

### **Onshore & Offshore Service / Repair & Retrofit**

From Service / Refurbishment / Repair / Upgrade / Test / Commissioning and De-Commissioning, NCE Switchgear, Clydebank, Scotland has the in depth 30 year plus proven track record in the Marine & Offshore Market Sectors to support your needs.

NCE can provide **"Bespoke"** solutions to suit your electrical power system needs. From new project Design and Manufacture of IEC Arc Type Tested Low Voltage and Medium Voltage integrated switchgear, control and instrumentation, packaged as free standing or containerized to support your Off-Shore and/or Land based installations, we have the full package capability to support all of your project electrical power system commissioning and/or de-commissioning activities, from hardware refurbishment and safety validation, to the re-cycling of De-commissioned AC/DC Power Switchgear / Drilling and Propulsion Drives, together with associated control and instrumentation, we have the highly experienced and safety certified electrical and mechanical design engineering personnel to meet your requirements.



NCE highly experienced Service / Commissioning Team offer clients a tailored **"Bespoke"** Factory and / or On-Site Test capability, ranging from full factory inspection and function testing of LV and MV switchgear, drive and controls, to site installation test and commissioning.

### **Inhouse and Site Testing**

- Insulation Resistance Testing.
- Pressure Testing
- Earth Continuity Testing
- Current and Voltage Ratio testing
- Protection Discrimination and Programming
- Control System PLC/HMI simulation
- VSD Setup and interface control
- Harmonic / PFC Study
- Arc Monitoring and thermal image testing
- Other

### **Classification Society 3<sup>rd</sup> Party Certification**

- Lloyd's
- DNV - GL
- ABS
- RINA
- BV
- RMRS
- Other ( GOST ) on request



**NCE Service**

NCE Service division, provide a comprehensive package to ensure the critical uptime for all types of switchgear.

With our fully qualified and industry experienced team NCE Service are the first choice partners for all aspects of increasing the longevity of switchgear in an increasingly health and safety focused environment.

NCE Service offer technical support and maintenance for all 3rd party switchgear, from obsolescence management studies, site surveys, bespoke upgrade solutions, extensions, to 3rd party legacy designs

With a dedicated engineering support team offering 24/7 telephone assistance in the protection of people and assets, and fully flexible on site approach able to offer 24/7 planned call out services.

NCE's offer fully type tested designs to the latest international standards, Inc, IEC, ANSI, CAS and Marine Classification Society Rules.

NCE Service division can apply all of these services at any stage of the switchgears lifecycle, with a full and comprehensive report including detailed analysis and conclusions for the most cost effective approach to maximising uptime, MTBF, safety and security with scheduled interruptions to supply.

**Extensions**

**Replacement switchboards, extensions or refurbishment. Destruct of existing systems is considered during the survey scope with detailed costed proposals for removing existing systems sections and the installation of new switchboards, location of any bulkheads that may need to be cut for the installation phase along with any potential obstructions – restricted landing areas, ducting, ladder rack, pipe-work.**

## **NCE Service Personnel Skill Base**

- LV and MV Generator / Transformer Power Switchgear Distribution Systems.
- Fault Finding, Diagnostics, strip down and repair and maintenance of ACB's.
- Generator Control Systems, inclusive of Governor and AVR systems interface.
- Power Management ( PMS ) interrogation, upgrading and/or replacement.
- DC Drilling Drive SCR Switchboards and PLC control system upgrades.
- AC Drilling Drive IGBT Switchboards and PLC control system upgrades.
- Propulsion Drive Switchboards fault finding and diagnosis.
- Driller and Mud Pump Console purge and / Intrinsic Safety ( IS ) systems upgrades.
- Circuit Breaker inherent protection and/or discrete digital protection schemes.
- Systems Digital Protection, PLC/HMI/SCADA programming and system fault finding.
- Air Circuit Breaker Replacement / Retrofitting of obsolete breaker replacement.
- Main Bus Bars Replacement / Modification / Re-Work / Extension.



**Leg Jacking**





## Retrofit



Retrofit solutions can be a cost effective and highly efficient process ensuring legacy switchgear is compliant with current legislation.

NCE Service division can offer a total solution, from detailed analysis to (ISO9001-2008) 3D design, full in house manufacture, assembly, and test, with a dedicated site team providing peace of mind installation and commissioning.

