

EP 01 00 00 05 SP

**33KV OUTDOOR DEAD TANK
CIRCUIT BREAKER ASSEMBLY**

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Document control

Version	Date	Summary of change
1.0	November 2010	First issue
1.1	November 2012	Add Appendix D - Requirements for Technical Aspects of Tender Evaluation

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1 Scope and Application

This document identifies minimum compliance specifications for 33kV outdoor dead tank circuit-breakers designed for installation on RailCorp systems and operating at nominal 33kV a.c., three-phase, 50 Hz.

The scope of supply shall include design, manufacture, assembly, testing at manufacturer's works; packaging, shipping and delivery to RailCorp as specified.

The scope includes all accessories and equipment necessary and usually supplied for safe operation of the equipment, whether directly specified or not. The requirement is for self contained outdoor circuit-breakers complete with mechanism box and support structure.

The requirements of this document apply when a new 33kV outdoor dead tank circuit-breaker is to be installed in a new outdoor substation/switchyard or when an old dead tank circuit-breaker is replaced in an existing substation/switchyard.

The 33kV outdoor dead tank circuit-breaker assembly covered by this specification shall provide:

- a 33kV dead tank outdoor circuit-breaker
- current transformers incorporated in the circuit breaker
- a fully functional operating mechanism box
- a fully integrated steel structure of adequate strength suitable to mount the circuit-breaker and mechanism box

2 Applicable Standards

The following Standards are either referenced in this document or can provide further information.

2.1 International Standards

<i>IEC 61958:2000</i>	<i>High-voltage prefabricated switchgear and control gear assemblies - Voltage presence indicating systems</i>
<i>IEC 60051-1:1997</i>	<i>Direct acting indication analogue electrical measuring instruments and their accessories Part 1: Definitions and general requirement common to all parts</i>
<i>IEC 60051-7:1984</i>	<i>Direct acting indicating analogue electrical measuring instruments and their accessories Part 7: Special requirements for multi-function instruments</i>

2.2 Australian Standards

<i>AS ISO 1000:1998</i>	<i>The international system of units</i>
<i>AS 1852.441:1985</i>	<i>International electrotechnical vocabulary – Switchgear, controlgear and fuses</i>
<i>AS/NZS 1052:1992</i>	<i>CISPR specification for radio interference measuring apparatus and measurement methods</i>
<i>AS 1566:1997</i>	<i>Copper and copper alloys – Rolled flat products</i>
<i>AS 1675:1986</i>	<i>(obsolescent) Current transformers – Measurement and protection (obsolescent)</i>

AS 1734:1997	<i>Aluminium and aluminium alloys – Flat sheet, coiled sheet and plate</i>
AS 2067:2008	<i>Substations and high voltage installations exceeding 1kV a.c.</i>
AS 2650:2005	<i>Common specifications for high-voltage switchgear and controlgear standards</i>
AS 2700S:1996	<i>Colour Standards for general purposes</i>
AS 4398.1:1996(R2010)	<i>Insulators – Ceramic or glass – Station post for indoor and outdoor use – Voltages greater than 1000 V a.c. - Characteristics</i>
AS 4680:2006	<i>Hot-dip galvanized (zinc) coatings on fabricated ferrous articles</i>
AS/NZS 60137:2008	<i>Insulated bushings for alternating voltages above 1000 V</i>
AS 60529:2004	<i>Degrees of protection provided by enclosures (IP Code)</i>
AS 62271–100:2008	<i>High-voltage switchgear and control gear - High-voltage alternating-current circuit-breakers</i>
AS 62271–200:2005	<i>High-voltage switchgear and control gear - A.C. metal-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV</i>
AS 62271–201:2008	<i>High-voltage switchgear and control gear - A.C. insulation-enclosed switchgear and control gear for rated voltages above 1 kV and up to and including 52 kV</i>
AS 62217:2007	<i>Polymeric insulators for indoor and outdoor use with a nominal voltage > 1000V – General dimensions, test methods and acceptance criteria</i>
AS 60044.1:2007	<i>Instrument transformers – Current transformers (IEC 60044-1 Ed.1.1 (2003) MOD)</i>
AS 62271.301:2005	<i>High voltage switchgear and controlgear – Dimensional standardization of terminals</i>

