

## power system protection service

ensures optimum performance of power system  
protection schemes

ERA Technology offers a comprehensive protection service for new and existing utility, industrial, off-shore and commercial power installations. The service spans working voltages from EHV to LV and includes:

- protection system design
- device selection
- specification
- application
- grading studies
- relay setting schedules

## the importance of reliable protection

A reliable protection scheme is essential for the safe and economical operation of any power system. Protection equipment that fails to operate or discriminate correctly under fault conditions can have serious implications for the power system through increased disruption, system damage and risks to site personnel.

## existing plant

In the case of an existing plant, the service usually starts with comprehensive protection audit. A protection audit provides an effective assessment of a company's power distribution system without a commitment to a full-scale power system study. The service minimises the impact that a failure could have on its business by regularly reviewing the protection co-ordination of its power system - particularly after changes have been made to it.

ERA Technology's power system protection service can help reduce these risks and provides the following benefits:

- reduced outages and equipment damage
- reduction in site hazardous conditions (i.e. increased safety for site personnel)
- effective use of existing circuit protection
- independent, expert advice on system modifications
- improved protection philosophies
- maintenance of system integrity
- on-going support



# site survey and data collection

A site survey is conducted by experienced ERA engineers in order to collect the protection data using a well-established methodology tailored to the site layout. Typically the survey includes a visit to all major switchrooms. Pro-form data sheets are used for collecting the information either directly from site equipment or from existing site records.

# protection service for new plant

A protection philosophy is developed based on the system requirement. Protection scheme design and device specifications are derived from this philosophy. Relay settings are calculated in order to provide optimum protection for the plant and site personnel. If the protective devices are already specified, then the adequacy of their application will be verified and settings provided.

# protection analysis report

Protection co-ordination studies are conducted using ERACS - a power system modelling software program developed by ERA. Calculations are carried out for the main and unit protection devices (such as distance and differential relays) applied on generator, motor, transformer and transmission/distribution networks. These calculations are carried out in accordance with the BS and IEC standards to validate the existing settings (or to provide settings for new plants).

The protection studies for a new plant or an existing plant are fully documented in a report with the following:

- protection philosophy
- site survey record (if required)
- network diagrams for each section studied.
- existing and proposed protection grading curves
- methodology and setting calculations for unit protections
- methodology and settings for system control (eg auto-reclosing on transmission and distribution system)
- existing and proposed relay setting schedules

For further details of ERA's power system protection service, please contact either:

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# why ERA?

ERA's engineers have extensive knowledge and experience that has been achieved through undertaking studies for a diverse range of industries. Therefore, the company is well placed to provide a prompt, comprehensive and cost-effective service, tailored to client's requirements. As an independent organisation, ERA's impartiality and power systems expertise is widely recognised within the electrical supply industry. ERA can assist in technical discussions with Distribution Network Operators and also with national and international recognised experts. ERA takes a leading role in the development and application of standards and regulation.

# ERA Technology

ERA Technology works at the leading edge of many advanced technologies. The business was founded in 1920 and today provides specialist, high value-added, technology-based services including design and development, testing, assessment and expert advice.

The company has built an international reputation for technical expertise through constant innovation at the leading edge of technology. ERA's services reduce technical and commercial risk, improve the operational performance of engineering infrastructure assets, and enhance the competitiveness of products and systems

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