.

**APPENDIX L ENVIRONMENTAL PROTECTION
PROGRAM**

**APPENDIX M ENVIRONMENTAL MANAGEMENT
PROGRAM**