2.3 RailCorp Standards

EP 00 00 00 12 SP	<i>Electrical Power Equipment – Integrated Support Requirements</i>
EP 00 00 00 13 SP	<i>Electrical Power Equipment – Design Ranges of Ambient Conditions</i>
EP 00 00 00 15 SP	<i>Common Requirements for Electric Power Equipment</i>
EP 03 02 00 01 SP	<i>Controls & Protection for Rectification Equipment</i>
EP 19 00 00 02 SP	<i>Protection System Requirements for the High Voltage Network</i>
EP 21 00 00 01 SP	<i>Insulation Coordination and Surge Arrester Selection</i>
EP 90 10 00 02 SP	<i>Standard Voltage Tolerances</i>

3 Definitions and Abbreviations

For the purpose of this specification, the terms, definitions and abbreviated terms in AS 1852.441 and the following apply.

Circuit-breaker A mechanical switching device that is capable of making, carrying and breaking currents under normal circuit conditions, and also of making, carrying for a specified time and breaking currents under specified abnormal conditions, such as those of a short-circuit.

Dead tank circuit-breaker A circuit-breaker with interrupters in an earthed metal tank.

Fixed circuit-breaker A circuit-breaker which is not a withdrawable part of the panel assembly in which it is mounted.

Rated insulation level The combination of the rated lightning impulse withstand voltage and the rated short duration power frequency withstand voltage specified in AS 2650.

Rated normal current For main circuits and switching devices, the r.m.s. value of the current that they are designed to carry continuously under the specified conditions of use and behaviour.

Rated peak withstand current For main and earthing circuits, the peak current associated with the first major loop of the short-time withstand current that a mechanical switching device is designed to carry in the closed position under prescribed conditions of use and behaviour.

Rated short-time withstand current For main and earthing circuits, the r.m.s. value of current that the switching device is designed to carry in the closed position during a specified short time under prescribed conditions of use and behaviour.

Rated voltage The highest r.m.s. phase-to-phase voltage of the supply on which the switchgear is designed to operate.

Switch A mechanical switching device that is capable of making, carrying and breaking currents under normal circuit conditions, which can include specified operating overload conditions, and also capable of carrying for a specified time, currents under specified abnormal circuit conditions such as those of a short-circuit.

4 Performance Characteristics

4.1 General

The circuit-breakers shall be designed and manufactured in accordance with AS 2650 – *Common Specifications for High Voltage Switchgear and Controlgear* and the series AS 62271 – *High Voltage Switchgear and Controlgear* except where specifically varied in this document.

Circuit-breakers manufactured in accordance with other internationally recognised standards (such as ANSI/IEEE) may be acceptable to RailCorp provided the circuit-breakers meet the essential performance criteria as specified herein.

The circuit-breakers shall be suitable for the environmental conditions as described in RailCorp document: *EP 00 00 00 13 SP, Electrical Power Equipment – Design Ranges of Ambient Conditions*.

Similar components of all equipment shall be capable of being interchanged.

4.2 Circuit-breaker Ratings

The circuit-breaker shall have the following general ratings:

Item	Description
Type	Dead Tank
<i>System Parameters:</i> Nominal system voltage Rated voltage (U_r) Rated frequency (f_r) No. of phases No. of poles Class	33 kV 36 kV 50 Hz 3 3 Outdoor
Interrupting medium	SF6 or Vacuum
Rated insulation level: Lightning impulse withstand voltage (U_p) Power frequency withstand voltage (U_d , kV for 1min.)	200 kVp 70 kV
Rated normal current (I_r)	1250 A
Rated short circuit breaking current	25 kA
Rated short circuit making current	62.5 kAp
First pole to clear factor	1.5
Rated operating sequence	O-0.3s-CO-3min-CO
Rated duration of short circuit (t_k)	3 s
Mechanical endurance (class) No. of on/off operations at no load	M2 10,000
Electrical endurance (class) Minimum number of break operations: At rated current At 20 kA At 25 kA	E2 2000 20 10
Minimum heights and clearances as per AS 2067:2008	
Operating mechanism: Method of operation Operating mechanism type Spring charging motor	Power Spring
No. of independently operating trip coils	2
No. of independently operating close coils	1
Supply voltage for trip/close coils	125 V d.c. +10%, -30%
Supply voltage for space heaters	240V a.c. 50Hz
Insulators Total minimum creepage Colour Material	Heavy (IEC 608150) Grey Porcelain or silicon rubber

