Karara Mining Limited

卡拉拉矿业有限公司

Diesel Generator Sets Technical Agreement (833 KW& 4000L External Fuel Tank)

柴油发电机组技术协议（833KW 及 4000L 外置油箱）

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KARARA MINING LIMITED

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1 Introduction and Scope 简介和范围

This specification defines the minimum technical, safety, documentation, testing, and certification requirements for the procurement of low-voltage diesel generator sets rated at 833 kW, intended for continuous and reliable operation at the Karara Mining Site in Western Australia.

规范定义了采购额定功率为 833 kW 的低压柴油发电机组的最低技术、安全、文档、测试和认证要求，旨在在西澳大利亚卡拉拉矿区持续可靠地运行。

The purpose of this document is to:

- Ensure all generator sets procured via tender market meet Australian statutory and mining safety standards.
- Establish a single, binding technical reference used in the tendering process, evaluation, contract award, and acceptance testing.
- Define design life, performance standards, durability, safety features, and compliance expectations under harsh mine-site operating conditions.

本文件旨在：

- 确保所有通过招标市场采购的发电机组均符合澳大利亚法定和矿业安全标准。
- 建立用于招标流程、评估、合同授予和验收测试的单一且具有约束力的技术参考。
- 定义恶劣矿场运行条件下的设计寿命、性能标准、耐久性、安全特性和合规性预期。

All equipment and components must be:

- New, unused, and free of defects in material and workmanship.
- Designed for outdoor operation, with resistance to dust, UV, vibration, rain, and temperature extremes.
- Compliant with all relevant Australian and International Standards and designed for fit-for-purpose operation.

所有设备和组件必须：

- 全新、未使用，且无材料和工艺缺陷。
- 专为户外操作而设计，具有防尘、防紫外线、防震、防雨和耐极端温度的能力。
- 符合所有相关的澳大利亚和国际标准，并设计为适合用途的操作。

The scope of supply shall include a complete 833 kW diesel generator set, integrated within a containerised enclosure, and equipped with supporting control, cooling, and filtration systems. The supply shall also include:

- One (1) set of flexible earthing cable, suitably rated for the system, for connection to the site earthing grid at a maximum distance of 25 metres
- One (1) set of flexible power cable, appropriately sized for the generator set's output, for connection to the site load at a maximum distance of 25 metres
- One (1) set of galvanised cable ladder with cover, suitable for ground-level installation to support the supplied power and earthing cables

The supply shall include one (1) external double-walled diesel fuel storage tank with a minimum capacity of 4000 litres, complete with all necessary fuel lines, hoses, filters, valves, and certified leak-proof fittings. All required mechanical and electrical interconnections between the generator set and the fuel tank shall be included in the supply.

供货范围应包括一套完整的 833 kW 柴油发电机组，采用集装箱一体化安装形式，并配套控制、冷却和过滤系统。供货还应包括：

- 一（1）套柔性接地电缆，规格应符合系统要求，用于在 25 米以内连接至现场接地网
- 一（1）套柔性输出电缆，应根据发电机组输出容量选择合适规格，用于在 25 米以内连接至现场负载
- 一（1）套镀锌带盖电缆桥架，适用于地面敷设，承载所提供的输出电缆和接地电缆

此外，供货范围还应包括一（1）台外置双层柴油储油罐，最小容量为 4000 升，配备所有必要的输油管路、软管、过滤器、阀门及经认证的防泄漏连接件。发电机组与油罐之间所需的所有机械与电气连接部件亦应包含在供货范围内。

This technical agreement covers the system's minimum components, design minimum specification, standards, testing, certifications, and documentation requirements as specified in the following sections.

本技术协议涵盖系统的最小组成部分、设计最低规范、适用标准、测试、认证及文件要求，详见以下各章节。

The standards and regulations referenced in this technical specification are provided for indicative purposes only. It is the Supplier's sole responsibility to ensure that the supplied equipment set, including all associated drawings and documentation, fully complies with all applicable standards and regulations.

本技术规范中所引用的标准和法规仅供参考。供应商有责任确保其所提供的整套设备，包括相关图纸和文件，完全符合适用的标准及法规。

Any deviation from this specification shall be clearly identified in the Supplier's submission, accompanied by valid technical justifications to obtain written approval from the Company.

任何与本规范的偏差都必须在供应商提交的文件中明确标明，并附上有效的技术理由以获得公司的书面批准。

2 Declaration of Conformity 符合性声明

A qualified and insured organisation or company based in Australia (not necessarily a third party) shall be responsible for reviewing, assessing, and certifying the design, manufacture, and installation of the diesel generator sets, fuel tanks and any related accessories, as well as the relevant documents supplied. This organisation or company shall be nominated and mutually agreed upon by both the Company and the Supplier prior to the issuance of the contract.

一家在澳大利亚注册的具备资质并投保的机构或公司（不必为第三方）应负责对柴油发电机组、燃油箱及相关配件的设计、制造与安装、以及相关文件进行审核、评估和认证。该机构或公司应由双方（公司与供应商）在合同签署前共同指定并达成一致。

The final Declaration of Conformity, issued by this organisation or company for the supplied goods, shall serve as the primary certification confirming compliance with all applicable standards and regulations. The Company shall only accept the goods after this certification has been provided. Prior to the issuance of the final Declaration of Conformity, the Supplier shall, at their own cost, carry out all necessary modifications or rectifications to ensure full compliance with the system.

该机构或公司出具的最终符合性声明（Declaration of Conformity），应作为证明所供货物符合所有适用标准和法规的主要合规性文件。在收到该符合性声明之前，公司有权不予接收供货。在符合性声明出具前，供应商应自费对系统进行所有必要的修改或整改，以确保其完全符合要求。

3 Applicable Standards and Regulations 适用标准和法规

The complete generator sets, and external fuel tank shall comply with all applicable Australian Standards and Regulations. Where relevant Australian Standards are not available, equivalent IEC or ISO standards shall be

referenced. The equipment shall also meet all applicable Western Australian mining regulations to ensure it can be used on Western Australian mining sites without the need for further testing or certification.

