MIAC

Proposal Document for HVAC Equipment Design, Installation and Maintenance Services for Offshore Oil & Gas Facilities

Prepared By:

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1.0
Introduction

1.0 Introduction

MIAC Services Co., Ltd is a specialist company operating in the field of HVAC Design, Construction, Installation and Maintenance supporting Marine and Offshore Oil & Gas Industries.

This proposal has been prepared as a pre-qualification document for the Supply Installation, Commissioning and Aftermarket Services of Heating, Ventilating, Air Conditioning and Refrigeration Equipment & Systems for Marine & Offshore platforms specific to the Offshore Oil & Gas industries.

MIAC Services has an established Contracts Department performing both new build and equipment replacement projects. Our team of professionals consisting of both Expatriate and Thai National Engineers manage Marine and Offshore Oil & Gas projects from design through to final commissioning and hand over.

MIAC Services has dedicated teams of highly experienced Service Technicians who respond to emergency call outs overhaul & repairs to HVAC and Refrigeration systems in Onshore Industrial, Marine and Offshore Oil & Gas facilities.

Maintenance contracts covering all HVAC and Refrigeration equipment are provided by MIAC Services ranging from routine Planned Preventative Maintenance to Fully Comprehensive parts and labor packages.

Spares Unlimited is MIAC Services Spare Parts Department which provides HVAC and Refrigeration Spare Parts for Marine and Offshore Oil & Gas equipment. A long established relationship with wide variety of manufacturers enables MIAC Services to offer a wide range of products of new and direct replacement parts competitively.

2.0
Company Structure

2.0 Company Structure

MIAC Services (Singapore) Pte. Ltd. is located in Gul Circle and from here performs HVAC System Design and Project Management for Asia Region while MIAC Thailand's Manufacturing Facility in Chonburi Thailand designs and manufactures project specific HVAC equipment for the Offshore Oil & Gas Industry.

Operations and Factory

Located in Chonburi Province Thailand our Operations Facility and Factory houses the Product Engineering Group, Engineering Support Services, Drawing Office, Offshore Services and local Administration.

3.0
Company Profile

3.0 Company Profile

MIAC Services recognized the need for a quality specialist Heating, Ventilating, Air Conditioning and Refrigeration (HVAC&R) company to serve the needs of the industries very demanding clients operating in SE Asia, Indochina and Burma particularly in the Offshore Oil & Gas, Marine Industries.

MIAC Services in Thailand and Singapore has established a team of specialists to provide solutions to HVAC & Refrigeration issues in the Offshore Oil & Gas, Marine and Offshore Industries. Since 2002, MIAC has been carefully selecting its team of both Thai National and Expatriate personnel who are qualified and experienced in our industry and are able to work with and provide solutions for major international companies.

MIAC Services operates within an organic, fluid structure designed to provide a timely response to meet the needs of its customers. Project teams are formed to provide Project Management, Engineering Design, Manufacture, Installation, Commissioning and Maintenance Services.

4.0
Design and Contracting

4.0 Design & Contracting Capabilities

MIAC Engineering designs, supplies, installs and commissions complete HVAC & Refrigeration systems to the Marine and Offshore Oil and Gas Industry.

Equipment and systems are designed and manufactured to meet the specific requirements of the customer.

Alternatively where specifications allow, HVAC&R systems can be designed and installed using equipment supplied by other major manufacturers.

Typical examples of Offshore and Marine HVAC & Refrigeration packages are as follows:

- Hazardous area Air-Conditioning & Refrigeration Systems
- Unclassified Area Air-Conditioning & Refrigeration Systems
- Ventilation, Exhaust & Room Pressurisation Systems
- Chillers & Chilled Waters Systems for Corrosive Atmospheres
- Air & Water Cooled Condensers and Heat Exchangers for Corrosive Atmospheres
- PLC Control Systems for interfacing HVAC with Facility Control Systems
- Air Conditioning & Refrigeration Compressors
- Provisions Stores

5.0
Services & Maintenance Capabilities

5.0 Services & Maintenance Capabilities

Effective HVAC & Refrigeration equipment repair & maintenance provides a level of assurance in plant and equipment integrity. MIAC Services provides a comprehensive system upgrade, repair & maintenance service covering the complete range of HVAC & Refrigeration products.

