

## Air Start Packages – Sakhalin Island

**APPLICATION:** LNG plant  
**LOCATION:** Sakhalin Island (Russia)  
**ENGINE:** Caterpillar 3612

### SOLUTION:

The compressed air system was designed for primary starting of a CAT 3612 emergency power generator located in an LNG plant. The environmental operating conditions with extreme temperature ranges of  $-36^{\circ}\text{C}$  to  $+35^{\circ}\text{C}$  was a major consideration in the selection of appropriate materials and components.

The system was required to give six 15 second cranking cycles and for operation in a Zone 2 environment. The compressor units were sized to give a refill time of the two 1000 litre air receivers within 15 minutes. The system was fitted with absorption driers and the compressors were installed inside thermal and sound insulation enclosures. All pipe work, valves and fittings were in stainless steel and the complete package was finished to an offshore paint specification. The finished system was delivered with full GOST certification.

**For more information contact a member of our Starting Sales Team on +44 (0) 121 511 0400**

# Sakhalin Island

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# Sakhalin Island



## Air Start Packages – Sakhalin Island

**APPLICATION:** LNG plant  
**LOCATION:** Sakhalin Island (Russia)  
**ENGINE:** Caterpillar 3608

### SOLUTION:

Two CAT 3608 emergency generator sets located on a jetty required separate compressed air secondary starting systems. Winter operating temperatures down to  $-36^{\circ}\text{C}$  had to be considered in the design of the packages.

The system was sized for six, 10 second cranking cycles and for operation in a Zone 2 environment. The main starting air receiver had a capacity of 1000 litre air and had to be refilled from empty within 15 minutes. The starting air receiver also fed a 100-litre instrumentation air receiver. The air compressors were heat traced, as were the stainless steel pipe work and valves. The PLC and system controls were housed in a stainless steel, explosion proof enclosure. The finished system was delivered with full GOST certification.

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### Air Start Packages – Pearl

**APPLICATION:**   GTL development  
**LOCATION:**        Middle East  
**ENGINE:**          Caterpillar 3616

**SOLUTION:**  
This starting system for a major international GTL development in the Middle East is the largest air package IPU Starting have designed and assembled. The complete system comprised two fully stainless steel 1900 litre air receivers storing air at 30 bar to start a CAT 3616 diesel engine emergency driven generator. The solution was coded to ASME VIII Div 1 and U stamped and featured both diesel and electric driven compressors for back-up.

This starting system, for a major international GTL development in the Middle East, is one of the largest air packages IPU Starting has designed and assembled. The complete system comprised two stainless steel 1900 litre, ASME VIII Div. 1 and 'U' stamped air receivers, storing air at 30 bar to start a CAT 3616 diesel driven emergency generator. The design featured a duty electric compressor and diesel driven standby compressor. All pipe work, valves and fittings in stainless steel and all instrumentation and electric components to Zone 2.

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# Pearl

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# Wintershall



## Hydraulic Start – Wintershall

**APPLICATION:** Generators  
**LOCATION:** North Sea (Dutch)  
**ENGINE:** Caterpillar 3512

### SOLUTION:

Wintershall, a wholly owned subsidiary of BASF, has been operating in the North Sea since 1965 and today operates a total of 26 platforms, 25 of them in Dutch territorial waters and one in German territorial waters. The company commissioned Pon Power, the Caterpillar dealer in Scandinavia to supply emergency generators for offshore operations.

Wintershall, a wholly owned subsidiary of BASF, has been operating in the North Sea since 1965 and today operates a total of 26 platforms, 25 of them in Dutch territorial waters and one in German territorial waters.

The IPU hydraulic start system was designed to provide a black start system capable of three consecutive starts of 5 seconds each. The complete system was designed in compliance with the Pressure Equipment Directive, which means the system meets essential safety criteria, has satisfied appropriate conformity assessment procedures and carries CE marking.

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## Hydraulic Start – Buzzard Field

**APPLICATION:** Offshore  
**LOCATION:** North Sea (UK)  
**ENGINE:** Paxman 12VP185

### SOLUTION:

The hydraulic starting system was designed for a generator being used as a multi-role generator for emergency, essential services and black-start operation with a prime function to start a 1000Kw fire pump motor.

The hydraulic starting system was designed for black start operation on a multi-role generator set being used for emergency and essential services with a primary function to supply power to a 1000Kw fire pump motor.

The IPU solution guaranteed three start attempts each with a five second duration and incorporated a manual start valve and an engine driven PTO pump. In addition the system was designed to meet the Pressure Equipment Directive (PED) which requires assemblies of pressure equipment to meet essential safety criteria necessitating a full risk assessment and design appraisal, all of which was reviewed and approved by Lloyds Register of Shipping before being CE marked. All materials used met the needs of the offshore environment including stainless steel and a special paint finish to Norsok N501 standard.

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## Hydraulic Start – Sakhalin Island

**APPLICATION:** Offshore  
**LOCATION:** Sakhalin Island (Russia)  
**ENGINE:** Caterpillar 3512 (Diesel)

### SOLUTION:

This hydraulic solution was designed as a secondary start unit for a CAT 3512 engine installed at the Russian mainland export terminal. During the winter, ambient temperature can be as low as -40°C. As a consequence, equipment operating in this hostile environment needs to be capable of withstanding and performing at this extreme temperature.

The system configuration comprises two separate hydraulic start packs each with a capacity for three start attempts. In manufacture all hydraulic components were fitted with low temperature seals, accumulators were fitted with low temperature bladders and a special Arctic grade oil selected to cover the wide variations of temperature to be experienced. Component such as gauges, pressure transmitters and valves were carefully selected with this temperature in mind. IPU Starting prepared all documentation for the GOST technical passport necessary for each system.

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## Hydraulic Start – Ice Challenger

**APPLICATION:** Ice Challenger  
**LOCATION:** Bering Strait (Between USA & Russia)  
**ENGINE:** Perkins 1006

### SOLUTION:

Ice Challenger 'Snowbird 6', was an amphibious vehicle designed and built by Steve Brooks with the aim of setting a new world record by crossing the frozen wastes of the Bering Strait. The vehicle was powered by a 6-cylinder diesel engine, which incorporated an IPU hydraulic starting system.

IPU Starting designed the system so that the team could start the engine at -40°C and if for any reason the first attempt to start failed, the system could be manually recharged for further start attempts.

Previous attempts by Ice Challenger to cross the Strait had been hampered by the use of conventional battery starting, which were totally unsuitable for immersion in seawater and the sub zero temperatures that meant the team faced a two-hour process of starting the diesel engine, having to thaw out the electric starter motor by heating the engine block.

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