整套发电机组及外置燃油箱须符合所有适用的澳大利亚标准。若无相关澳大利亚标准，可参照等效的 IEC 或 ISO 国际标准。设备还须满足所有适用的西澳矿业法规，以确保可直接在西澳矿区使用，无需额外的测试或认证。

3.1 Minimum Applicable Standards 最低适用标准

The following standards apply to this project and shall be adhered to as a minimum, but not limited to:

以下标准适用于本项目，并应至少遵守，但不限于：

Electrical Standards

电气标准

- AS/NZS 3000 - Wiring Rules 接线规则
- AS/NZS 3008.1 - Cable Selection 电缆选择
- AS/NZS 3010 - Electrical Installations - Generating Sets 电气安装 - 发电机组
- AS/IEC 60034 - Rotating Electrical Machines 旋转电机
- AS 60529 - IP Ratings (enclosure protection) IP 防护等级（外壳防护）
- AS/NZS 60947 - LV circuit breakers and switching devices 低压断路器和开关设备

Mechanical and Structural Standards

机械和结构标准

- AS 1692 - Steel Tanks 钢制储罐
- AS 1940 - Storage of Flammable Liquids 易燃液体储存
- AS 4024 - Machinery Safety Design 机械安全设计
- AS 4991 - Lifting Devices 起重设备
- ISO 8528 - Generator Set Testing 发电机组测试

Acoustic and Emission Standards

声学和排放标准

- AS 1055 - Environmental Noise 环境噪声
- US EPA Tier 2 or higher / EU Stage II minimum engine emission standard 美国 EPA Tier 2 或更高标准 / 欧盟 Stage II 最低发动机排放标准

Other Standards

其它标准

- AS/NZS 1841 - Portable Fire extinguisher 便携式灭火器
- AS 1319, ISO 7000, ISO 9244 - Labelling and Safety Symbols 标签和安全符号

4 Generator Set Requirements and Configuration 发电机系统要求和配置

Each diesel generator set shall be a complete, self-contained, weatherproof, and acoustically treated power package, suitable for long-term outdoor deployment in remote Western Australian mining conditions.

每台柴油发电机组应是一个完整的、独立的、防风雨的、经过隔音处理的动力装置，适合在西澳大利亚偏远的采矿条件下长期户外部署。

4.1 Minimum System Components 最小系统组件

This section states a summarised list of minimum system components that each unit shall include but is not limited to. The detailed design and technical requirements for components are stated in the following sections.

本节概述了每个单元应包含（但不限于）的最小系统组件列表。详细的设计和技术要求将在以下章节中说明。组件的设计与技术要求将在后续章节中详细说明。

Diesel Engine 柴油发动机

Alternator 励磁机

Skid Base Frame with Forklift Sleeves, Lifting, Tie-Down & Winching Points 滑轨底座框架配有叉车套筒、吊装、系紧点和绞盘点

Fire Extinguisher 灭火器

Guards for all rotating parts and hot surfaces 防护装置用于所有旋转部件和热表面

Acoustic Enclosure 隔音罩

Vertical Exhaust System with rain cap and spark arrestor 垂直排气系统配防雨帽和火花抑制器。

Fuel System 燃油系统

Cooling System 冷却系统

Starting System 启动系统

Battery Charger 电池充电器

Control System 控制系统

Cable Inlet with Gland Plate 配有压盖板的电缆入口

Emergency Stop Button 紧急停止按钮

Main Load Circuit Breaker 主负载断路器

4000L External Fuel Tank – Complete set with all required connections and accessories.

4000L 外置储油罐 – 配备所有必需的连接和配件的完整套件。

5 Environmental and Operational Design Conditions 环境和运行设计条件

5.1 Environmental Conditions 环境条件

The Generator Sets supplied under this Agreement shall be designed and manufactured to operate reliably and continuously under the following environmental conditions typical of remote Western Australian mining operations:

- Ambient Temperature: -15 to 50 degrees Celsius
- Relative humidity: Maximum 95%
- Altitude: less than 1000m
- Maximum Solar Radiation Intensity: 1.1kW/m^2
- Wind Loading: ultimate 3-second gust of approximately 180 km/h
- Pollution: Atmospheric dust with fine abrasive particles, slurry spillage and saline, high-pressure washdown water.
- Location: outdoors
- Ground: unsealed ground

根据本协议供应的发电机组应设计和制造为能够在西澳大利亚偏远地区采矿作业的典型环境条件下可靠、连续运行：

- 环境温度：-15 至 50 摄氏度
- 相对湿度：最高 95%
- 海拔：低于 1000 米
- 最大太阳辐射强度：1.1 kW/m^2
- 风荷载：极限 3 秒阵风风速约为 180 km/h

- 环境污染：大气粉尘中含有细微磨蚀颗粒，伴有泥浆溅落和高压冲洗水，以及盐雾环境
- 安装位置：户外
- 地面条件：未铺设地面

5.2 Design Life & Durability 设计寿命和耐久性

The generator shall conform to below design life and durability requirements.

发电机应符合以下设计寿命和耐久性要求。

Minimum Design Life: 10 years of continuous or standby operation

Construction Quality: Highest-grade materials and assembly suited for rugged site conditions

Corrosion Protection:

- Powder-coated or stainless-steel enclosures
- Rust-proof base frame, painted or galvanised

Ingress Protection (IP):

The generator set shall comply with AS/IEC 60529 in relation to ingress protection requirements. Each component shall meet or exceed the minimum IP ratings specified in this document. The complete generator set shall be suitable for outdoor installation in high-dust and wet environments, providing effective protection against wind-driven rain, airborne dust, and routine washdown exposure.

- IP23 minimum for alternator enclosure
- IP54 minimum for generator enclosure and control panel.
- IP42 minimum for AC Main Switchgear Compartment

最低设计寿命：10 年连续或待机运行

结构质量：采用最高级材料和组装，适用于恶劣的现场条件

防腐蚀：

- 粉末涂层或不锈钢外壳
- 防锈底座，喷漆或镀锌

防护等级 (IP)：

发电机组应符合 AS/IEC 60529 标准关于防护等级的要求。各组件的防护等级应满足或高于本文件中规定的最低标准。整机应适用于高粉尘、潮湿环境下的户外安装，并能有效防止风雨、粉尘及日常冲洗造成的内部侵入。

- 发电机励磁机外壳的防护等级不得低于 IP23 防护等级
- 柴油发电机整体外壳，包括控制面板的防护等级不得低于 IP54 防护等级
- 交流主开关设备舱的防护等级不得低于 IP42 防护等级

5.3 Structural Strength 结构强度

All Generator Sets shall be structurally capable of:

- Withstanding the forces associated with transportation, including loading and unloading via tilt-tray truck or crane.
- Supporting their full operational weight without deformation or failure.
- Lifting via integrated certified lifting points in accordance with relevant Australian Standards, without risk to personnel or damage to the equipment.
- Withstanding shock, vibration, and minor impact loads encountered in transit and during repositioning on-site.
- Withstanding specified winding load onsite

所有发电机组的结构应具备以下能力：

- 承受运输过程中产生的力，包括使用翻斗车或吊车装卸。
- 支撑其全部运行重量，不变形或损坏。
- 通过符合相关澳洲标准的集成认证吊点进行吊装，不会对人员造成危险或损坏设备。
- 承受运输过程中和现场重新定位过程中遇到的冲击、振动和轻微冲击载荷。
- 能够承受现场风荷载条件

6 Electrical and Control System Design 电气及控制系统设计

6.1 General Electrical Requirements 一般电气要求

The Generator Sets shall be designed for integration with a Low Voltage (LV) three-phase, 415V, 50Hz, MEN earthed power system, compliant with relevant Australian electrical installation standards.