This service includes the review of existing maintenance routines and performance standards for industrial, and process cooling equipment. For Offshore, Fixed Platforms, Mobile Drilling Rigs & FPSO's.

MIAC Engineering has an Offshore Crew to enable HVAC repairs and maintenance to be performed with confidence.

More specialist equipment can be maintained though MIAC Campaign Maintenance Strategy.

- Heat Exchanger Re-tubing
- Eddy Current Tube Analysis
- Compressor Overhauls
- Motor Repairs & Rewinds
- Fan Balancing
- Electrical Repairs
- Pump Repairs
- Refrigerant Reclaim

6.0
Products

6.0 Products

MIAC has developed a range of HVAC products specifically for the Marine and Offshore Oil and Gas Industry; this is the **MIAC Mariner** product range covering Packaged and Split equipment up to a capacity of 350kW.

HVAC Equipment

MIAC has a significant range of standard HVAC Products specifically designed to meet the requirements of the Marine & Offshore Oil & Gas Industry.

Most HVAC equipment used in Marine and Offshore applications is derived from existing Industrial Products and modified to meet project specifications. The MIAC MARINER HVAC products have been designed specifically to meet the stringent requirements for Marine and Offshore applications.

To develop Mariner Equipment, it was necessary go back to the basics to design from “the bottom up” and establish an engineered design which ensures long equipment life cycle and reliability .

The key to our product design is flexibility:

- Flexibility in Design
- Flexibility in Capacity
- Flexibility in Dimensions
- Flexibility in Materials
- Flexibility in Area Classification

MIAC manufactures HVAC equipment for the Marine & Offshore Oil, Gas and Energy Industry.

- Air Handling Units
- Air Cooled Condensing Units
- Packaged Skid

- Air Cooled Chillers
- Water Chillers
- HVAC Control Package

Utilizing our standard construction method each unit is specifically designed to comply with project requirements.

A complete range of specialist materials are used to comply with the stringent requirements of our industry and to ensure the required design life.

Mariner Air Handling Units

Constructed from Stainless Steel and double skin as standard with mineral wool insulation, fully welded penta-post construction for rigidity and long life, the double skin construction also helps prevent noise break out. MIAC Mariner design incorporates features to prevent thermal bridging and prevents condensation forming on the outer surface.

All internal components are removable via the service access doors or removable casing panels.

Fans

A complete selection of fans is available to meet specifications generally pressed steel forward curve or welded steel backward inclined and manufactured mild steel or stainless steel. Non- sparking components such as brass inlet cones and drive guards are used to comply with hazardous area requirements. Fan systems are engineered to maintain room or building pressurization without the need for additional pressurization systems.

Motors

Drive motors are generally Totally Enclosed Fan Cooled and available with Voltage and Frequencies to meet client requirements. Where required we use motor manufactures to comply with client preferred vendors. All Safe Area motors are also provided complying with Zone 1 or Zone 2 Area Certification.

Cooling Coils

Cooling coils for both Chilled Water and Direct Expansion coils are manufactured from various materials to comply with client requirements including Copper fins with epoxy coating and Electro Tinned Copper fins. The Coil frame is Stainless Steel. The copper tubes are fitted with the copper fins and then the tubes are expanded to ensure reliable thermal transfer through the fins under all working conditions.

Heating Coils

Heating Coils are available for hot water or steam in the same materials as cooling coils, while electric heating coils with stainless steel elements are available with Zone 1 or Zone 2 Area Certification.

Filtration

High efficiency bag and panel filters are provided and installed in a stainless steel frame with rotating securing devices to allow easy replacement with minimum effort. Other special filters such as HEPA and coalescing are available as specifications require.

Dampers

A wide range of dampers are available to meet specific requirements, these include Fire, Volume Control, Mixing, Shut Off and Back Draft. Damper control is achieved by manual locking quadrants, electric or pneumatic actuators with hazardous area classification equipment. The dampers are manufactured from stainless steel with high quality maintenance free bearings on moving parts.

