



International  
ESBI Energy Innovation

# ESBI O&M Solutions

World Class Operations and Maintenance



## ESBI O&M Solutions Power Plant Portfolio

ESB International provides world class operations and maintenance solutions to the power sector worldwide. Our focus on enhanced performance and efficiency ensures we consistently deliver high levels of availability and profitability for our clients.

ESB International (ESBI) is part of ESB, the Irish power utility with a proven track record of investment, ownership and operation of power plant assets since 1927. ESB is Ireland's premier power utility and owner of over 4,000MW of generating capacity in Ireland.

ESBI is responsible for the non-regulated business of ESB and develops, owns and operates power plants in Ireland and overseas. To date, ESBI has completed projects in over **115 countries**. The extensive expertise gained in our 80 year history has been the basis for the Operations and Maintenance (O&M) and engineering services provided to clients worldwide in the power utility business.

Our expert team, optimises the efficiency and performance of over 5,500MW of plant around the world, ensuring the highest levels of plant performance.

### ESBI Values

Inherent in all aspects of our business are the highest safety standards. Its management and continual improvement are an integral part of all our activities.

We are also committed to delivering world class business operations to the highest standard of quality, with full consideration for sustainability and the environment.

Our values, embodied in our organisational culture, govern how we conduct our daily business. Three core values **adaptability, commitment** and **progressiveness** define how we do business and the standards we maintain.

### Countries we currently have operations in:

Ireland  
Northern Ireland  
England  
Spain  
Pakistan  
Malaysia

### Countries we previously worked in:

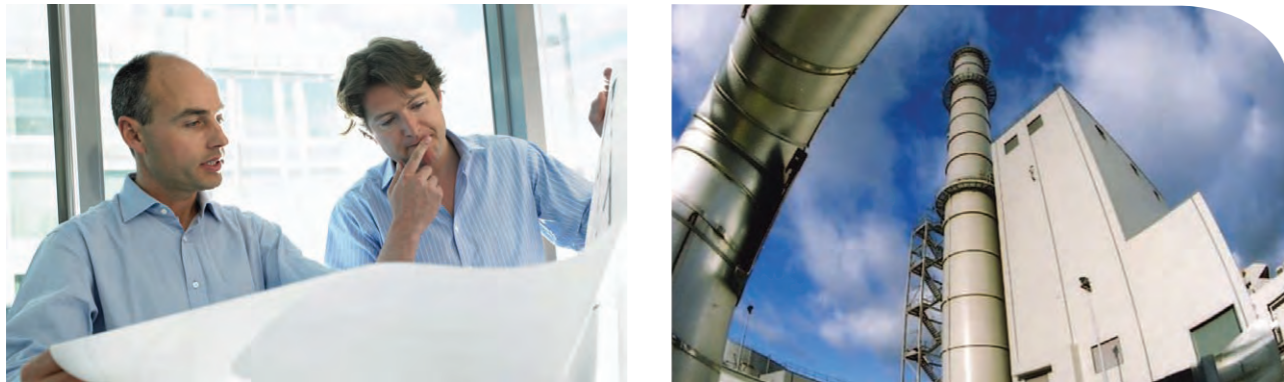
Abu Dhabi  
Ghana  
Oman  
Indonesia  
South Africa  
USA



# ESBI O&M Service Delivery

## Achieving Optimum Performance

ESBI O&M Solutions adopts a tailored approach to the delivery of services, geared for optimal performance over the lifetime of the asset. We customise our range of solutions to the needs of our customer to include initial project support, mobilisation, technology and knowledge transfer.



### MOBILISATION

The principal objective during mobilisation is to ensure that the ESBI O&M Solutions team has all the necessary skills, competencies, systems and procedures to take full responsibility for the plant from Commercial Operation Date.

#### Key activities include:

- Establishing plant O&M organisation
- Staff training and development
- Reviewing all plant O&M requirements
- Plant familiarisation
- Installing and populating all systems e.g. maintenance management system
- Involvement in plant commissioning activities
- Developing year one O&M plan and budget

### OPERATIONS AND MAINTENANCE

Full O&M services commence on the Commercial Operation Date when we assume full care, custody and control of the plant. The principal objective is to deliver the required plant performance that ensures achievement of the Owner's business objectives.