发电机组应设计为与低压 (LV) 三相、415V、50Hz、MEN 接地电力系统集成，符合相关澳洲电气安装标准。

The electrical system shall be capable of continuous and reliable operation within the following tolerances:

- Power: 1000kVA
- Power Factor: >80%
- Real Power: >833kW
- Voltage variation: ±5% of nominal voltage
- Frequency variation: ±2% of nominal frequency
- Transient voltage variation: ±10%
- Transient voltage recovery time: 3 seconds
- Transient frequency variation: ±10%
- Transient frequency recovery time: 5 seconds
- Total Harmonic Distortion (THD): ≤5%

电气系统应能够在以下公差范围内持续可靠运行：

- 视在功率：1000kVA
- 功率因数：>80%
- 有功功率：>833kW
- 电压变化：标称电压的±5%
- 频率变化：标称频率的±2%
- 瞬态电压变化：±10%
- 瞬态电压恢复时间：3 秒
- 瞬态频率变化：±10%
- 瞬态频率恢复时间：5 秒
- 总谐波失真（THD)：≤5%

6.2 Alternator 励磁机

The alternator shall be a brushless synchronous type, directly coupled to the engine, and supplied by an internationally recognised manufacturer (e.g. Stamford or equivalent). It shall be rated for continuous operation at 833 kW, 415 V, 50 Hz, 3-phase, 4-wire. The alternator shall be suitable for use in specified environments and fully compatible with the genset controller and protection systems.

The alternator shall comply with the following:

- Fully conformant with relevant Australian Standards
- Protection rating: Minimum of IP23
- Insulation class: Class H insulation with Class F temperature rise
- Voltage regulation: Controlled by a compatible AVR, maintaining voltage within ±5%

- Waveform quality: Total Harmonic Distortion (THD) ≤5% under full linear load

励磁机应为无刷同步类型，与发动机直接联接，并由国际认可的制造商提供（例如 Stamford 或同等品牌）。额定功率为 833 kW，输出电压为 415 V，频率 50 Hz，三相四线制。励磁机应适用于明确指定的环境，并与机组控制系统及保护系统完全兼容。

励磁机应符合以下要求：

- 设计与性能标准：完全符合相关澳洲标准
- 防护等级：符合 AS/IEC 60529 的最低 IP23 要求
- 绝缘等级：采用 H 级绝缘系统，温升限于 F 级
- 电压调节：匹配的自动电压调节器（AVR），稳态电压波动范围不超过 ±5%
- 波形质量：在满载线性负载下，总谐波失真（THD）不大于 5%

6.3 Control and Automation 控制与自动化

Each Generator Set shall be provided with a generator controller from a globally recognised manufacturer (e.g. ComAp), and shall support the following functions as a minimum:

- Manual and automatic start/stop operation
- Voltage, frequency, and current monitoring and protection trip
- Engine fault alarms and protection trip logs
- Under/over-speed protection
- Remote start/stop signals capability (hard-wired)
- Integration of 4G network module for condition monitoring and remote control.
- Integration capability with SCADA/PLC systems through Modbus and Ethernet.

The control system shall be supplied with software, programming cables, and a permanent license to allow full access to control logic modification, parameter tuning, and fault diagnostics.

每台发电机组应配备由全球认可的制造商（例如 ComAp）提供的发电机控制器，并至少具备以下功能：

- 手动和自动启动/停止操作
- 电压、频率和电流监控及保护跳闸
- 发动机故障报警和保护跳闸日志
- 低速/超速保护

- 远程启停信号功能（硬接线）
- 集成 4G 网络模块，用于状态监控和远程控制。
- 可通过 Modbus 及 Ethernet 与 SCADA/PLC 系统集成。

控制系统应配备软件、编程电缆和永久许可证，以允许完全访问控制逻辑修改、参数调整和故障诊断。

6.4 Power Distribution and Protection 配电与保护

Each Generator Set shall be equipped with the following protective and switching devices:

每台发电机组应配备以下保护和开关装置：

Main Load Circuit Breaker 主负载断路器

The generator set shall be equipped with a main load circuit breaker, appropriately rated to match the generator's nominal three-phase output. The circuit breaker shall be:

- A 3-pole moulded case circuit breaker (MCCB) supplied by an internationally recognised manufacturer.
- Fitted with a lockable OFF position for mechanical isolation and safe lockout/tagout procedures
- Thermal and magnetic trip parameters shall be adjustable, allowing coordination with downstream protection settings
- Equipped with an earth leakage protection module (RCD accessory) for personnel and equipment safety
- Compliant with AS/NZS 60947 series, including:
    - AS/NZS 60947.2 - Circuit breakers
    - AS/NZS 60947.4.1 - Contactors and motor starters (if integrated)
    - AS/NZS 61009 - Residual current protection (for RCD functionality)
- Certified with any other applicable certifications

发电机组应配置一个与发电机额定三相输出相匹配的主负载断路器。该断路器应具备以下特性：

- 三极塑壳断路器（MCCB），国际认可的制造商品牌。
- 具备可上锁的断开（OFF）位置，以便实施机械隔离和上锁挂牌（LOTO）安全操作
- 断路器应具有热脱扣和磁脱扣参数可调功能，以便与下游保护设备协调整定
- 配备漏电保护模块（RCD 配件），以增强人员与设备的运行安全
- 整体设计应符合 AS/NZS 60947 系列标准，包括但不限于：

  - AS/NZS 60947.2：断路器规范
  - AS/NZS 60947.4.1：接触器和电动机起动器
  - AS/NZS 61009：剩余电流保护装置规范
- 符合其它适用认证要求

Battery Isolator Switch 电池隔离开关

Battery Isolator Switch double pole, lockable, with clear ON/OFF position labelling

电池隔离开关应为双极，可上锁，带有清晰的 ON/OFF（开/关）位置标签

Isolation Lockout Tabs 隔离上锁挂扣

Isolation Lockout Tabs should be equipped on all output switches and terminal enclosures.

所有输出开关和端子外壳上应装有隔离上锁挂扣

6.5 Earthing and Bonding 接地和连接

All metal enclosures, frames, and hinged panels shall be effectively bonded in accordance with AS/NZS 3000, including the use of:

- Flexible earth straps on all doors
- Bonding star washers on fixed panels
- Protective earthing for any mounted electrical devices

An accessible earth stud shall be installed on the skid frame for site bonding.

所有金属外壳、框架和铰链面板均应按照 AS/NZS 3000 标准进行有效接地，包括使用：

- 所有门上均应安装柔性接地带
- 固定面板上应安装星形垫圈
- 所有已安装电气设备的保护接地

应在滑轨框架上安装可触及的接地螺柱，以便进行现场接地

6.6 Starting System 启动系统

Each Generator Set shall be fitted with a 12V or 24V DC electric starter, complete with:

- Lead-acid or AGM batteries, maintenance-free
- Securely mounted battery holder with restraint mechanism
- Lockable double-pole battery isolator switch

- Battery terminal protection covers
- Battery charger (240VAC input) with dry contacts for charger fault alarm to control panel

每台发电机组应配备 12V 或 24V 直流电启动器，并配备：

- 免维护铅酸电池或 AGM 电池
- 带约束装置的牢固安装电池座
- 可锁双极电池隔离开关
- 电池端子保护盖
- 电池充电器（240VAC 输入），带干触点，用于向控制面板发送充电器故障警报

6.7 Emergency Protection 紧急防护

A clearly marked, externally mounted Emergency Stop (E-Stop) device shall be installed in accordance with AS 4024.1604 and ISO 13850. The device shall be manually latched, fail-safe, non-resettable except by manual intervention, and operable at ground level.