Controls and Instrumentation

Pressure indicators, sensors and switches are provided for data transmission on filter condition, fan performance, damper positions and other critical components. These are factory installed and wired to a control junction box for simple on-site connections. The instruments and junction boxes comply with the area electrical classification.

Wiring and Cables

All electric motors, space heaters and other power-driven devices are factory wired to a junction box installed outside the casing for ease of site connection. Cables are halogen-free with glands and junction boxes complying with area classification.

Configuration

Air handling units can be configured as a Single Skid unit, Duty Standby configuration Double

Stacked or Side By Side. Condensing Units can also be fitted to the same skid making a self contained Packaged HVAC Skid whereby these can then be factory tested and commissioned cutting down the work scope in the shipyard or offshore.

In addition Air Handling Units can be built in sections for assembly in a final location where access space is restricted.

Casings

MIAC Marina AHU & Condensing Units have a standard design and construction method, as with all MIAC Marina HVAC products, flexibility is the main consideration.

Condensers

Accessibility for maintenance and condenser airflow direction are two of the important factors always considered. Compressors are positioned inside the condensing unit envelope with maintenance access through a door or removable panel allows monitoring of oil sight glasses and removal of compressor components for servicing. Other items in the refrigerant circuit are positioned so that routine maintenance can be carried out easily. Condenser air flow direction is also flexible with top, side or end discharge depending on location of surrounding equipment.

Compressors

Compressors are selected for flexibility using either Semi Hermetic Reciprocating or Screw type. They are also available with open drive motors. The compressors and electrical components are also available to comply with hazardous area classifications. Compressors are mounted on isolators to prevent vibration being transmitted to buildings or other structures. Compressor safety controls are selected to meet hazardous area classification where required.

Condenser Fans

Condenser Fans are directly mounted to the motors to reduce vibration and maintenance requirements. Various fan materials are available including UV resistant poly carbon and marine grade aluminium. Anti-spark tracks are also available for positioning inside housings.

Condenser Coils

Condensing coils are manufactured from various materials to comply with client requirements including Copper fins with epoxy coating and Electro-tinned copper fins.

The MIAC product range includes

- Air Cooled Condensing Units (5 to 375 kW)
- Air Cooled Water Chillers (20 to 375 kW)
- Air Handling Units
- System Control & Communication Packages
- Refrigeration Skid Packages
- Refrigerant Leak Monitoring Systems
- Duct Heater Units
- Stainless Steel Ductwork

Spares Unlimited is the Supplies Division of MIAC-ARV Engineering Co., Ltd. which provides Air-Conditioning and Refrigeration Spare Parts to Hazardous Area, Offshore Platforms & FSPO's and Marine Industries.

MIAC-ARV Engineering has a long established relationship with a variety of manufactures enabling us to offer a wide range of new and direct replacement equipment competitively.

The range of items includes:

- Air Handling Units, Fan Coil Units and Components
- Air Conditioning Units, Spare Parts, Controls
- Air Filters, Belts, Fans & Motors, Industrial & Hazardous Area Rated
- Air Filtration Units and Spare Parts

- Compressor & Spares, Bitzer, Carrier, Trane, York, J&E Hall, Copeland Maneurop etc.
- Ductwork & Components inc VCD's Fire Dampers, Heater batteries Silencers & Grills
- Evaporators & Condensers both Air & Sea Water Cooled
- Galley / Kitchen Refrigeration & Spares
- Pumps, Seals, Bearings & Pulleys
- Refrigerant Gasses including drop in replacements for CFC/HCFC's
- Refrigerant Oils for all types of applications
- Refrigeration parts, expansion valves, pressure & temperature controls
- Specialist Electrical Equipment & Control Systems
- Water Chillers for Air-Conditioning & Industrial Applications

Specifications include:

- Hazardous Area Semi Hermetic Compressors including crank case heaters
- Hazardous Area Electric Motors
- Hazardous Area Unit Controls and Sensors
- Anti Spark Fans
- Corrosion resistant materials and SS316L Options
- Marine Grade Water to Water Heat Exchangers
- Copper fin Evaporator and Condenser Coils with Electro Tinned and other Special Coatings.

