

# ABB High Power Rectifier Services

Here's the answer. What's your question?



**ABB**

# How can I guarantee future success?



With more than 100 years' experience, ABB is your guarantee of success in the future. Because whatever rectifier services and solutions you need, we have the answer. We know that a safe and reliable installation is essential to your success. And we know how to ensure safety and reliability for your complete rectification and power distribution system: from start-up and commissioning through its entire lifecycle.



“ABB take our concepts and turn them into an operational reality.”

Mike Sauer  
Charter Steel

Our aim is to secure your investment, and keep your assets operating at their highest levels of efficiency and reliability – so you can realise maximum productivity, and optimum plant performance.

Based on standardised designs, our customised solutions enable us to maximise economies of scale, speed of implementation and serviceability. We have the experience, the knowledge and the resources – all under one roof – to provide end-to-end support, from the AC utility to the DC bus powering your process.

Though every application is different, with our flexible approach and customised solutions, we can satisfy your unique requirements.

#### Who has the services I need?

Our portfolio of dedicated service solutions can be tailored to suit your needs. Our services include:

**Health Audit.** A detailed performance review of all major components of your rectifier system.

**Site Services.** Through our local service partners, we offer rectifier system repair, maintenance and services.

**Spares.** We provide a detailed list of recommended spares and can review your system spare parts inventory.

**Training.** With our depth of experience, we can provide your staff with the training they need to operate and maintain your systems at peak performance.

**Upgrades and Retrofits.** Our technology enhancements can improve the performance of your existing equipment.



# Is my system healthy?

An ABB Rectifier System Health Audit can assess performance, identify problems, and help you create a road map for upgrades or retrofits.

A typical ABB System Health Audit normally includes.

- Temperature measurements of components and connections
- Thermal scans
- Transformer oil sampling and testing
- Check and review of alarm and trip points
- Functional tests of critical control relay, overvoltage and overcurrent protections
- Measurement of power factor and harmonics
- General review of system performance against start-up data (where available)
- General performance review against customer requirements

As part of the health audit, a detailed report with recommendations will be provided.

## Why are my processes less efficient than they should be?

An ABB audit doesn't have to stop at the physical system. With our long experience in power rectification and conversion within the primary metals and chemicals production and refinement industries, we are also well qualified to review your entire DC power supply equipment.

So you can reach your targeted production levels and your energy consumption objectives.

## Does my rectifier transformer need replacing?

Your rectifier transformer is one of the hardest working elements of your entire system and any number of factors can reduce its life expectancy.

However, you don't want the expense of replacing your rectifier transformer if simple maintenance or repair could solve the problem.

So ABB offers transformer testing to establish the health of your unit. And having established its condition, we can carry out preventive maintenance, a complete tap changer service, a transformer overhaul or whatever repairs are required, to keep your transformer operating at peak efficiency, and to prolong its working life.

“ABB's experience and innovation helped achieve a 30% production increase.”

A. Karim Salimi  
Aluminium Bahrain

# How can I maximise my investment?



**Having invested heavily in your rectifying installation, you obviously want to achieve the maximum return on your investment, over the longest possible time scale.**

Your plant should be continuously monitored, and you should regularly examine the steps you can take, short of complete replacement, to enhance performance, efficiency and profitability.

Questions to ask include:

- How safe are the oil-cooled rectifiers?
- Am I getting the best return on the cost of my air-cooled rectifiers?
- Could money spent on maintenance achieve a better return?
- How much could I save through increased reliability and availability?
- Am I still getting an optimum return on my investment using the present control systems?
- How can new protection concepts be added?

As you would expect, ABB has the answers.

We are specialists in improving existing equipment, to extend its lifespan and maximise your investment. As a result of your own plant status checks, an ABB System Health Audit, a feasibility study, a functional test or a failure analysis, we can help identify upgrade and retrofit opportunities which will maximise your investment for the longest possible term.

## **Should I upgrade or retrofit?**

ABB has the capability to offer both upgrades and retrofits.

If you are considering an upgrade, you need to identify the objectives you hope to achieve, and the indicators of success. You should consider the price of the equipment, the expense of downtime, the long-term productivity, and the return on investment.