An externally mounted Emergency Stop (E-Stop) button shall:

- Be red with a yellow background
- Be non-resettable except by deliberate manual action
- Operate on extra low voltage and be fail-safe
- Be clearly labelled “Emergency Stop”

应根据 AS 4024.1604 和 ISO 13850 标准安装一个带有清晰标记的外部紧急停止 (E-Stop) 装置。该装置应手动锁定、具有故障安全功能、除非手动干预否则不可复位，并且可在地面操作。

外部安装的紧急停止 (E-Stop) 按钮应：

- 红色，背景为黄色
- 除非手动操作否则不可复位
- 采用超低电压操作并具有故障安全设计
- 清晰标明“Emergency Stop”

6.8 Engine protection system 发动机保护系统

The engine protection system shall include all necessary protections to ensure the safe and reliable operation of the diesel generator set. As a minimum, the system shall incorporate the following protections, but shall not be limited to:

- Electrically operated emergency stop

- Low engine oil pressure alarm and trip
- Coolant high temp alarm and trip
- Coolant level low alarm and trip
- Fuel level alarm and trip
- Water in fuel alarm

Engine tripping shall be via a normally energized solenoid to cut off the fuel supply via the electronic signal acting on the governor. Trip setting shall be adjustable independently from the alarm settings. Engine trips shall also trip the generator circuit breaker. Each engine trip shall have an alarm/indication light at the control panel to indicate the fault that initiated the trip.

发动机保护系统应包括所有必要的保护功能，以确保柴油发电机组的安全可靠运行。至少应包含但不限于以下保护项目：

- 电动紧急停机装置
- 低机油压力报警及跳闸
- 冷却液高温报警及跳闸
- 冷却液位低报警及跳闸
- 燃油液位过低报警及跳闸
- 燃油中含水报警

发动机跳闸装置应通过常通电磁阀切断燃油供应，并通过电子信号作用于调速器。跳闸设定值应独立于报警设定值进行调整。发动机跳闸装置还应跳闸发电机断路器。每次发动机跳闸装置时，控制面板上都应有一个报警/指示灯，指示引发跳闸的故障。

6.9 Cable 电缆

All electrical cables used in the generator set shall be compliant with AS/NZS standards AS/NZS 5000.1, AS/NZS 1125, and AS/NZS 3008.1, and other applicable standards and certification requirements.

All power and control cables used in the generator set system shall be selected and installed to withstand the environmental and operational conditions specified. All control and signal cables must be clearly marked and terminated with heat-shrink labels or permanent tags.

The external earthing cable supplied shall be:

- Suitably rated for the system
- Suitable for a maximum of 25 meters of connection
- XLPE insulated
- Flexible

- Green/Yellow Color
- Minimum of 25 meters

The external power cable supplied shall be:

- Suitably sized for the generator’s output
- Suitable for a maximum of 25 meters of connection
- 3-phase single-core cables and one neutral cable (N)
- XLPE insulated
- Steel Wire Armored
- Flexible
- One end lugged, and one end open.

The colour coding shall be as follows:

- Three Phase:
    - Phase L1: Red
    - Phase L2: White
    - Phase L3: Blue
    - Neutral: Black
    - Earth (PE): Green/Yellow
- Control Wiring:
    - 24V DC control – Orange
- Bonding Earth
    - Green/Yellow

所有用于发电机组的电缆必须符合相关 AS/NZS 5000.1、AS/NZA 1125、AS/NZS 3008.1、澳新标准，及其它适用标准及认证要求。

所有动力电缆及控制电缆必须根据本技术协议中规定的环境与运行条件进行选型与安装。所有控制与信号电缆必须清晰标识，并使用热缩标签或永久性标牌进行端接标识。

外部接地电缆应具备以下条件：

- 额定参数适用于系统要求
- 适用于最大 25 米连接距离
- 采用交联聚乙烯（XLPE）绝缘
- 具备柔性结构

- 电缆颜色为绿/黄双色

外部输出电缆应具备以下条件：

- 截面尺寸应满足发电机组输出能力
- 适用于最大 25 米连接距离
- 三相单芯电缆和一根中性线电缆（N 线）
- 采用交联聚乙烯（XLPE）绝缘
- 具备钢丝铠装（SWA）结构

电缆颜色编码应符合以下要求：

- 三相系统：
  - 相线 L1：红色
  - 相线 L2：白色
  - 相线 L3：蓝色
  - 中性线（N）：黑色
  - 接地（PE）：绿/黄双色
- 控制电缆：
  - 24V DC 控制回路：橙色
- 等电位接地线（Bonding Earth）：绿/黄双色

6.10 Busbar 母线

The generator shall include a main power output busbar system rated for not less than 125% of the generator's nominal current output, constructed from tinned copper, fully shrouded, and installed with touch-safe covers. The busbar assembly shall comply with AS/NZS 61439. Phase identification and protective earth bar shall be clearly marked and installed as per AS/NZS 3000.

The busbar for each phase shall be designed with:

- Four (4) termination points, allowing the connection of up to four cable lugs, accessible from both the front and rear sides
- Adequate hole spacing and bar width to accommodate large cable lugs, including sizes up to 600 mm², without interference or overlap

发电机应配备一套主输出母线系统，其额定电流不得低于发电机额定输出电流的 125%。母线应采用镀锡铜材质制造，具备完整防护罩，并配备防触电的安全盖。母线

组件须符合 AS/NZS 61439 标准的设计与制造要求。相线标识及保护接地铜排应根据 AS/NZS 3000 标准清晰标明并正确安装。

每一相的母线应具备以下特性：

- 配置四（4）个电缆连接端口，支持从母线前后两侧连接最多四个电缆接线端子
- 具有足够的孔距与母排宽度，可无干涉地安装最大至 600 mm² 的大尺寸电缆端子

7 Mechanical Design, Fuel, Cooling, and Safety System 机械设计、燃料、冷却和安全系统

The Generator Sets shall be constructed to facilitate reliable operation, ease of maintenance, and compliance with relevant safety standards under continuous duty in remote mining conditions.

发电机组的结构应确保在偏远采矿条件下连续运行，可靠运行、易于维护，并符合相关安全标准。

7.1 Diesel Engine 发动机

The diesel engine supplied with the generator set shall comply with a minimum of US EPA Tier 2 or EU Stage II emission standards applicable to non-road diesel engines, as defined in:

- US EPA Code of Federal Regulations Title 40 Part 89/1039 (Tier 2)
- EU Directive 97/68/EC and amendments (Stage II)

Alternatively, engines from other international brands may be accepted if they have test reports issued by an ISO 9001-certified organisation, demonstrate equivalent or superior performance, and have a service centre located in Perth.