4.3 Technical Requirements

4.3.1 General

The circuit-breaker supplied under this specification shall be 'dead tank' circuit-breaker units. The circuit breakers shall be suitable for use in a 33kV system that consists of both HV aerial lines and cables.

All equipment shall be designed to minimise safety hazard to operating personnel, prevent accidental "shorts" by human error and prevent access of spiders, birds or rodents.

The design and construction shall be in accordance with the technical requirements stated. All materials shall be of a type and quality that will provide the design life as quoted in the Technical Schedule.

4.3.2 Control Voltage – DC Auxiliary Supply Voltage

The auxiliary supply voltage shall be 125V d.c. (nominal).

Auxiliary supply voltage requirements are specified in *EP 00 00 00 15 SP Common Requirements for Electrical Power Equipment*.

4.3.3 Circuit-breaker Type

The interrupting medium shall be either vacuum or SF6.

Each circuit-breaker shall consist of three separate "pole units" mounted on a single piece frame and shall be mechanically interconnected.

4.3.4 Vacuum Circuit-Breakers

Means shall be provided for testing the units for loss of vacuum without the necessity of removal of the units.

The contacts of the interrupter shall be held open by a positive fail-safe device independent of interrupter vacuum. The closing arrangement shall be designed so as to give a positive closing action whilst overcoming the contact hold open device.

4.3.5 SF6 Circuit-breakers

Each circuit-breaker shall consist of three separate "pole units" mounted on a single piece frame and shall be mechanically interconnected.

The design of the interrupting mechanism and contacts shall be such that the energy dissipated in the SF6 gas is low and does not cause appreciable degradation of gas.

Each pole shall be provided with a separate and independent set of main and arcing contacts to minimise degradation of main contacts during fault interruption. The arcing contacts shall be terminated by tungsten or similar tips and shall be of a high electrical endurance. The main contacts shall be capable of carrying the maximum short circuit current without damage. If butt type arcing contacts are provided, it shall be possible to check the wear of arcing contacts without the necessity to open pole units.

The internal surfaces of all porcelains shall not be glazed.

The circuit-breakers shall be guaranteed to have a leakage rate of less than 1% mass per year of the quantity of SF6 used for filling. Means shall be provided to check the internal pressure of the pole units.

The gas tightness shall be obtained by elimination of any part likely to wear or age.

A device for monitoring the SF6 pressure in each gas compartment while in service shall be provided. This device shall provide indication of the minimum permissible pressure level for safe operation and shall provide two alarm levels (voltage free contacts for each level):

- Level 1 alarm. This shall indicate a condition that the pressure of SF6 gas has dropped and the breaker needs attention. The circuit-breaker shall remain safe to operate.
- Level 2 alarm and operation inhibit. This shall indicate that the pressure of SF6 has dropped to a level where the breaker is not safe to operate. A set of contacts shall be arranged to prevent further operation of the circuit-breaker.

Certificates and details of tests for tightness carried out on pole units of breakers shall be maintained.

4.3.6 Circuit-breaker Operating Mechanisms

The circuit-breaker operating mechanism shall be an integral part of the circuit-breaker.

Any part of the mechanism that requires routine inspection and maintenance shall not be enclosed in any gas tight compartment.

The circuit-breakers shall be operated by stored energy motor spring charging mechanism. It shall be possible to perform all operations of the circuit-breaker manually or electrically.

All circuit-breakers in the closed position shall be able to have a TRIP-CLOSE-TRIP operation before the spring needs to be charged.