#### Key activities include:

- Day-to-day operations and maintenance – delivering world-class performance
- Performance monitoring, diagnostics and efficiency enhancement
- Management of all maintenance contracts including Long Term Service Agreement (LTSA)
- Market operations and trading interface
- Spare parts management
- Overhaul management
- Plant improvement projects
- Supporting development of an asset management strategy
- Management of O&M budgets and costs

### TECHNOLOGY AND KNOWLEDGE TRANSFER

ESBI O&M Solutions has extensive experience of technology and knowledge transfer projects worldwide. The objective is to equip the local O&M team with the necessary knowledge and skills to deliver on the key performance objectives of the plant. This is achieved via transfer of knowledge and know-how from our staff to local staff. At the outset, we carry out a review of the skills and capabilities available locally and depending on the skill level, will recommend the appropriate number of advisory roles.

#### Key activities include:

- Competency assessment
- Skill transfer
- Follow-on support

### ADDITIONAL SERVICES

We also offer O&M consulting services such as operational audits and organisational and performance reviews.

### AN INTEGRATED APPROACH

#### Health, Safety and Environmental Management Systems

All plants are operated under the ESBI Integrated Business Management System (IBMS) which covers all areas of power plant operations and maintenance. This comprehensive management system links all aspects of safety, environmental, operational, commercial and administration systems to ensure the efficient and effective flow of information. The IBMS is certified to ISO 9001, ISO 14001 and OSHAS 18001.

# ESBI Engineering Support Services

## Cost Effective Solutions and Expert Advice



### Fully Supported Portfolio of Services

ESBI has a resource pool of over 500 engineers. This includes specialists available to provide expert solutions for any power plant issues that may arise. Our advice is proactive, informed and independent.

ESBI technical experts draw upon years of experience which is reinforced and developed through ongoing engagement with Original Equipment Manufacturers (OEM) and attendance at technical conferences and user groups.

### ESBI O&M Solutions provides a complete range of technical services including:

#### Boiler and Combustion

- Boiler design and operation
- Inspection programmes (boiler and boiler auxiliary plant)
- Remnant life assessment

#### Turbine Technology

- Turbine plant maintenance
- Turbine plant operation and design
- Failure investigation

#### Generator and Electrical Engineering

- Plant assessment and condition monitoring
- Transformer diagnostics, including oil analysis
- Switchgear and excitation systems

### Control and Instrumentation Services

- Equipment review
- Control system design
- Specialised C&I systems

### Materials Assessment Services

- Plant inspections and structural integrity assessment
- Metallurgy
- Welding consultancy

### Plant Chemistry

- Chemistry control
- Audit of chemical safety and chemistry data
- Chemistry management reviews

### Thermal performance

- Thermodynamic engineering
- Performance evaluation
- Efficiency awareness training

### Environment

ESBI's Environmental team provides a full range of environmental services including services for power plant development and operation. In the operating phase the team supports the establishment of environmental management systems, waste management programmes, environmental auditing and ISO 14001 accreditation and supports the delivery of continuous improvement in this area.



# Delivering Real Value to Our Customers

ESBI's O&M Solutions team is led by the needs of our customers. ESBI, as a power plant investor in its own right, has a clear understanding of those needs. Working closely with developers and owners, we identify their specific objectives and develop the necessary O&M solutions to meet those objectives.

ESBI's excellent track record combines our utility perspective and experience with our commercially focused, performance driven approach. Our core strengths ensure the successful delivery of O&M solutions which meet our customers' goals for their power business.

## 1. Performance and Availability – strong track record

We operate a shared risk model which ensures that the performance and availability of our customer's plant is optimised throughout its working life. ESBI's O&M plants have high availability and low forced outage rates. Our teams have an excellent track record of delivering major maintenance events on time and to budget.

## 2. Expertise – proven specialist team

Our ESBI O&M staff are drawn from the same pool of experts we trust to operate and maintain our assets within ESB. These highly trained specialists have experience across a range of plant technologies and fuel sources, and work with our customers to develop the appropriate O&M strategy for their business.

## 3. Commercial Focus – delivering competitive advantage

ESBI has first hand experience of the challenges facing plant owners operating in highly competitive markets. This focuses our methodology and implementation approach to continually improve our customers' competitiveness and increase their commercial returns.

## 4. Independent Advice – impartial and expert

We are not tied to any supplier or OEM. The expertise developed working with customers worldwide means we challenge supplier proposed solutions and offer independent advice that maximises competitive advantage and profitability for our customers.

## 5. Flexibility – global experience, broad technological expertise

With projects successfully completed in Europe, Middle East, Africa and Asia, ESBI has proven its ability to deliver projects successfully across the globe. We also have experience in a wide range of electricity generating technologies and energy sources, including coal, oil, gas, wind and hydro.