The Supplier shall provide a valid Emission Compliance Certificate or EU Declaration of Conformity, issued by the engine manufacturer or an internationally accredited certification body. The certificate must reference the engine model and serial number and must be included in the technical submission.

发电机组所配备的柴油发动机应至少符合 美国 EPA Tier 2 或 欧盟 Stage II 非道路移动机械排放标准。或者可接受由具备 ISO 9001 认证的机构出具测试报告、性能等同或优于上述标准等级，并在珀斯设有维修服务点的其他国际品牌发动机。

供货商应提供由发动机原厂或国际认可的认证机构出具的有效《排放合格证》或《合格声明》，并随技术资料一并提交，文件中应明确列出发动机型号及序列号。

7.2 Frame 机架

The generator set shall be installed inside a reinforced ISO container and mounted on a heavy-duty skid base frame, designed to support the complete genset assembly under static and dynamic loads during transportation, lifting, and installation. The skid base shall be constructed from high-strength structural steel, with full perimeter base support.

The container shall be structurally reinforced to withstand site wind loading conditions in accordance with AS 1170.2, with a minimum design wind speed of 50 m/s (180 km/h) ultimate 3-second gust.

The supplier shall provide a Load Test Report or Finite Element Analysis (FEA) and corresponding compliance certification for the container and skid base frame as part of the generator technical data package.

The frame shall incorporate clearly marked and reinforced lifting lugs and tie-down points, suitable for multi-point lifting via crane and secured land transport. These features shall be designed and certified in accordance with AS 4991 (Lifting Devices) and AS 4024 (Safety of Machinery – Design Principles).

Lifting lugs installed shall:

- Avoid sharp edges or pinch points
- Be located to avoid rotation or tipping
- Include visible Safe Working Load (SWL) markings
- Be compatible with standard lifting equipment (hooks, shackles)

All lifting and tie-down points shall:

- Be rated with visible permanent markings indicating Safe Working Load (SWL) and lifting method
- Be designed with adequate structural margin (typically ⩾1.5x SWL) based on worst-case lifting angle and load case
- Undergo design verification by finite element analysis (FEA) or equivalent mechanical stress analysis
- Be load tested and certified by a qualified third-party body or the original equipment manufacturer (OEM) operating under a certified ISO

9001 quality system under AS 4991 (Lifting Devices) and AS 4024 (Safety of Machinery – Design Principles).

The generator outer frame shall have the provision of cable entry with a pre-mounted gland plate, the location shall be easy to access and close to the main circuit breaker.

发电机组应安装在加固型 ISO 集装箱内，并固定在重型滑轨底座框架上。该底座应能够在运输、吊装和安装过程中承受整套发电机组的静态和动态载荷，确保结构稳定与安全。底座框架应由高强度结构钢制造，具备全周边支撑结构。

集装箱结构应经过加固，能够承受现场风荷载条件，设计极限 3 秒阵风风速不低于 50m/s（180km/h）。供应商须提供具备资质工程师出具的结构验证与合规性证明文件

供应商应在发电机技术资料包中提供集装箱及滑轨底座框架的载荷测试报告或有限元分析（FEA）报告，以及相应的合规性认证文件。

底座应配备清晰标识并加固的吊装耳及捆绑点，可满足多点吊装与陆路运输加固要求。以上结构件的设计与认证须符合 AS 4991《起重装置》及 AS 4024《机械安全设计原则》的相关标准。

吊装耳的设计须满足以下要求：

- 避免尖锐边缘或夹伤风险
- 安装位置应防止吊装时旋转或倾覆
- 明确标识安全工作载荷（SWL）
- 适配常用吊装设备（如吊钩、卸扣）使用

所有吊装点及捆绑点均应：

- 带有永久性清晰标识，注明安全工作载荷 SWL 及吊装方式
- 在最不利吊装角度和载荷工况下，具备不少于 1.5 倍 SWL 的结构安全裕度
- 经过 FEA 或同等机械应力验证方法进行设计验证
- 由具备资质的第三方机构或通过 ISO 9001 质量体系认证的原设备制造商（OEM）按 AS 4991 和 AS 4024 标准执行负载测试并出具认证报告。

发电机外部机架应有预装压盖板的电缆入口，位置应易于接近且靠近主断路器。

7.3 Fuel System 燃油系统

Each Generator Set shall be fitted with an integrated bunded fuel tank, capable of providing no less than twenty-four (24) hours of operation at 100% rated load. The tank shall include:

- High and low level float switches and alarm relays
- Level indicators
- Self-contained bund capable of retaining at least one hundred and ten percent (110%) of the total fuel and coolant volume
- Lockable filler cap or enclosure;
- Non-spill filler design, including for moving at an angle of up to 15°
- Isolation valves, high-level shut-off, and tank drainage via a lockable valve labelled "Bund Drain – Keep Closed and Locked When Not in Use"

All fuel system components shall comply with AS 1940 and AS 1692 and other applicable standards and regulations. Fuel lines must be protected from vibration, wear, and high temperatures.

Installation, use, refuelling provisions, bunding (if applicable), shall comply with AS 1940, including any requirements for spill containment, fire safety, signage, and operator access.

每台发电机组均应配备集成式围堰式燃油箱，该燃油箱能够在 100%额定负载下运行至少 24 小时。燃油箱应包含：

- 高低液位浮动开关及报警继电器
- 液位指示
- 独立式围堰，可容纳至少 110%的燃油和冷却液总量
- 可锁式加油口盖或封盖；
- 加注口应采用防溢设计，包括在设备倾斜至 15° 以内时仍能防止燃油溢出。
- 隔离阀、高液位截止阀以及通过标有"Bund Drain – Keep Closed and Locked When Not in Use"的可锁阀门进行油箱排水。

所有燃油系统组件均应符合 AS 1940 和 AS 1692 标准，及其它适用标准和法规。燃油管路必须受到保护，免受振动、磨损和高温的影响。

储罐的安装、使用、加油设施、以及防泄漏措施（如设有围堰）等，必须符合 AS 1940 的相关规定，包括对泄漏控制、消防安全、警示标识及操作人员可达性等方面的要求。

7.4 Cooling System 冷却系统

The cooling system shall include an oversized radiator and pusher fan configuration designed to maintain operational temperature under a 50° C ambient condition. A fouling margin of 10% and a safety factor of 10% must be incorporated into the heat exchanger and radiator design.

Fans shall be:

- make from reinforced, heat-resistant material
- rated for engine-duty usage
- with a minimum IP2X protection rating

Coolant systems shall include a bypass line, thermostat valve, and accessible drain points to facilitate maintenance and internal flushing.