4.3.7 Circuit-breaker Operation and Control

The circuit-breaker closing mechanism shall be electrically operated, trip-free. The circuit-breaker mechanism shall provide lockout preventing closing, as defined in Clause 441-14-23 of AS 1852 (441) :1985.

The circuit-breaker shall close without delay when the close command signal is applied. While this command signal is applied, the circuit-breaker shall not make a second attempt to close if it fails to close on the first attempt.

The circuit-breaker shall open without delay when the open command signal is applied independently to any of the trip coils or to all trip coils simultaneously.

The circuit-breaker control shall be arranged to enable operation by local control or remotely via the SCADA system. The SCADA system will provide an OPEN or CLOSE command signal of 1.0A d.c. maximum, for a duration of 1.0 second.

A mechanical push-button or similar device for tripping the circuit-breaker shall be provided.

Necessary provisions shall be made to prevent the spring charge motor from continuous running in the event of failed spring charging.

Continuously rated control equipment to make the successful closing of the circuit-breaker independent of the length of time that the control switch is held in the CLOSE position and to ensure that only one closing attempt can be made if the control switch is held in the CLOSE position.

All operating coils of the control contactors associated with the solenoid-operated closing device shall be rated for continuous operation.

4.3.8 Mechanism Enclosure

The mechanism box shall be fabricated out of stainless steel of adequate strength/thickness. Other material shall be subject to RailCorp's approval.

The degree of protection for the operating mechanism box shall not be less than IP54. Provisions shall be made to padlock the mechanism box.

The mechanism box shall be provided with two earth studs on opposite sides for connection of 70 mm² earth wire.

4.3.9 Circuit-breaker Indication & Auxiliary Equipment

The following indication and auxiliary equipment shall be provided for the circuit-breaker in the mechanism box.

A control panel with:

- A local CLOSE and OPEN switch or push-buttons coloured red and green respectively.
- LOCAL – REMOTE changeover switch
- A mechanically operated indicator, indelibly marked, to show whether the circuit-breaker is open or closed. The word OPEN shall be visible only if the circuit-breaker is open and the word CLOSED shall be visible only if the circuit-breaker is closed. If colours are used in addition, then the colour green shall indicate the open condition and the colour red shall indicate the closed condition.
- If ACCB status indication lights are provided they shall be of the LED type.
- An indicator to show whether the stored energy device is charged or discharged.
- A non-resettable mechanical operation counter.
- A minimum of four normally open and four normally closed auxiliary switches rated at 10 A in a 125 V d.c. inductive circuit or a 240 V a.c. circuit.
- A set of terminals for the termination of auxiliary wiring. All auxiliary wiring such as for remote closing and tripping circuits, incoming DC control supplies and all spare auxiliary switches shall be connected to these terminals.
- Supervisory open and close interposing relays shall be provided.
- A 10A, 240V 1 phase, 50Hz general purpose outlet to Australian Standards shall be provided

All secondary fuse holders, including those used as links, shall be GEC "safeclip" type SC32/20 or similar as approved by RailCorp. Fuse holders containing a fuse link shall be coloured black and those containing a solid link shall be coloured white. Access to links and fuses shall be via the control/mechanism cubicle door. No panels should require removal for access.

All ancillary contactors and relays shall be of a type proven to be capable of handling the current and voltages involved in the normal operation of the switchgear. All operating coils, excepting the trip coils shall be continuously rated for the supply voltage used.

4.3.10 Control Wiring, Terminals etc

Refer to RailCorp standard EP 00 00 00 15 SP Common Requirements for Electric Power Equipment for details regarding general requirements of control wiring, terminals and related equipment.

4.3.11 Sound Levels and Interference Voltage (RIV)

The equipment may be installed in a residential area in close proximity to family residences. Noise and radio interference shall be kept to minimum levels. Guaranteed values of RIV shall be provided.

4.3.12 Terminal Palms

The material of the palm shall be aluminium alloy or tin plated copper to AS1734 or equivalent.

The busbar connections shall be free of sharp edges to reduce radio interference voltages/corona.