7.0
Marine & Offshore Track Record

Marine & Offshore Track Record

Year 2002

ChevronTexaco

Benchamas Expansion Project

New HVAC equipment had been installed on BLQ and BPP platforms by another company but was not commissioned.

Working under a sub-contract to Premier Environmental, MIAC Engineering was employed to take over and successfully complete the HVAC project.

Scope of work

BLQ

Commission 55kW capacity HVAC system serving the Instrument & Electrical Workshop, Mechanical Workshop and Maintenance Stores.

Commission two (one run, one standby) 35 kW capacity HVAC systems servicing the Central Control Room.

BPP

Commission two (one run one standby) 55 kW capacity HVAC systems serving the Motor Control Center and Laboratory.

Year 2003

ChevronTexaco

Benchamas HVAC Modifications & Upgrades

As a result of earlier HVAC commissioning, subsequent reports and recommendations, modifications and upgrades were necessary in order that the systems would perform correctly and reliably.

Working under a sub-contract to Premier Environmental, MIAC Engineering was employed to perform system modifications and upgrades.

Scope of Work

BLQ

Equipment

55kW capacity HVAC system serving the Instrument & Electrical Workshop, Mechanical Workshop and Maintenance Stores.

Repair refrigerant leaks and modify system to prevent further leaks.

Modified electrical control systems in order to maintain correct operating temperatures in individual air conditioned spaces.

Two (one run one standby) 35 kW capacity HVAC systems servicing the Central Control Room.

Installed Current Inverter Drives to the supply air fan motors in order to reduce excessive static pressure and noise in control room.

Modified control system in order to control room humidity.

Modified control system to provide automatic change-over function should operating system go into fault status.

Installed a stand alone packaged unit to cool UPS and Communication Equipment room.

BPP

Equipment

Two (one run one standby) 55 kW capacity HVAC systems serving the Motor Control Center and Laboratory.

Installed Current Inverter Drives to the supply air fan motors in order to control excessive static pressure fume cupboard extract in Laboratory.

Installed air lock door system on entrance to Laboratory.

Modified control system to provide automatic change over function should operating system go into fault status.

Year 2003 / 2004

ChevronTexaco

MFP Stage 2

Eight well head platforms which included control room HVAC systems were to be constructed by Thai Nippon Steel at their Samut Prakarn yard. Early in the project ChevronTexaco identified a deficiency with their Singapore based HVAC system vendor.

MIAC Engineering was employed to carry out a survey of the first platform prior to its sail away to the Tantawan field. The survey and subsequent report to ChevronTexaco identified a number of deficiencies in the design, selection and construction of the MFP 2 HVAC systems.

As a result of a meeting between Singapore contractor, ChevronTexaco and MIAC Engineering, a contract was placed for QA/QC to be undertaken by MIAC Engineering.

Scope of Work

Work with HVAC vendor at their Singapore factory to modify HVAC system design, and construction method.

Visit manufacture of Fire and Barometric dampers in Malaysia to discuss and overcome various manufacturing issues.

Visit Singapore vendor and perform Factory Acceptance Testing of prior to shipping of each HVAC system.

Supervise commissioning and functionality of HVAC for each platform prior to sail away.

Supervise offshore modifications carried out by Singapore Vender to HVAC systems.

2004/2005

CUEL

PLOCPP2 Oil & Gas Processing and Utility Platform Fabricated in Leam Chabang, Chonburi

Scope of Work

Fabrication and installation of air distribution system including fire dampers, volume control dampers, stainless steel external ductwork and galvanized internal ductwork.

Due to complexity of Control Room part of the fabrication was carried out in Leam Chabang yard then completion of ductwork carried out offshore.

Install interconnecting refrigeration pipework comprising of four circuits between compressor bank, air cooled condenser and two air handling units. Pressure testing, dehydration & evacuation, charging with refrigerant and refrigeration system commissioning.