冷却系统应包含一个超大尺寸散热器和推进式风扇配置，旨在在 50° C 的环境条件下保持工作温度。热交换器和散热器的设计必须考虑 10% 的污垢裕度和 10% 的安全系数。

风扇应符合以下要求：

- 采用加固型耐热材料制成
- 具备适用于发动机工况的使用等级
- 具有不低于 IP2X 的防护等级

冷却液系统应包含旁通管路、恒温阀和易于维护的排水点，以便于维护和内部冲洗。

7.5 Lubrication and Filtration 润滑和过滤

The lubrication system shall include:

- Engine-driven oil pump
- Oil cooler
- Pressure relief valve
- High-temperature and low-pressure shutdown protection
- Replaceable oil filters

润滑系统应包括：

- 发动机驱动的油泵
- 油冷却器
- 压力释放阀
- 高温低压停机保护装置
- 可更换的机油滤清器

Air filtration shall include:

- Dual-stage heavy-duty air filter with replaceable elements
- External self-cleaning pre-cleaner

空气过滤系统应包括：

- 带可更换滤芯的双级重型空气滤清器

- 外部自清洁预滤器

Fuel filtration shall include:

- Water separator with drain
- Dual-stage fuel filter system

燃油过滤系统应包括：

- 带排水装置的油水分离器
- 双级燃油过滤系统

7.6 Guard 防护罩

All rotating parts, including belts, pulleys, and fans, shall be fully enclosed by mechanical guards in accordance with AS 4024, ISO 3457, and other applicable standards. The guards shall be removable only with tools. Where guarding is not practicable, equivalent engineering controls shall be applied to ensure no access is possible to rotating parts while in operation.

Exhaust components and other hot surfaces during normal operation shall be shielded with thermal guards to prevent accidental contact and meet personnel safety requirements.

All mechanical guard surfaces shall be affixed with permanent warning signage in accordance with AS 4024.1901 (Safety of Machinery – Principles for the Design and Selection of Warning Signs).

所有旋转部件，包括皮带、滑轮和风扇，均应按照 AS 4024、ISO 3457、及其他适用标准，采用机械防护装置完全封闭。防护装置仅可用工具打开。如果无法设置防护装置，则应采取等效的工程控制措施，保证无法在设备运行中接触旋转部件。

正常运行期间，排气部件和其他热表面应采用隔热装置进行防护，以防止意外接触，并满足人员安全要求。

所有机械防护罩表面均应按照 AS 4024.1901《机械安全 警告标识和安全标志的使用规范》的要求，设置永久性警告标识。

7.7 Exhaust system and Spark Arrestor 排气系统和火花抑制器

The generator set shall be equipped with a vertical exhaust discharge system, incorporating a rain cap to prevent ingress of water during standby conditions. A certified spark arrestor shall be installed in the exhaust

line, compliant with the requirements of AS 2660-2001 and other applicable standards and regulations.

发电机组应配备垂直排气系统，并安装防雨帽以防止待机期间雨水进入排气口。排气系统中必须安装符合 AS 2660-2001（火花抑制器构造与性能要求）标准及其它适用标准和法规的火花抑制器。

7.8 Fire Safety 消防安全

The Generator Set shall be supplied with two (2) portable fire extinguisher, and the 4000L external fuel tank shall be equipped with one (1) portable fire extinguisher. The fire extinguisher shall be mounted externally on a steel bracket with a dual-locking mechanism, compliant with AS/NZS 1841 and other applicable standards and regulations. Fire extinguishers must be vertically mounted and tested within the last 3 months.

发电机组应配备两（2）具便携式灭火器，外置 4000L 储油罐应配备一（1）具便携式灭火器。灭火器应安装在带有双锁定机制的钢支架外部，符合 AS/NZS 1841 标准及其它适用标准和法规。灭火器必须垂直安装，并在过去 3 个月内进行测试。

8 Labeling 标签

All equipment delivered under this Agreement shall be permanently and clearly labelled in the English language, using engraved stainless-steel tags or UV-stable decals.

Labels shall be:

- Complying with AS 1319 and ISO 7000 and other applicable standards and regulations
- Legible from a minimum distance of 1 metre
- Resistant to UV exposure, abrasion, solvents, and high-pressure water cleaning
- Affixed using rivets, bolts, or industrial-grade adhesive

根据本协议交付的所有设备均应使用刻字不锈钢标签或抗紫外线贴纸，以英文进行永久清晰的标识。

标签应：

- 符合 AS 1319 澳洲标准、ISO 7000 国际标准及其它适用标准和法规
- 至少在 1 米距离内清晰可见
- 耐紫外线照射、磨损、耐溶剂和高压水清洗
- 使用铆钉、螺栓或工业级粘合剂固定

Labels shall include but not be limited to:

- Electrical hazard warnings and voltage indications (marked with "Danger, Live Voltage, Authorized Personnel Only" and "No Smoking, No Open Flames".)
- Fuel type and safety precautions
- Component identification (circuit breakers, switches, sockets, filters, etc.)
- Engine model and serial number
- Generator alternator specifications
- Emergency procedures (e.g. CPR and Fire Extinguisher signage)
- All cables should be marked at both ends and at all points where they penetrate bulkheads or enter or leave conduits.
- High visibility reflective strips on the outer case in all directions

标签应包括但不限于：

- 电气危险警告和电压指示（标有"Danger, Live Voltage, Authorized Personnel Only" and "No Smoking, No Open Flames"等）。
- 燃料类型和安全预防措施
- 部件标识（断路器、开关、过滤器等）
- 发动机型号和序列号
- 发电机规格
- 应急程序（例如心肺复苏和灭火器标识）
- 所有电缆的两端以及穿过舱壁或进入或离开导管的所有位置都应标记。
- 外壳上应有全方位高可见度反光条

Weight markings (“WET WEIGHT: XXXX KG”) must be prominently displayed on both sides of the enclosure using stencils or decals, compliant with Australian transport standards. Markings must account for:

- Full fuel tank
- Engine and coolant fluids
- Any attached standard accessories and modifications
- Factory-mounted fire extinguishers or ballast weights

重量标记（“湿重：XXXX 公斤”）必须使用符合澳大利亚运输标准的模板或贴纸，在车厢两侧醒目位置显示。标记必须包含以下信息：

- 满油箱
- 发动机油和冷却液
- 所有附带的标准配件和改装件
- 原厂安装的灭火器或压载物

All lifting and tie-down shall be visibly labeled with their rated load capacity and function (e.g. “LIFT ONLY”, “TIE-DOWN”). Obsolete or non-use points shall be marked “NOT A LIFTING POINT.”

所有起重、系紧和绞盘点均应清晰地标明其额定负载能力和功能（例如“LIFT ONLY”，“TIE-DOWN”）。废弃或未使用的点应标记为“非起重点”。

9 External Fuel Tank 外置储油罐

Supplier shall provide a fully compliant, self-contained external diesel fuel storage tank with a nominal capacity of 4000 litres, complete with all required connections, pipes, fittings, containment, protection, and monitoring systems, both internal and connected to the generator.