Termination palms shall suit the rating of the equipment in accordance with AS 62271.301 as appropriate to the current rating.

The exact terminal palm arrangement will be detailed at the time of tender.

4.3.13 Bushings

The Bushings shall be porcelain, silicon rubber or other proven synthetic material and shall be grey or light blue in colour. Internal surfaces of porcelain bushings shall not be glazed.

4.3.14 Current Transformers (CT)

Each circuit breaker will typically be required to be fitted with two sets of current transformers on both sides of the circuit breaker. Refer to Appendix A for details of CT specifications that are typical for the RailCorp network. The exact requirements will be specified at the time of order.

CTs shall safely withstand the mechanical and thermal stresses set up by a short circuit equal to the full short circuit rating of the circuit breaker.

They shall be provided with rating plates and terminal markings as specified in AS 60044.1. The rating plates shall be mounted in such a manner that they are visible, and the secondary terminals shall be readily accessible.

All CT secondary leads shall be terminated in individual test links at the marshalling strip within the mechanism/control box and are required to be clearly labelled. The star point of each set of CT's shall be earthed at one point. The CT test links are to be Weidmuller SAKC10. Refer to EP 19 00 00 02 SP for further requirements.

4.3.15 Colour of Equipment

The colour of any painted equipment shall be N42 unless otherwise agreed to by RailCorp.

5 Integrated System Support Requirements

5.1 Integrated Support Objectives

The circuit breaker manufacturer must establish and provide the information required to operate and maintain the equipment throughout its operational life, in a cost effective manner and to a level that is consistent with the planned operational performance and usage of the circuit breaker.

This includes:

- Specifying Maintenance Requirements.
- Spares Support.
- Operations and Maintenance Manuals.
- Training, and
- Support Equipment and Tooling.

5.2 Equipment Supplier Deliverable

The Integrated support requirements are a significant deliverable in the procurement of new circuit breakers.

Manuals, training, documentation and other support deliverable's shall be in accordance with *EP 00 00 0012 SP - Electrical Power Equipment - Integrated Support Requirements*.

6 Tests

Testing requirements are to be read in conjunction with the document *EP 00 00 00 15 SP, Common Requirements for Electric Power Equipment*.

6.1 Routine Tests

The following routine tests in accordance with *AS 62271.100 Clause 7* shall be conducted on all circuit-breakers and associated equipment.

- dielectric test on main circuit
- dielectric test on auxiliary and control circuits
- measurement of the resistance of the main circuit
- tightness test
- design and visual checks
- mechanical operating tests
- partial discharge measurement test

Results of routine tests shall be compared with those of type test results. Results of routine tests and acceptance will be subject to RailCorp approval.

6.2 Type Tests

The circuit-breakers shall be of type tested design. It is anticipated that the following type tests in accordance with AS 62271.100 Clause 6 have been successfully conducted.

Results of the type tests shall be submitted. Details of test certificates demonstrating compliance with the specifications including the date, results and name of the testing institution shall be provided.

Type test certificate for each of the specified type tests shall be accepted where it can be demonstrated that the circuit-breaker is of a similar design to the type tested circuit-breaker.

- dielectric tests
- radio interference voltage tests
- measurement of the resistance of the main circuit
- temperature-rise tests
- short-time withstand current and peak withstand current tests
- tightness tests
- EMC tests
- mechanical operation test at ambient temperature
- short-circuit current making and breaking tests
- capacitive current switching tests (as applicable)
- verification of the degree of protection
- low and high temperature tests
- humidity test
- static terminal load tests
- critical current tests
- electrical endurance tests

7 Data Set associated with the Equipment

The following data shall be supplied by the manufacturer and maintained for the circuit breakers. This data will remain the property of RailCorp.

7.1 Information

The information requirements set out in the following standards apply:

- *EP 00 00 00 12 SP* Electrical Power Equipment - Integrated Support Requirements
- *EP 00 00 00 15 SP* Common Requirements for Electric Power Equipment.
- *EP 03 02 00 01 SP* Controls & Protection for Rectification Equipment
- *EP 19 00 00 02 SP* Protection System Requirements for the High Voltage Network

7.2 Technical Schedule (Appendix B)

The information listed in the technical schedule of Appendix B, supplied by the manufacturer, shall be maintained for each circuit breaker.

