THE BACKGROUND
Our client identified an urgent need to address issues following an electrical incident on site. GSE responded quickly and mobilized a team to address deficiencies in switchgear design and to project manage remedial required work across a variety of the client’s sites in the UK.

THE CHALLENGE
GSE Systems was requested to significantly reduce the risk of fire and explosion by the phased installation of complex, high-integrity systems on operating sites, including integration with existing systems. As an augmented service, full asset lifecycle support, documentation and associated services have been supplied by GSE.

Arcing, overheating and, in some cases, electrical leakage currents, can cause fire or explosion by igniting flammable materials. This can cause death, injury and considerable financial loss.

Services provided by GSE Systems:
- Project management
- Specification and procurement of materials
- Detail of design
- Calculations to verify that installed system meets SIL requirements
- Specification of high-integrity logic solver (Emerson Delta V System) together with associated acceptance tests
- Specification of installation, test and commissioning
- Site supervision
- Operator training
- Independent third party review
THE SOLUTION

Our client requested GSE implement a fast-track process to address the perceived deficiencies identified by the RCA. An improvement plan based on GSE findings and risk-based priorities was developed and agreed with the client. GSE was able to mobilize two task forces:

The Design Group

- Detailed site survey
- Provision of plant records
- Electrical modelling using SKM Power Tools™
- Fault level studies
- Protection grading studies
- Arc flash incident energy and flash protection
- Boundary calculations
- Arc flash risk assessment
- Implementation of plant labelling
- Provision of appropriate PPE
- Training (operator and electrical technician)
- Design of switchgear modifications
- Project management and supervision
- Modification work throughout the UK

The Electrical Systems Management (ESM) Group

- Gap analysis of existing procedures and safe systems of work against statutory requirements, ACOPs and best practice
- Enhancement and development of procedures to address deficiencies
- Training needs analysis (TNA) for operators and technicians
- Delivery of appropriate training
- Competency assessment
- Authorization of personnel against electrical safety rules
- Duty holder provision and support

The task forces tackled all of the work in a collaborative and open manner, working closely with all parties involved. This significant piece of work was completed in the four months following the incident and on budget.

THE BENEFITS

- An improvement to the safety of all company employees
- Reduction of risk to the business
- Compliance with regulatory duties imposed upon employers
- Improved plant reliability
- Ongoing support provided by GSE on an annual basis

With the completion of this project, GSE helped to improve the safety of all company employees, reduce risks to the business, and improve plant reliability.
Each year about 20 people die from electric shock or electric burns at work and about 30 die from electrical accidents in the home. Most of these accidents are preventable and this book is intended to help you avoid such accidents. Many people have had an electric shock at some time or another without lasting injury, but this does not demonstrate immunity, merely the unpredictable nature of the risk. Slightly different circumstances could have resulted in death. If the victims of electric shock do not die, they usually recover very quickly unless there are other injuries (such as burns) or consequential injuries such as strained muscles from sudden contraction during the shock or injuries from, for example, falling as a result of the shock.

Electric shock is not the only hazard. Where electrical arcing occurs, perhaps as a result of accidental short circuit, the heat generated can be intense and, even if it persists for only a very short time, it can cause deep-seated and slow-healing burns. Engineers and craftsmen often fail to appreciate the very real risk of injury that can arise from arcing. As a result, there are several hundred serious burn accidents each year arising from unsafe working practices. The intense ultraviolet radiation from an electric arc can also cause damage to the eyes.

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Most electrical accidents occur because people are working on or near equipment that is thought to be dead but which is live; known to be live but those involved do not have adequate training or appropriate equipment, or they have not taken adequate precautions.
ABOUT GSE SYSTEMS

We are a next-generation simulation, training, and engineering services provider applying a world of experience to help you achieve the performance you imagine. GSE is a world leader in real-time high-fidelity simulation, providing a wide range of simulation, training and engineering solutions to the energy and process industries. Our comprehensive and modular solutions help customers achieve performance excellence in design, training and operations. GSE’s products and services are tailored to meet specific client requirements such as scope, budget and timeline.

CONTACT US

Worldwide Headquarters
GSE Systems, Inc.
1332 Londontown Boulevard, Suite 200
Sykesville, Maryland 21784 USA
T: +1 410.970.7800
T: 800.638.7912 (U.S. only)
F: +1 410.970.7997
E: info@gses.com
www.gses.com

USA – Georgia
2300 St. Marys Road, Suite D
St. Marys, Georgia 31558
T: +1 912.576.6730
F: +1 912.576.6734

USA – North Carolina
1135 Kildaire Farm Road, Suite 200
Cary, North Carolina 27511
T: +1 919.228.4044
F: +1 919.481.9255

Sweden – Nyköping
Repslagaregatan 43 A
Nyköping SE-611 32
T: +46 (0) 155.78.700
F: +46 (0) 155.28.97.77

UK – Stockton-on-Tees
Birch House
Princeton Drive
Stockton-on-Tees
TS17 6AJ
T: +44 (0) 1642.613.622
F: +44 (0) 1642.616.480

UK – Glasgow
Royal College Building
204 George Street
Room 4.01
Glasgow G1 1XW
T: +44 (0) 141.4411.494

China – Beijing
F3 Oriental Place
9 East Dongfang Rd.
North Dongsanhuan Rd.
Chaoyang District
100027 Beijing
T: +86 10.84518296
F: +86 10.84513269

India – Chennai
4 South Boag Road, T. Nagar
Chennai 600017
T: +91 (0)44.2433.3469