Oil & Gas Case History

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<table>
<thead>
<tr>
<th>Unit Type: HVAC System</th>
<th>Project Name: QUAD 204 – Glen Lyon FPSO</th>
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</thead>
<tbody>
<tr>
<td>Cooling Duty: No. 4 units up to 75 kW</td>
<td>Site Location: Schiehallion field – North Sea</td>
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<tr>
<td>Year: 2013</td>
<td>End User: BP Exploration Operating Co. Ltd.</td>
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**Brief Description:**

Manufacture of an integral Air Conditioning system composed by 4 x Close Control Air Conditioners (CCAC) in Downflow configuration served by 4 x Air Cooled Condensing Units (ACCU) and an HVAC coordination panel. The CCACs have an integral Local Control Panel, which monitors the whole unit operation and communicates with the HVAC panel. The system serves the HVAC plant of the Turret Equipment Room (TER) installed on-board the Glen Lyon FPSO. The Turret Equipment Room comprehends the LER and LIR; each one is equipped with a dedicated duty/standby (2 x 100%) indoor Down-flow Air Conditioners and two external Air Cooled Condensing Units. The switching between the duty units and the back-up ones is managed by a dedicated HVAC panel, fully integrated with the entire vessel ICSS.

The new Glen Lyon is a revamping of an existing FPSO, constructed to improve the BP’s Quad204 project, which is re-developing the Schiehallion and Loyal fields.

The Glen Lyon FPSO measures 270 meters long by 52 meters wide and 154 meters tall. It will be able to process and export up to 130,000 barrels of oil per day and store up to 800,000 barrels. [Source: BP]
Oil & Gas Case History

Unit Type: Air Cooled Condensing Unit (ACCU)  Project Name: QUAD 204 – Glen Lyon FPSO
Cooling Duty: No. 4 units up to 75 kW  Site Location: Schiehallion field – North Sea
Year: 2013  End User: BP Exploration Operating Co. Ltd.

Brief Description:
Air Cooled Condensing Unit, with totally enclosed construction to allow for installation in cold and windy environments. Final installation foresees a top hood that prevents the fans to be blocked by ice formation. The units are fully inspectable and foresee special provisions to ease the extraordinary maintenance.

Main characteristics:
- Power supply: 690V / 3 Ph / 60Hz;
- II 2G rated semi-hermetic compressors;
- Suitable for outdoor installation, in harsh environment and deluge areas;
- Electrical equipment with IP56 minimum rating;
- Anti-sparks axial fans, driven by Siemens motors provided of special features (ISO C5-M paint cycle, IP 56);
- Finned pack heat exchangers with copper tubes, copper fins, AISI 316L frame, painted against corrosion;
- Facilities to prevent ice accumulation, with custom made heat tracing system on air intake and discharge sections;
- Full AISI 316L construction;
- Fully maintainable equipment, with facilitated components extraction systems;
- Unit verification certificate by Notified Body, II 2G IIB T3.
<table>
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<tr>
<th>Unit Type</th>
<th>Close Control Air Conditioner (CCAC)</th>
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**Brief Description:**

Close Control Air Conditioners, with totally enclosed construction and on-board power and control panel. The PLC logic is fully implemented in the plant HVAC control system and dialogues with the vessel ICSS, via the HVAC coordination panel. Delivered airflow is modulated with the aid of a variable speed drive. The units are fully inspectable and foresee special provisions to ease the extraordinary maintenance, with access from top and front only.

Main characteristics:
- Power supply: 690V / 3 Ph / 60Hz;
- AISI 316L control panel enclosure;
- DX cooling coil with copper tubes, copper fins, AISI 316L frame and painted against corrosion;
- Compact design with minimum maintenance clearances required;
- Full AISI 316L construction;
- Fully maintainable equipment, with facilitated components extraction systems;
- Anti-sparks plug fans with IP 56, ATEX rated motors;
- Air intake F7 class bag filters;
- Onboard PLC: Siemens S7-400.
**Unit Type:** HVAC coordination panel  
**Project Name:** QUAD 204 – Glen Lyon FPSO  
**Cooling Duty:** -  
**Site Location:** Schiehallion field – North Sea  
**Year:** 2013  
**End User:** BP Exploration Operating Co. Ltd.

**Brief Description:**

The HVAC panel is a self-standing control cabinet dedicated to the monitoring and control of all the eight units composing the air conditioning system. It contains two redundant PLCs, each one with its own full touch display, showing the main parameters of all the units of both the LIR and LER systems. The PLCs implement a high capacity alarms archive and customized interface graphics, for an easier comprehension. It is totally integrated in the control philosophy of the vessel ICSS.

**Main characteristics:**

- Dual Redundant PLCs: Siemens S7-300;
- HMI Displays: 2 x 19” full touch;
- Indoor Installation;
- Schneider steel casing;
- Paint RAL 9001;
- IP 55.