The external tank shall be suitable for outdoor mining environments and compatible with the generator fuel system through approved transfer methods.

供应商应提供一个完全符合要求的、独立式的外部柴油储油罐，标称容量为 4000 升，配备所有必要的连接件、管道、配件、围护结构、防护装置及监控系统，涵盖油罐本体内部以及与发电机之间的所有连接部分外部

储罐应适用于室外采矿环境，并通过经批准的转运方式与发电机燃料系统兼容。

9.1 Fuel Tank Design 油箱设计

The external fuel tank and its components shall comply with the latest editions of all applicable Australian Standards and Regulations. The following applicable standards shall be complied with as a minimum, but not limited to:

- AS 1940 – The Storage and Handling of Flammable and Combustible Liquids
- AS 1692 – Steel Tanks for Flammable and Combustible Liquids
- EPA and Dangerous Goods Safety requirements of Western Australia

外部燃油箱及其组件应符合以下适用标准的最新版本：

- AS 1940 – 易燃和可燃液体的储存和处理
- AS 1692 – 易燃和可燃液体钢制储罐
- 西澳大利亚州环境保护署和危险货物安全要求

9.2 Fuel Tank Minimum Technical Requirements 油箱最低技术要求

The external fuel tank shall include, at minimum:

- Bunded construction, integral or self-contained, capable of retaining 110% of the maximum tank volume
- Low- and high-level alarms, compatible with the generator control system via dry contacts
- Mechanical fuel level gauge with visible indication from exterior
- Ventilation system to prevent overpressure or vacuum under all fill and draw conditions. The ventilation outlet should be at least 2.5 meters above the ground.
- Lockable filler cap and fuel draw-off fittings
- Fuel transfer solenoid valve and non-return valve
- Mechanicals overfill protection device (float valve or shutoff)
- Earthing and bonding points in accordance with AS/NZS 3000
- Forklift sleeves and crane lifting lugs, structurally rated and labelled
- Drain valve for bunded area, with padlock-able cover and label: “Bund Drain – Keep Closed When Not in Use”

外部油箱至少应包含以下配置：

- 整体式或自带式围堰结构，可容纳最大油箱容积的 110%
- 低油位和高油位报警装置，可通过干触点与发电机控制系统兼容
- 机械式油位计，外部可视指示
- 通风系统，防止所有加油和抽油情况下出现过压或真空。通风口应距地面至少 2.5 米。
- 可锁式加油口盖和燃油抽油接头
- 燃油输送电磁阀和止回阀
- 机械式溢流保护装置（浮阀或截止阀）
- 符合 AS/NZS 3000 标准的接地和连接点
- 叉车套管和起重机吊耳，结构额定值和标签符合 AS 4991 标准
- 围堰区域排水阀，配有可挂锁的盖子和标签：“Bund Drain – Keep Closed When Not in Use”

9.3 Fuel Tank Identification and Labelling 油箱标识和标签

The tank shall be permanently labelled with:

- Nominal and total capacity
- Diesel fuel identification with Class C1 flammable liquid markings
- “NO SMOKING,” “DANGER - FLAMMABLE LIQUIDS,” “CONFINED SPACE - ENTRY BY PERMIT ONLY,” and “BUND DRAIN” safety signs
- Fill and suction point labels
- High visibility weight and lifting point markings
- Asset ID plate
- High visibility reflective strips on the outer case in all directions

油箱应永久贴有以下标签：

- 标称容量和总容量
- 柴油燃料标识，标有 C1 级易燃液体标志
- “NO SMOKING,” “DANGER - FLAMMABLE LIQUIDS,” “CONFINED SPACE - ENTRY BY PERMIT ONLY,” 及 “BUND DRAIN” 安全标志
- 加注点和吸油点标签
- 高可见度重量和起吊点标记
- 资产识别牌
- 外壳上全方位高可见度反光条

All signage and labelling shall comply with AS 1319 and ISO 7000 and be legible in harsh environmental conditions.

所有标牌和标签均应符合 AS 1319 和 ISO 7000 标准，并在恶劣的环境条件下清晰可辨。

10 Warranty and Support 质保与支持

10.1 Performance Acceptance Testing 性能验收测试

Within sixty days of Good Acceptance, the Company shall conduct a Performance Acceptance Test to confirm full compliance with contractual specifications.

在接收货物后六十天内，公司应进行性能验收测试，以确认完全符合合同规范。

If the Company is unable to conduct the test within the specified period due to internal reasons, successful commissioning shall be deemed to satisfy acceptance.

如果公司因内部原因无法在规定期限内进行测试，则调试成功应视为验收合格。

In the event of failure in performance test, the Supplier shall make all necessary corrections at their cost and repeat the test until compliance is achieved.

如测试不合格，供应商应自费进行所有必要的纠正，并重新进行测试，直至符合要求。

10.2 Warranty 质保

The diesel generators shall be covered by a minimum warranty period of twenty-two (22) months commencing from the date of the site acceptance. The actual warranty terms and period shall be as specified in the Contract.

柴油发电机的保修期最少为自现场验收之日起二十二（22）个月。实际质保期限及相关条款以合同中约定的条款和条件为准。

During the warranty period, the Supplier shall:

在质保期内，供应商须满足以下服务要求：

- Respond within twelve hours of any service request
  在收到服务请求后 24 小时内响应
- Provide remote technical support as required
  提供必要的远程技术支持
- Replace or repair defective parts with original parts
  使用原厂配件进行故障更换或维修

The Supplier shall nominate a Western Australia-based service provider to perform all servicing and repairs for the supplied product within the warranty period.

供应商应指定一家持牌且位于西澳大利亚的服务机构，在保修期内负责对所提供的产品进行所有的维护和维修工作。

If a part fails due to manufacturing or material defects, the Supplier shall replace it free of charge.

如因制造缺陷或材料问题导致部件故障，供应商应免费更换。

Following the warranty period, the Supplier shall offer continued technical and spare parts support.

质保期结束后，供应商仍须持续提供技术与备件上的支持。

10.3 Commissioning and Training 调试与培训

The Supplier shall provide technical assistance for installation, commissioning, and verification testing. The Supplier shall conduct at least two (2) full day of operation and maintenance training for the Company's personnel. Training shall include:

公司有权要求供应商提供安装调试技术支持与性能验证测试协助。并须为公司人员提供不少于两（2）天的操作与维护培训，内容包括：

- Theoretical instruction 理论教学
- Hands-on operation 实操演练
- Fault diagnostics and maintenance procedures 故障诊断与维护流程

11 Supplier Document Submission Requirement 供应商文件提交要求

11.1 Technical Qualification Submission 技术资质文件递交

To ensure that all bidders possess the necessary technical capability, quality assurance systems, and regulatory compliance required for the manufacture, supply, and servicing of the proposed product for use on Western Australian mine sites, each bidder shall submit a package of Qualification Review Materials. The following sections set out the preferred documents and information to be provided.