The retrofitting alternative involves adding something to your existing equipment, to improve its performance and compensate for the inevitable deterioration which began as soon as it started to operate.

## **Can I upgrade my rectifier bridge?**

Older rectifier designs use closely matched semiconductor power devices such as diodes and thyristors. Semiconductor manufacturers, and even the original rectifier manufacturer, may no longer be able to supply such closely matched devices.

Component ageing can cause deterioration in contact resistance, failed fuse components or snubber circuits, or may degrade the power structure of the rectifier in other ways. Spare parts may no longer be available.

However, complete replacement is not the only option.

ABB offers a range of customised services, to help extend the life and increase the reliability of your existing rectifier bridge.

# Is my control system the best I can get?

**If your rectifier control system is ageing, you will be finding it increasingly difficult and costly to service and to find spare parts. Many electronic components found on older analogue and digital circuit boards are simply no longer available.**

However, an upgrade to ABB's AC 800PEC control platform will reduce maintenance costs and improve control, servicing and troubleshooting.

The AC 800PEC offers a range of built-in, state-of-the-art diagnostics tools. It also features an optical connection to make it easy to access your process. With a microsecond cycle time, speed is dramatically increased, and Matlab/Simulink instead of C/Assembler greatly enhances control development efficiency.

Web-enabled, and with connectivity to any commonly used field bus, the AC 800PEC not only provides full Industrial IT level 2 integration – maximising your productivity and performance – but also removes the problem of dwindling support and replacement parts for your existing, outdated rectifier control.

## **Predictive diagnostics**

The AC 800PEC provides increased serviceability using predictive diagnostics through extensive rectifier monitoring and overall system supervision. Monitoring parameters including Thyristor temperature, DC current, DC voltage and primary voltage mean multiple traces and trends can be plotted.



There is also provision for internet-based remote diagnostics.

## **How can I lower the cost of power?**

Depending on the terms of your power purchase agreement, you are almost certainly being charged high fees for excessive VAR consumption. Your injection into the utility grid from your plant will also be subject to maximum allowed harmonic distortion requirements.

Rectifiers, drives and other power electronic equipment typically generates system harmonics and contributes to lowering the system power factor. This not only has an impact on the cost of purchased power, but also on the reliability of the system and the life of the equipment. System upsets and



“The technical assistance from ABB has been excellent”