With extensive experience of retrofit conversions NCE Service division can provide full compatibility retrofitting current ACB's for legacy ACB's.

From simple relays, meters, MCCB's, to up rating busbars, NCE Service can provide a one stop shop.

Legacy ACB's can be retrofitted with any current manufacturer of ACB's, using NCE Service division's unique designs.

With 3 systems for retrofit solutions NCE Service will provide a tailored system for minimum downtime, and maximum efficiency.

Legacy Copperwork	Legacy Copperwork	Legacy Copperwork
Legacy Chassis	Legacy Chassis	Modern Chassis
Modern Chassis	Modern FX ACB	Modern ACB
Modern ACB	Modern ACB	Modern ACB
<b>System 1</b>	<b>System 2</b>	<b>System 3</b>

## Upgrades

## **Systems Experience**

- Bauteil MI and MKII DC ( SCR ) Drives
- Hill Graham DC Drives
- Ross Hill DC Drives
- Control Techniques Mentor DC Drives
- Siemens AC & DC Drives
- Rockwell AC Drives
- Converteam / GE MV3000 Drives
- Texas instruments PLC systems
- GE Fanuc 80.35 PLC systems
- GE Fanuc PACS Systems RX3i systems
- Siemens S7
- Rockwell 1756 PLC Systems
- GE Multilin Gen/Fdr Protection Relays
- Schneider Sepam Protection Relays
- Areva Micom Gen/Fdr Protection Relays
- ABB Relion Gen/Fdr Protection Relays
- Basler AVR systems and protection
- Woodward Governor / AVR control
- Other



## **NCE Service Proven experience :**

### **Project Management**

- Resource planning in accordance with client commissioning de-commissioning schedules.
- Controlling and maintaining Security, HSE, Off-shore Survival Training.
- Controlling personnel Medical Certification.
- Production of site safety plans and associated risk mitigation training.
- Attendance at coordinated client meeting On-shore / Off-shore.
- Production of Functional Design Specifications.
- Production of Design General Arrangements, electrical schematics and schedules.
- Production of Bill of Materials.
- Production of Inhouse and site test procedures and schedules.



**RAPID RESPONSE SWITCHGEAR SERVICES,**

TROUBLESHOOTING COMBINED WITH EXPERT FLEXIBLE RESPONSE TO MAXIMISE YOUR EQUIPMENT UPTIME.

Fast and Efficient 24/7 Emergency Service and Repair **HOTLINE** can help.

CONTACT US 24/7 on +44 (0) 141 952 1166



**GLOBAL FAST RESPONSE SUPPORT:**

- SITE SURVEYS & ONSITE TECHNICAL SUPPORT
- TROUBLE SHOOTING & FAULT DIAGNOSIS
- BESPOKE TESTING & CURRENT INJECTION
- THERMAL IMAGING DIAGNOSTICS
- REPAIR & REPLACE
- ANNUAL/BESPOKE MAINTENANCE
- CLASSROOM & HANDS ON TRAINING
- SPARE PARTS & SUB ASSEMBLIES
- ASSET OBSOLESCENCE UPGRADING
- INSTALLATION
- POWER & HARMONICS ANALYSIS



With our fully qualified and industry experienced flexible support team NCE Switchgear Engineering are the first choice partners for all aspects of increasing the longevity of switchgear in an increasingly health and safety focused environment.