为确保投标公司具备为西澳矿区制造、供应及服务拟供产品所需的技术能力、质量保证体系及法规合规能力，每一投标公司应提交一份资质审查文件包。以下各节列出了建议的文件和信息清单。

All materials shall be submitted in English, and all certificates shall be original documents or notarised copies.

所有资料应以英文提交，所有证书应为原件或经公证的复印件。

11.1.1 Compliance Qualification 合规资质

1. Nominated Australian Compliance Entity
   指定的澳大利亚合规实体
   - Details of the appointed Australian company (may be internal or external to the bidder) responsible for issuing the Declaration of Conformity to all applicable Australian Standards, WA Mines Safety and Inspection Regulations, and other statutory requirements.
     提供负责出具符合所有适用澳大利亚标准、西澳矿业安全及监察条例及其他法规要求的符合性声明的澳大利亚公司的详细信息（该实体可以是投标公司自身或外部合作方）。

- Confirmation of the involvement by the nominated entity (If external to the bidder)
  如为投标公司外部实体，需提供该指定实体参与本项目的确认文件。

2. List of Compliance
   合规性清单
   A list of the standards, regulations, and codes to which the proposed product complies.
   提供一份清单，列明拟供产品所符合的所有标准、法规及规范。
3. ISO Certification
   ISO 认证
   Valid ISO 9001 Quality Management System or equivalent certificate, issued by a recognised accreditation body.
   提供有效的 ISO 9001 质量管理体系或同等体系认证证书，该证书须由认可的认证机构颁发。

11.1.2 Technical Capability and Product Documentation 技术能力及产品文件

1. Product and Service Conformance Statement
   产品与服务符合性声明
   Confirmation that the proposed product meets each technical requirement, performance specification, and any service and support outlined in this document, and state any variations.
   确认拟投标的产品满足本文件中列明的各项技术要求、性能指标及服务与支持要，并指明任何偏差变动。
2. Technical Specification Package
   技术规格文件包
   - Complete technical datasheet of the proposed product, covering all mechanical, electrical, noise level and safety aspects.
     提供拟供产品的完整技术数据表，涵盖所有机械、电气、噪声水平及安全相关参数
   - External Fuel tank specification and accessories
     外置储油罐规格及配件
3. Draft Bill of Material (BOM)
   物料清单（BOM）初稿
   - A list of proposed product major components bill of materials with make, model, quantity (engine, generator, main breaker, sockets, controller, major relays, fuel tank, exhaust, etc.)

提供拟投产品的主要组件物料清单，应包括：品牌、型号及数量（发动机、发电机、主断路器、控制器、主要继电器、燃油箱、排气系统等）。

4. Product IOM Manual (Installation, Operation & Maintenance)
产品说明书手册（安装、运行与维护手册）
   - IOM manual for the proposed product.
     提供拟供产品的说明书手册
   - Engine and alternator manuals
     发动机及励磁机的说明书手册
   - Controller manual
     控制器说明书手册

4. Full Product Visual Display
产品全方位展示资料
Photographs or drawings showing all sides of the product:
提供展示产品各个方向的照片或图纸：
   - External and Internal View
     外部及内部展示
   - Control panel and electrical design
     控制面板及电气设计

11.1.3 Quality and Service Capability 质量及服务能力

- Summary of the Supplier's Quality Assurance and Quality Control Procedure relevant to design, manufacture, inspection and testing of proposed product, and factory acceptance test template.
  提供与拟供产品设计、制造、检验及测试相关的供应商质量保证与质量控制程序概要及出厂测试模板
- Details of the appointed service, repair, and warranty support agent and the lead time to provide any of these services.
  指定服务、维修及质保支持代理的详细信息及上述各项服务的响应/到场前置时间。
- Outline of typical spare parts availability, lead time to Western Australia, and support arrangements.
  提供典型备品备件供应能力说明，包括运至西澳的交货周期及服务保障方案

11.1.4 Supporting Information 支持信息

- Any additional product design information and qualification information the Supplier is willing to disclose
  任何供应商愿意披露的、与产品设计及质量保证相关的补充资料

11.2 Design Submission and Approval 设计递交和批准

The Supplier shall submit a full design package for approval by the Company after signing the contact. The package shall include, but not be limited to:

- Equipment complete datasheet
- Final Bill of Materials (BOM) of all major components
- General arrangement drawings and dimensions
- Electrical schematics and wiring diagrams
- Draft Declaration of Conformity issued by the Nominated Australian Compliance Entity

供应商应在合同签署后提交完整的设计方案供公司审批。该方案应包括但不限于：

- 设备完整的数据表
- 最终主要组件材料清单（BOM）
- 总体布置图及尺寸
- 电气原理及接线图
- 由指定的澳大利亚合规实体给出的符合性声明初稿

No manufacturing shall commence prior to the Company's written approval of the design documentation. The Supplier shall revise and resubmit any non-compliant design at its own cost until full compliance is achieved.

未经公司书面批准设计文件，不得开始任何生产。供应商应自行承担费用，修改并重新提交任何不合规的设计，直至完全合规。

Failure to obtain design approval prior to fabrication shall constitute a breach of contract and may result in termination without compensation.

制造前未能获得设计批准将构成违约，并可能导致终止合同且不予赔偿。

11.3 Document Submission Before Delivery 交付前文件递交

The Supplier shall provide a complete documentation package for review and approval prior to delivery. This package shall demonstrate full compliance with all specified technical, functional, and regulatory requirements applicable to the proposed product and its components. The documentation shall include:

供应商应在交付前提供一套完整的文件资料供采购方审核与批准。该资料应充分证明拟供产品及其各组成部分满足所有规定的技术、功能及法规要求。文件资料至少应包括：

- Final Declaration of Conformity – issued and signed by the nominated Australian entity
  由指定澳大利亚合规实体签发的最终版符合性声明
- FAT Inspection and Test Report
  出厂检查和测试报告
- As-built General arrangement and electrical schematic drawings
  与实物一致的总体布置图和电气原理图
- Product IOM Manual (Installation, Operation & Maintenance)
  产品说明书手册（安装、运行与维护手册）
- Final warranty certification and contact for service
  最终版保修单及服务点联络信息
- Site Acceptance Checklist
  现场验收检查清单
- Daily Pre-start Checklist
  日常启动前检查清单

The Supplier shall remain responsible for promptly submitting any missing or supplementary documents necessary for acceptance, installation, repair, commissioning, or maintenance, even if such documents are not expressly listed in the original specification.

供应商应承担持续资料提交义务：即便某类文档未在本协议中明确列出，若其对设备验收、安装、调试、运行或维修维护构成必要支持，供应商亦应在合理时间内主动提供，且不得额外收费。

Review & Approval

审批

REQUESTED BY 申请人	Name 姓名	Signature 签名	Date 日期
Engineer 工程师	Tianpei Zhao		1/12/2025
Superintendent HST 安全主管			
Requesting Party Manager 需求方经理			
Equipment Department Manager 设备部门经理			
Deputy Manager 分管副总经理			