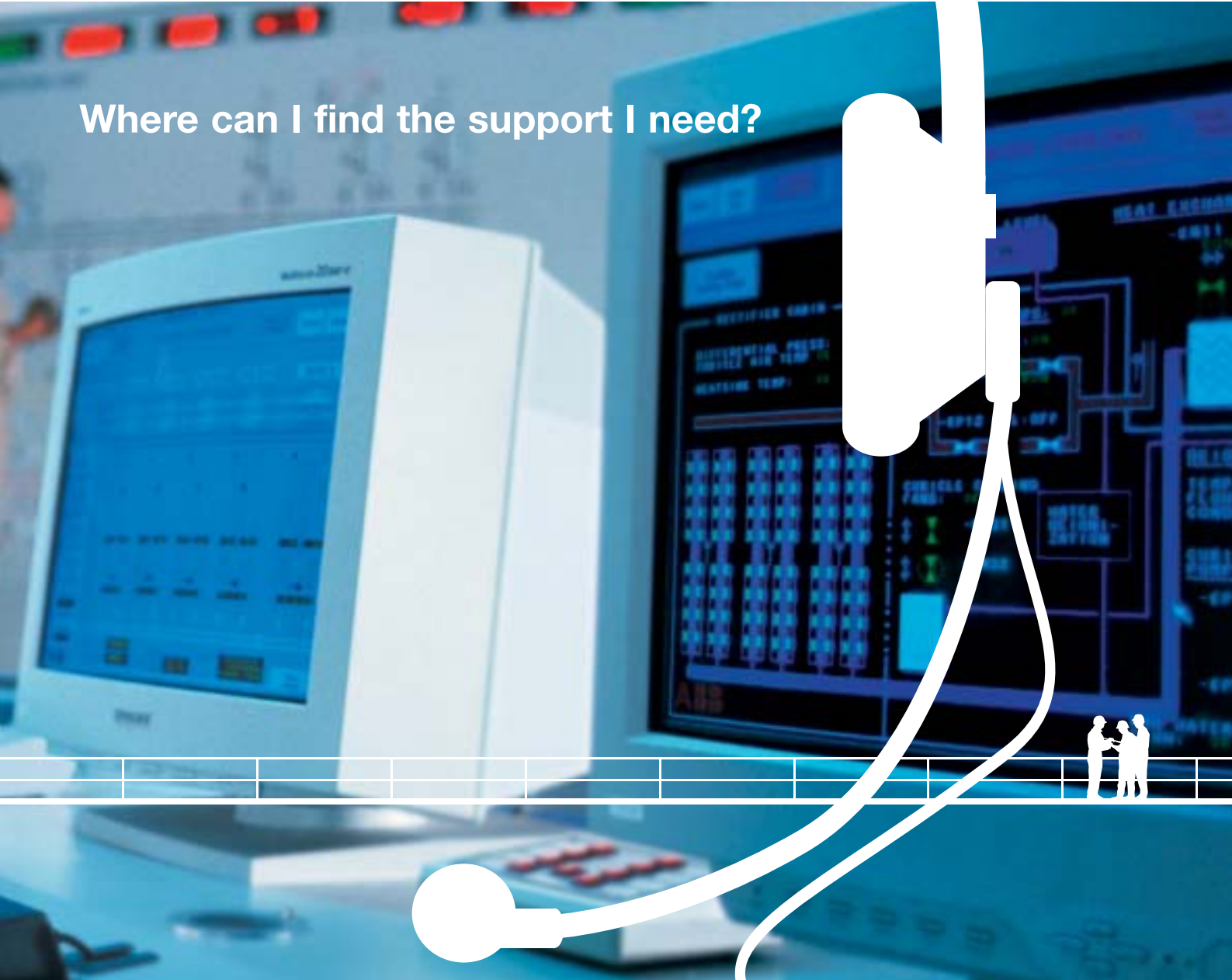
Miguel Melendez  
HYLSA

equipment failures within the plant can also occur as a result.

ABB offers a range of system studies and simulations, using the latest advanced simulation tools. We can conduct basic system assessments, or complete and comprehensive plant-wide system studies.

After analysis of the results, we can provide the necessary system solutions, whether you require harmonic filtering, switched capacitor banks or static VAR compensators. We can also make any modifications to the existing equipment which may be needed, so that your harmonics, system resonance and power factor issues are resolved, and your power purchase costs are reduced.

# Where can I find the support I need?



**Whether you simply need occasional training, or you wish to outsource your entire service requirement, ABB has the answer.**

An ABB Service Contract offers complete flexibility and cost-effectiveness. From training via the ABB University, to on-line troubleshooting, and from preventative maintenance to emergency site visits, we can tailor our service to your needs – to help you realise the benefits of our expertise in products, systems, applications and processes.

#### **Who'll help out at 3am on a Sunday?**

Our Priority Hotline Service operates 24 hours a day, 365 days a year, giving immediate access to our highly trained rectifier support engineers. With an upgrade to the ABB AC 800PEC

control platform, you can benefit from significantly enhanced diagnostics, 24 x 365 on-line support, and remote diagnostic capability.

#### **How can I be sure I have the spares I need?**

Availability of critical spares is a key element in reducing Mean Time To Repair. We provide a detailed list of recommended spares, and can help you review your system spare parts inventory: so you can reduce unnecessary holdings, but ensure you have the right parts available when you need them.

#### **ABB Service Road Map**

**With ABB's commitment to high quality service you can be assured of increased availability of your plant with a reduction in unplanned downtime.**

**We call this the Service Road Map. Over the long term it will standardise your power circuit configurations, control platforms, maintenance protocols, optimise the handling of spare parts and provide for training and health audits.**

**This all leads to reliable and safe DC power supplies for the entire system's life cycle.**



### **All you need to know**

For comprehensive rectifier service, advice or information on any aspect of your rectification system, please contact ABB.



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