CMP PRODUCTS

As a market-leading specialist designer and manufacturer of cable glands, cable cleats and accessories, CMP has been providing safe and innovative solutions to the global market for over 60 years; gaining us an international reputation for quality and reliability.

Our products are developed to suit a wide range of customers' industrial applications across market sectors such as infrastructure, renewable energy, power transmission and distribution, rail, tunnels, marine, data centres, automation and robotics, water treatment, desalination, oil and gas, mining and general construction. They have been designed and rigorously tested to cover a variety of international codes, standards and approvals.

Our high-quality products are reinforced with exceptional customer service and innovative solutions; we offer on-hand technical support from our experts across the globe, from 10 different offices spread across 6 continents.

NEWCASTLE (Headquarters)
CMP Products Limited
United Kingdom
Tel: +44 (0) 191 2657411
E-Mail:
customerservices@cmp-products.com

HOUSTON (Texas Inc)
CMP Products Texas Inc
Texas, USA
Tel: +1 281 776 5201
E-Mail:
houstonoffice@cmp-products.com

PERTH, WA
CMP Products Pty Ltd
Australia
Tel: +61 8 9249 4508
E-Mail: perthoffice@cmp-products.com

BRISBANE, QLD
CMP Products Pty Ltd
Australia
Tel: +61 7 3801 0301
E-Mail: qldoffice@cmp-products.com

DUBAI
CMP Products Middle East FZCO
United Arab Emirates
Tel: +971 4 214 6114
E-Mail: meoffice@cmp-products.com

BUSAN
CMP Products (Korea) Ltd
South Korea
Tel: +82 51 780 5300
E-Mail: busanoffice@cmp-products.com

SINGAPORE
CMP Products (S.E.A) Pte Ltd.
Singapore
Tel: +65 6466 6180
E-Mail: seaoffice@cmp-products.com

SHANGHAI
CMP Products Division
P.R. China
Tel: +86 21 5837 9978
E-Mail: shanghaioffice@cmp-products.com

JOHANNESBURG
CMP Products
South Africa
Tel: +27 11 266 8880
E-Mail: africaoffice@cmp-products.com

MOSCOW
CMP Products
Russia
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EDMONTON, AB
CMP Products
Canada
Tel: +1 281 776 5201

E-Mail: houstonoffice@cmp-products.com

www.cmp-products.com

SECURING CABLES WORLDWIDE

CMP

NUCLEAR APPLICATIONS

GLOBAL

WHAT WE PROMISE
FOR YOUR BUSINESS

CMP Products is a leading designer, manufacturer, and supplier of cable glands, cable cleats and cable accessories for customers around the globe.

F4OR Fit For Offshore Renewables

65+ years experience

3 modern, cost effective, automated factories

Operational excellence & ISO-certified business management

Fast & flexible delivery

Innovative, quality products

Cable Cleats, Cable Glands & Accessories

Specialist installation & technical training experience

Global Distribution network

Exceptional Customer Service

Extensive Project experience & trusted supply chain partner with documented case studies

BRITISH ENGINES

We are a proud business unit of the British Engines group'

Reasons to choose CMP

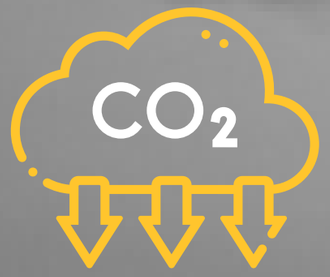
- **Product quality and reliability**
- **Global network of facilities throughout the world**
- **Recognised market leader with 65+ years' experience**
- **Multilingual installation training**
- **ISO-Certified QHSE Integrated Management System**
- **Significant worldwide project portfolio**
- **Specific Industry Sector Knowledge and Experience**

CONTENTS

NET ZERO TARGET

CMP is dedicated to driving environmental improvements in all areas of the business.

We are committed to halving greenhouse gas emissions by 2030, achieve net zero emissions before 2050, and disclose progress towards these commitments on an annual basis.



Target Emissions Reduction by 2030

50%

Target Net Zero by 2050

100%

PROUD PARTNERS

THE CLIMATE PLEDGE Paris... 10 years Early

SME Climate HUB

beama

BEGINNING ITS NET ZERO JOURNEY IN MAY 2021, THE COMPANY HAS COMMITTED TO THE UNITED NATIONS RACE TO ZERO CAMPAIGN ALONG WITH INDUSTRY LEADER BEAMA, AND SUPPORTS THE UK GOVERNMENT PROPERTY AGENCY (GPA) NET ZERO PROGRAMME. CMP PRODUCTS HAS GONE THE EXTRA MILE, AND ALSO BECAME A SIGNATORY OF THE CLIMATE CHANGE PLEDGE AND SME CLIMATE HUB. BY TAKING A STAND AND PIONEERING A GLOBAL INITIATIVE THAT WILL TAKE THE LEAD IN MAINSTREAMING CLIMATE ACTION, THE COMPANY IS BUILDING BUSINESS RESILIENCE ACROSS THE BOARD.

WHAT HAVE WE DONE SO FAR

- Our GHG Carbon Emissions baseline is FY 2019/20. We have already completed the GHG Carbon Emissions Reports for FY 2019/20 and FY 2020/21 including the scopes 1 and 2.
- A GHG Carbon Emissions Calculation Procedure has been developed and implemented at CMP Products.
- Carbon Emissions Champions have been trained.
- Senior Management at CMP have received Climate Reality Overview training.
- We are currently measuring FY 2021/22 which includes the scopes 1, 2 and 3 of the GHG Carbon Emissions.