## 6. Synergies across Our O&M Portfolio – integration of best practice

Our objective is to foster best practice sharing across our portfolio of plants. By transferring knowledge, exchanging experiences and learning from each customer site we continually improve power plant performance and increase efficiency. All plants have standardised systems, procedures and policies which enable us to benchmark and measure performance across different power plants.

## 7. Safety – a priority worldwide

We are fully dedicated to the health and safety of all people involved in our company's activities. It is a core value that is driven through all aspects of our business. We have an excellent safety performance record in the plants that we operate worldwide.

## 8. Customer Focus – understanding your needs

Listening, understanding and responding to the needs of our customers is a core value of ESBI. We strive to offer the highest levels of service supported by our systems, processes, training and customer driven culture.



# ESBI O&M Reference Sites

Our capability in power plant O&M is based on our experience as an operating utility and our proven track record of operating and maintaining power plants internationally. A selection of our success stories are listed below.

## 1. Amorebieta 755MW Combined Cycle Gas Turbine (CCGT) Spain

Amorebieta was the first internationally owned power plant to be developed in Spain, with a capacity to supply 30% of the Basque Region's energy requirements. ESBI manages the operations and maintenance of this 755MW plant, which uses GE 9FA technology. It is jointly owned by ESBI and Osaka Gas of Japan.

## 2. Coolkeeragh 400MW CCGT Northern Ireland

ESBI owns, operates and maintains the Combined Cycle Gas Turbine plant at Coolkeeragh, the first in the Northern Ireland competitive market. The 400MW plant uses GE 9FA technology.

## 3. Corby 350MW CCGT United Kingdom

Corby power plant was one of the first independent power plants (IPPs) to be constructed in the deregulated UK market and is one of the strongest performing two-shift plants in the UK. The plant uses GE 9E gas turbines, and is 50% owned by ESBI in a joint venture with E.ON.

## 4. Dublin Bay Power, 420MW CCGT Ireland

This plant is owned, operated and maintained by ESBI and is the most efficient unit on the Irish national grid. It is one of the first IPPs to be constructed in the deregulated Irish market. The plant uses a single-shaft Alstom GT26 gas turbine in combined cycle.

## 5. Manjung 2100MW Coal-fired plant Malaysia

ESBI provided O&M services for this coal-fired power plant (comprising of 3 x 700MW units using Alstom technology) during its first 28 months of operation, and is providing technical services for a further two years. The plant is owned by a subsidiary of TNB, the Malaysian National Utility.

## 6. Kulim 220MW CCGT, Kulim High Technology Park Malaysia

ESBI's role in Kulim Park development includes O&M services and project management. In addition to operating and maintaining the CCGT power plant and distribution system, ESBI is responsible for all activities associated with managing the utility including customer billing. The power plant uses GE 6B gas turbines. It is owned by Northern Utility Resources, a Malaysian company.

## 7. Uch 586MW CCGT Baluchistan Pakistan

ESBI has a long-term contract to operate and maintain the Uch 586MW power plant. The plant, which uses GE 9E gas turbines in combined cycle configuration, is fuelled by low-calorific natural gas backed up by distillate oil. It is owned by a consortium of which the major partner is International Power plc.

## 8. Rousch 412MW CCGT Punjab Pakistan

ESBI has a long-term contract to operate and maintain the 412MW combined cycle plant at Rousch. Initially, the plant, which uses Siemens V94.2 gas turbines, was fuelled by residual crude oil transported to the plant from oil refineries in the south. A gas-fuel conversion project was undertaken to convert the plant to gas. The plant is owned by a consortium of companies of which Descon Engineering is the majority shareholder.

## 9. Peaking Power Plants, 208MW Ireland

Peaking capacity plants were installed onto the Irish national grid in 2003 and 2004 and are used to provide peak power. The plants use Pratt & Whitney FT8 units, each with two 26MW aero-derivative gas turbines driving a 52MW generator. ESBI provides O&M services for both those sites to the owner, Endesa.

## 10. Wind Power UK & Ireland

ESBI manages the ESB Wind portfolio of wind power plants in Ireland and in the UK. The wind farms comprise turbines of various ratings up to 3MW each and have been commissioned in stages from 1998. ESBI manages the wind-farms remotely and supplies site personnel to manage service and maintenance contracts.

We have also undertaken O&M projects in other locations such as Abu Dhabi, Ghana, Oman, Indonesia, South Africa and the USA.



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recycled wood or fibre

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