2004/2005

ChevronTexaco

BLQ Galley Freezer

Called to platform to provide specialist assistance, after surveying the system most of the equipment was beyond its useful life, temporary repairs were made to keep the system operational, this was followed with a proposal to replace the equipment.

The proposal was subsequently accepted, equipment including condensing units, indoor blowers, pipework and cabling was replaced. As part of this exercise both cold rooms were upgraded to achieve temperature of – 20degC.

2006

Global Santafe

Compact Driller

Survey to Compact Driller HVAC systems covering short term, medium term and long term issues.

Complete engineering report covering HVAC systems with supporting engineering and HSE documentation.

Replacement and upgrade of HVAC systems in accommodation section, replaced condensing units and replaced refrigerant to non CFC

2006

Specialist Services (Dubai)

Chevron Additional Living Quarters (Benchamas ALQ)

Complete HVAC for living quarters module for 44 personnel.

Turnkey package including Detailed Design, Manufacturing, Installation and Commissioning.

Design and production of software for Alan Bradley HVAC PLC

Hazardous area Class 1 Division 2 rated equipment with complete Alan Bradley PCL driven control system interfacing platform master control.

Fabrication and installation of air distribution system including fire dampers, volume control dampers, stainless steel external ductwork and galvanized internal ductwork.

Install interconnecting refrigeration pipework comprising of four circuits between compressor bank, air cooled condenser and two air handling units. Pressure testing, dehydration & evacuation, charging with refrigerant and refrigeration system commissioning.

Manufacture of Duty and Standby Custom Built Air Handling Units and Condensing Units.

2007

CUEL Thailand

CTOC

Carigali Hess Compressor Module Equipment Shelter (CKR3)

Complete HVAC system for Equipment Shelter . Turnkey package including Detailed Design, Manufacturing, Installation and Commissioning.

Hazardous area Class 1 Division 2 rated equipment with complete Alan Bradley PCL driven control system interfacing platform master control.

Fabrication and installation of air distribution system including fire dampers, volume control dampers, stainless steel external ductwork and galvanized internal ductwork.

Fabrication taking place in Leam Chabang Thailand

Install interconnecting refrigeration pipework comprising of four circuits between compressor bank, air cooled condenser and two air handling units. Pressure testing, dehydration & evacuation, charging with refrigerant and refrigeration system commissioning.

Fabrication of Duty and Standby Air Handling Units and Condensing Units in SS 316L

2007

Direct Engineering Services Marine & Offshore

KUPE Well Head Platform

Manufacture and supply Stainless Steel 316L ductwork and associated equipment for ventilation and pressurization system. Design and manufacture Duct Heaters.

2007

Direct Engineering Services Marine & Offshore

Puteri Project Carigalli Malaysia

Design and manufacture air conditioning split systems to marine & offshore specifications and associated control panels with Siemens PLC. Commissioned equipment in Malaysian shipyard before load out.

2007

Direct Engineering Services Marine & Offshore

B 295 Keppel Fels manufacture HVAC Control Panels

2007

Global SantaFe Vietnam

Upgrade and change out of HVAC accommodation, switch & control room and provisions store equipment on Galveston Key jack up driller changed out all other HVAC refrigerants to HFC.

2007

Direct Engineering Services Marine & Offshore

AFAM / Okoloma Shell Nigeria Manufacture HVAC Control Panels

2007

Direct Engineering Services Marine & Offshore

B 273 / 4 / 5 / 6 Keppel Fels manufacture HVAC Control Panels

2008

FPSO Vincent

Mearsk, Keppel Yard Singapore

Commissioning complete HVAC system in Accommodation Section and M85 Generator Control Room. Responsible for pre-commissioning electrical services, start up and commissioning of chilled water system, pumps, chillers and air handling units. Commissioning and testing of fire dampers and air balance.

2008

Global SantaFa

Compact Driller, Gulf of Thailand

Complete replacement provisions stores refrigeration equipment.

Manufacture and install new condensing units and electrical control system, install new evaporator units and interconnecting pipework and cabling.