7.3 Life Cycle Costing

All the data and assumptions pertaining to the determination of the whole-of-life cost calculations shall be recorded.

Appendix A Current Transformers

The current transformers listed below are typical transformers in use within the RailCorp system and should be used for the basis of tendering. The majority of circuit breakers will have two sets of current transformers on both sides of the circuit breaker.

The exact current transformer specification will be confirmed by RailCorp for each circuit breaker at the time of ordering.

Current transformers are required be manufactured in accordance with either *AS 1675* or *AS60044.1* depending on the specification provided by RailCorp.

Current Transformers (CT)		
<i>Current transformers on one side of ACCB</i>	OPTION 1	OPTION 2
CT core 1 Ratio CT performance, on lower tap Rated short circuit current for 3 sec Thermal limit current	300/200/5 A 10P100F20 25 kA 7.5A	1000/5 A 0.1PL160R0.5 25 kA 7.5A
CT core 2 Ratio CT performance, on lower tap Rated short circuit current for 3 sec Thermal limit current	400/300/5 A 2.5P300F20 25 kA 7.5A	Not required
<i>Current transformers on other side of ACCB</i>		
CT core 3 Ratio CT performance, on lower tap Rated short circuit current for 3 sec Thermal limit current	400/300/5 A 2.5P300F20 25 kA 7.5A	400/200/5 A 2.5P300F20 25 kA 7.5A
CT core 4 Ratio CT performance, on lower tap Rated short circuit current for 3 sec Thermal limit current	300/200/5 A 10P100F20 25 kA 7.5A	300/200/5 A 10P100F20 25 kA 7.5A

Appendix B Technical Schedule

33kV Outdoor Dead Tank Circuit-breakers

The manufacturer shall supply the following technical information. The information provided shall be guaranteed by the manufacturer and supported by type test certificates.

General details:

Name of the manufacturer
Country of manufacturer
Catalogue type/reference no.

Circuit-breaker ratings:

Type class
Rated voltage
Rated frequency
No. of phases
No. of poles
Rated normal current
Rated short circuit breaking current
Rated short circuit making current
Duration of short-circuit
Total break time
Rated short time withstand current
First-pole-to-clear factor
Rated operating sequence
Rated insulation level
Lightning impulse withstand voltage
Power frequency withstand voltage
Transient recovery voltage for terminal faults
Characteristics for short line faults
Rated opening time
Rated break-time
Rated closing time
Rated line-charging breaking current
Rated cable-charging breaking current
Rated single capacitor bank breaking current
Applicable standards

Circuit-breaker details:

- No. of breaks per pole
- Total length of break
- Type of main contact
- Type of arcing contact
- Type of arc control mechanism
- SF6 gas pressure (if applicable)
- SF6 gas applicable standards
- Mass of SF6 gas
- Guaranteed leakage per year
- Gas pressure switch provided
- Gas pressure switch setting
- Alarm
- Lockout
- Mass of complete circuit-breaker kg

Bushings:

- Material
- Type
- Make
- Country of origin
- Applicable standards
- Type tested Yes/No
- Provide list of type tests conducted with dates and names of test station
- External creepage distance
- Colour
- Maximum partial discharge level

Circuit-breaker tank:

- Material
- Thickness
- Gas pressure
- Welding technology
- Tightness test
- Bursting disc provided Yes/No

Operating mechanism:

- Type
- Make
- Country of origin
- Method of operation
- No. of trip coils
- No. of close coils
- Auxiliary supply voltage for close/trip coils
- Variation on auxiliary supply voltage
- Power consumed by close coil
- Power consumed by trip coil
- Spring charging motor rating
- Auxiliary supply voltage for spring charging motor
- Degree of protection (IP) Note: test certificate to be attached
- No. of free normally open auxiliary contacts available for RailCorp use
- No. of free normally closed auxiliary contacts available for RailCorp use
- Auxiliary contacts convertible Yes/No
- Space heater provided Yes/No
- Space heater rating/voltage
- Space heater thermostatically controlled Yes/No
- Weight of mechanism box