**TEST & COMMISSION**

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**LV Site Maintenance**



**Thermal camera**

**Monitoring**

**Systems Digital Protection, PLC/HMI programming and system fault finding**



### **Site Design and Survey Services**

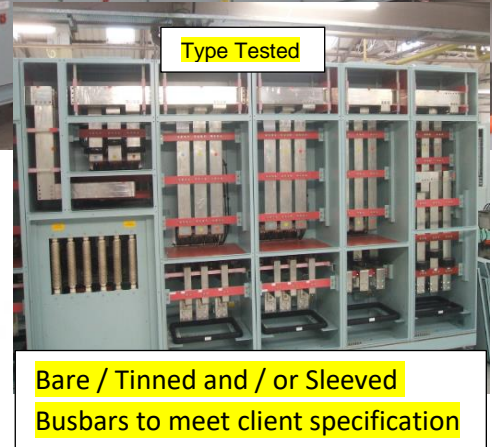
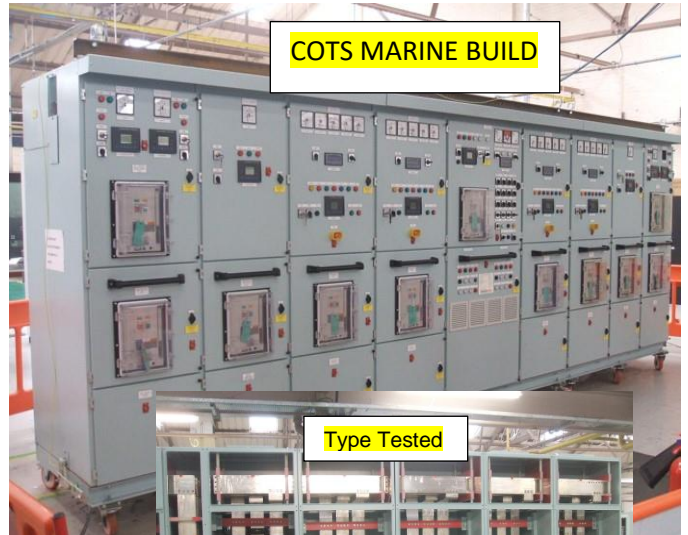
- Provision of Site Surveys c/w report and video/photographic hardware support.
- Provision of Site Surveys c/w obsolescence reports with hardware recommendations.
- Provision of Electrical Design, Service and Commissioning on site / off site training.
- Provision of Project specific commissioning / de-commissioning procedures.
- Provision of Technical client support, c/w on-site / off-site and/or inhouse training.
- Provision of Global 24/7 support.
- Provision of Annual preventative Maintenance and Site support contracts.
- Provision of **Arc mitigation** Solutions to **Protect Personnel** and **Prolong Swbd Assembly life**.

## NCE Arc Mitigation Retrofit Site Upgrade Solutions

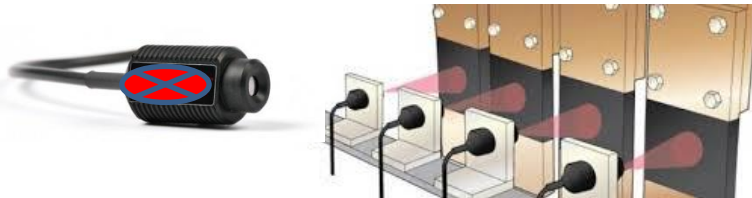
NCE can offer Ultra-Fast Earthing Switch solutions using fast acting detection and extinction electronic primary switching, as new, or as retrofit assemblies for site installation into existing non arc type tested assemblies > 690Vac 85kA / > 11kV 50kA to mitigate arc propagation and equipment damage due to overheating, ageing of insulation and mechanical wear, loose joints, moisture, dirt and corrosion, along with overvoltage and overheating problems.



Whether you require arc fault monitoring using fibre optic light detection or permanent Infrared Continuous Thermal Monitoring of Critical Electrical LV/MV Switchgear Connections : **Hotspot Detection** can be applied to detect electrical failure, NCE has an arc early warning and mitigation solution to suit your needs to lengthen the life of non certified switchgear, regardless of original switchgear manufacturer.



Bare / Tinned and / or Sleeved Busbars to meet client specification



Detailed Arc Mitigation Surveys can be provided by NCE to determine the best cost effective solution to our clients in relation to Assembly life enhancement and the ongoing safety of operational personnel.



Copper Solutions up to 120kA / 690V to suit complex Configuration or Restricted access.

Breaker & Arc Protection Sensing and site Upgrading using 2D/3D Modelling to match existing busbars



## **NCE New Build Arc Type Tested Solutions**

All NCE Company products are manufactured and Laboratory Type Tested to the latest IEC 61641-1 accompanied by IEC/TR61641 International Standards for Electrical Switchgear and MCC's in conjunction with related Low Voltage and EMC Directives.