2008

Nexus FPSO

Samsung Heavy Industries, Direct Engineering Services.

Design and manufacture complete provisions store refrigeration system. Including water cooled refrigeration condensing unit skid, electrical control system and evaporator units.

2009

D30 MOPU

Integrated Technologies Sdn. Bhd
Global Processing Systems

Design, supply, install and commission HVAC System for CCR Module. Work performed in MMHE Ship Yard in Johor Malaysia

2009

Dana MOPU

Integrated Technologies Sdn. Bhd
Global Processing Systems

Design, manufacture, supply and install a forced ventilation system for all below deck areas and HVAC system for UPS and Switch Gear rooms. Installation performed in MMHE Ship Yard in Johor, Malaysia

2009

Chim Sao Vietnam

TX Engineering
PTSC
Premier Oil

Design, Manufacture, Supply and Commission HVAC system for Chim Sao platform. Engineering and manufacture carried out at MIAC-ARV workshop in Thailand, equipment delivered to Vung Tao Vietnam for installation and commissioning.

2010

Platong Offshore Facility

Asian Offshore Services
Chevron Thailand Exploration and Production

Design, Manufacture, Install and Commission complete HVAC system for existing and extension to Switch and Control Room on Platong CPP located in Gulf Of Thailand

2010

Benchamas Offshore Facility

Airco
Chevron Thailand Exploration and Production

Design, Manufacture, Install and Commission complete HVAC system for existing Motor Control Center on Benchamas Facility located in Gulf Of Thailand

8.0
Marine and Offshore Personnel

9.0 Marine & Offshore Personnel

MIAC Services employs both Local and Expatriate personnel to perform its marine and offshore operations.

Employee recruitment carried out at senior management level, applicants are from a variety of sources, previous working relationships, newspaper advertising, internet and recruitment agencies.

Both Local and Foreign National applicants are rigorously checked prior to being employed by the company. Our checking and verification procedures ensures that prospective employees are suitably qualified, experienced and have the necessary qualities to work unsupervised in the offshore environments.

All employees are provided with social security benefits and private health and accident insurance which provide cover for health care, in addition employees who work offshore or travel outside our home base are provided with special travel health care.

9.0
Key Personnel

Key Personnel

The following are the key personnel who provide technical expertise, experience and direction to MIAC Services.

Name	Photos	Position	Nationality	Duties
Jeffrey Hulse		Operations Director	British	System Design, Manufacture and Offshore Operations
Jintana Sukkhang		Financial Controller	Thai	Financial and Commercial control of the organization
Kroekphon Chaiwattananon		Engineering Manager	Thai	HVAC & Refrigeration Design, Systems & Manufacturing.
Preechapon Vejruk		Senior Project Manager	Thai	Project Planning and Execution
Somkid Girdpra		Offshore Manager	Thai	Onsite activities installation and commissioning
Mike Castlehouse		Drawing Office and Technical Manager	British	Control of Drawing Office and Product Envelope Design
Bowon Punyaying		Electrical& Instrumentation Manager	Thai	Control systems design, programming & commissioning

Kingkan Lintongkum		Procurement Officer	Thai	Materials Purchasing and Logistics
Mary Jane Bermudez		QHSE and Documentation Engineer	Filipino	Responsible Quality, Health & Safety and Environmental/ Document Indexing and Quality
Rungwiwat Pirunrat		Product Engineer	Thai	Responsible for complete product, material selection and procurement.
Mayuree Sawaengdee		Document Controller	Thai	Control and Transmittal of Documentation

Gallery

	Installation & Commissioning PLOCPP2 CUEL Thailand
	38kW Double Stacked AHU Chim Sao PTSC Vietnam
	Stainless Steel Ductwork KUPE TNS Thailand
	Commissioning FPSO Vincent Keppel Singapore

	205kW Packaged Unit Chevron Platong AOS Malaysia
	38 kW Air Cooled Condensing Units Chim Sao PTSC Vietnam
	Chilled Water Pump Repairs FPSO Vincent Keppel Singapore