Control Wiring

- Wiring colours
 - o Active
 - o Neutral
 - o DC +ve
 - o DC -ve
- Size of wiring (CSA) used
- Does wiring conform to AS 3000 Yes/No

Steel structure

- Steel structure to support breaker included Yes/No
- Galvanised (hot-dip) Yes/No
- Weight of the structure kg

Environmental information:

- Maximum ambient temperature
- Maximum height above mean sea level
- Maximum wind pressure
- Seismic intensity
- Maximum noise level during breaker operation at 1 m distance dB
- Maximum radio interference voltage at 1 MHz μ V/kV
- Corona extinction voltage kV

Type test certificate:

Provide a list of type tests that have been conducted on the circuit-breakers. The following information should be provided:

- Name of test
- Test station where test was conducted
- Test date
- Test certificate number
- Detailed test report number

Routine test:

Provide a list of routine tests that will be conducted on each circuit-breaker before despatch.

Reliability data:

- Design life
- Failure modes (for early, normal life and wear out periods)
- Mean time between failures (MTBF)
- Mean time between repairs (MTBR)
- No. of units in Australia
- No. of units Worldwide

Recommended Spares

- Provide a detailed list of recommended spares:

Appendix C Request For Tender Checklist

Application

Request for Tender should be made in accordance with RFT Checklist in Specification *EP 00 00 00 15 SP, Common Requirements for Electric Power Equipment*.

Information To Be Supplied At Time Of Tender

When this document is used as the basis for procurement of 33kV outdoor dead tank circuit-breaker for a particular location, in addition to the general requirements in this standard the following information related to the particular site will need to be supplied:

- site location
- access road limits (weight, height and time limit)
- no. of circuit-breakers required
- delivery address
- Information To Be Sought From The Tenderer
- tenders to complete and submit Technical Schedule in Appendix B
- type test certificates/reports as specified
- tenders to complete and submit Integrated Support information as per RailCorp document *EP 00 00 00 12 SP Electrical Power Systems – Integrated Support Requirement*

Appendix D Requirements for Technical Aspects of Tender Evaluation

Evaluation of tenders

The Chief Engineer Electrical requires that persons evaluating the technical aspects of this tender have sufficient technical competence for the task.

Tender evaluation committees shall forward details of persons evaluating the technical aspects of the tender to the Chief Engineer Electrical for concurrence. This will normally be in the form of an email and is to include sufficient detail of the tender and the person to enable the Chief Engineer Electrical to satisfy himself of the merits of the evaluating person. A minimum of 4 weeks notice is required prior to the evaluation of the Tenders.

The Chief Engineer Electrical will advise only if the person is considered unsuitable for the technical evaluation.

Acceptance of product

A number of the specifications require acceptance of product at both the factory and at site. The purchaser is to advise the Chief Engineer Electrical the details of the person carrying out the acceptance testing for the concurrence of the Chief Engineer Electrical. A minimum of 4 weeks notice is required prior to the evaluation of the acceptance testing.

The Chief Engineer Electrical will advise only if the person is considered unsuitable for the acceptance testing.

The Chief Engineer Electrical reserves the right to nominate a representative to review and/or attend such acceptance.

Record Keeping

Where product is purchased against this specification, the Chief Engineer Electrical requires that relevant detail be provided so that it can be logged against this specification.

For RailCorp purchases, the tender evaluation committee shall advise the Chief Engineer Electrical the RailCorp registered file details containing the tender evaluation for future referencing. This is normally a TRIM reference.

Where this specification is utilised by parties external to RailCorp (Alliance parties, etc) then copies of all relevant technical information and evaluation shall be forwarded to the Chief Engineer Electrical for filing against the specification. In addition copies of selected commercial information pertaining to the ongoing support of the product as follows is also required.

- Warranty details
- Spare parts and associated availability
- Product support information.