NCE hold ISO9001: 2015 for the Design and Manufacture of LV and MV Switchboards, Certificate Number: FM 451 90

**NCE Switchgear and Motor Control gear construction meets the full Seismic requirements for the UK Nuclear Industry as tested by Element UK Test Laboratory.**

### ASTA Certified Systems

The Company has TYPE TESTED its switchboard systems to the following levels:

Busbar System:

- 50KA for 1 second and 3 seconds
- 65KA for 1 second
- 80KA for 1 second and 3 seconds
- 120KA for 1 second.
- 85KA for 1 second.

Incoming & Outgoing Cubicles & Fault Trip Test of:

- ACB's 1250A - 4000A
- MCCB's 125A - 800A



Withdrawable and Fixed Type MCC's:

- Type 2 Co-ordination 50KA (both Fuse / Contactor and MCCB / Contactor short circuit combinations)

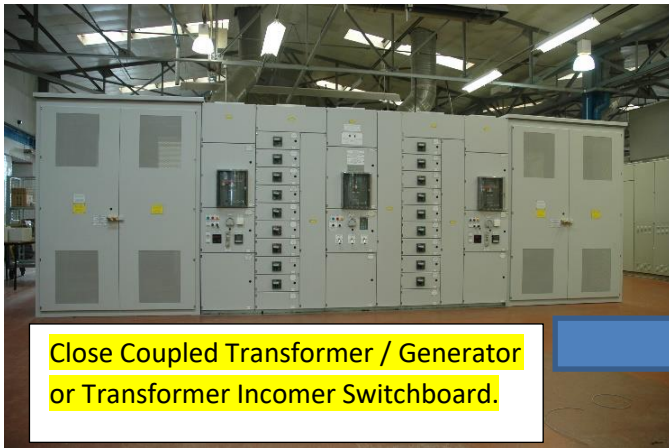
NCE IEC61641-1 / TR61641 COTS Switchgear ( 2016 New Marine build ) 4000A Compact Drawout Switchboard with Service Bay and Automation PMS interface in accordance with LRS Classification : ASTA Type Tested as 690Vac / 85kA / 4000A / Arc Type Tested to IEC/TR61641 Criteria 1 – 7 Tests under conditions of arcing due to internal fault with a short circuit current of 85kA at a rated operational voltage of 690V and a duration of short circuit of 300 ms applying criteria for an assembly providing personnel and assembly protection under arcing conditions. Assembly with Arc light detection and fast acting trip methodology.



**Arc Light Detection**

**Generator/Propulsion  
Swbd with Service  
Automation Bay & Synch  
Operator Interface**

**NCE New Build Arc Type Tested Solutions**



**Close Coupled Transformer / Generator or Transformer Incomer Switchboard.**



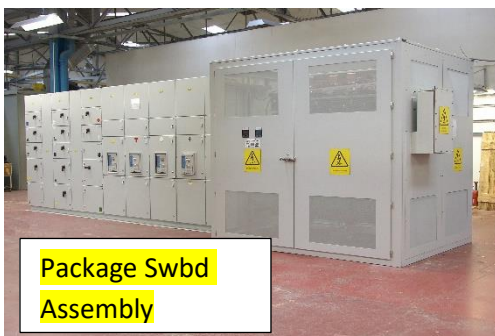
**Typical DNV Container**

Oil & Gas Bespoke Package Sub Switchboard ( Typical above ) with Inherent coupled Transformers, arranged as Free standing or ( Integrated into IEC12079, DNV 2.7-1, DNV 2.7.2, DNV 2.7.3, BS EN 60079 and ATEX Certified Container or Containers for new, and/or Temporary Retrofit Recycled Solutions in conjunction with NCE partners, and in compliance with SOLAS/IMO regulatory requirements for A60 fire protection as standard.

NCE Design engineers will develop a thorough understanding of the client technical requirements and offer our most cost competitive standard and/or “Bespoke” solution and would be pleased to apply both Safe area and hazardous area latest safety monitoring systems, purge and pressurization, fire and gas interfaces, instrumentation and control interface, along with alarm systems, lighting and small power, to plant wide PLC interface, offering a fully tested single lift solution ready for site erection, cable and services



**NCE Switchgear and Motor Control gear construction meets the full Seismic requirements for the UK Nuclear Industry as tested by Element Test Laboratory.**



**Package Swbd Assembly**



**NCE Drawout Pattern Motor Control Centres**