OUR AMBITIONS

- ISO 50001:2018 Certification by August 2022
- Increase the use of renewable energy in all our sites worldwide
- Drive Net Zero Carbon Emissions within our supply chain
- Support global environmental initiatives
- Increase employees environmental engagement

MULTIPHYSICS
FEA SIMULATION

CMP Products has utilised FEA across hundreds of projects, helping engineers simulate their cable and cable cleat installations under the conditions faced in real-life scenarios.

This technology enables a better understanding of the forces acting on cables, cable management infrastructure and various cable cleat designs, the stresses and deformations observed and the subtle changes in cable cleat design or materials which can result in dramatic changes in performance.

The use of FEA reduces time, costs and ensures the safety of critical installations.

ABOUT FEA

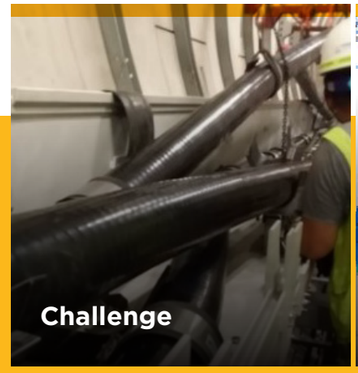
Finite Element Analysis or FEA is the simulation of a physical phenomenon using a numerical mathematic technique referred to as the Finite Element Method, or FEM. Simplified, FEA is a numerical method used for the prediction of how a part or assembly behaves under given conditions.

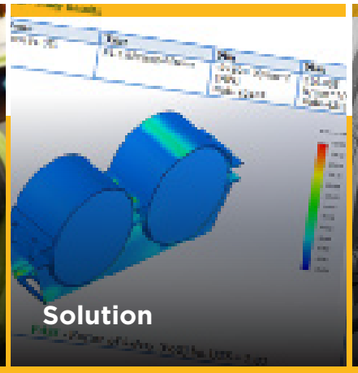
Engineers can use FEA to reduce the number of physical prototypes and run virtual experiments to optimise their designs.

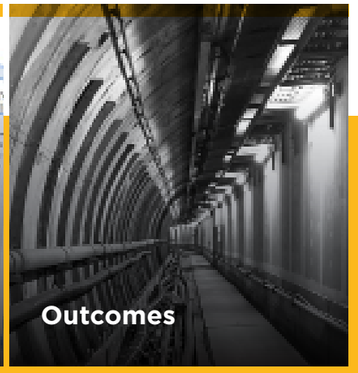
MULTIPHYSICS
FEA IN PRACTICE

At A Glance

A large capacity power transmission tunnel application for a major client in Singapore required a range of custom joint bay cable cleats to be used as anchor points in the transition of the cables; FEA was used to ensure each cable cleat could withstand the considerable forces imposed upon it at each transition point.







- Due to limited space in the tunnel, all cables had to be jointed at the top of the trefoil formation, with all three phases jointed within a 40m distance.
- Each cable in turn had to transition to the top of the formation to be jointed.
- The HV cables measured up to 190mm in diameter and were extremely rigid.
- Multiple different cable cleat arrangements were required as anchor points to allow the cable to be manipulated into position for jointing.

A large range of special ‘joint bay’ cable cleats were developed and FEA was used to ensure each cleat could withstand the considerable forces imposed upon it at each transition point.

Reduces costs

Multiple FEA studies were performed for each transition point and the results issued to the client, ensuring there would be no installation problems on site.

Quick Turnaround

11 months from design to delivery on-site, including installation trials.

Enhanced Safety

Through the use of FEA analysis, slight changes could be made to the product prior to prototypes and installation, ensuring the safest possible outcome.

Although there will often be a need for bespoke complex studies like the above, identifying requirements for custom product designs, CMP is bringing access to Multi-Physics FEA on our standard range of catalogue products through a basic, easy to use web based simulator program.

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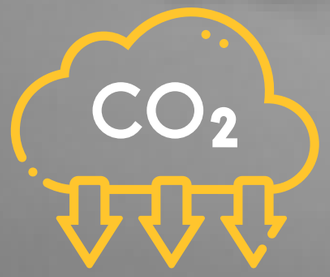

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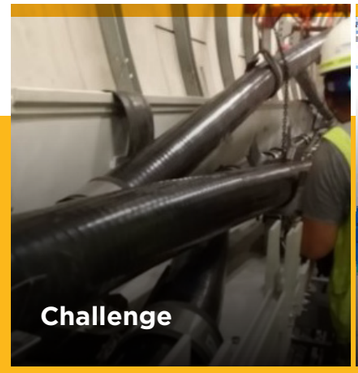

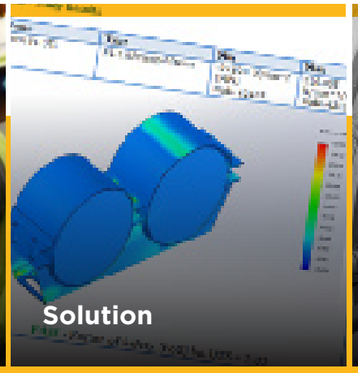

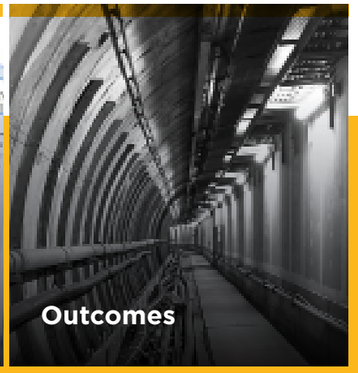

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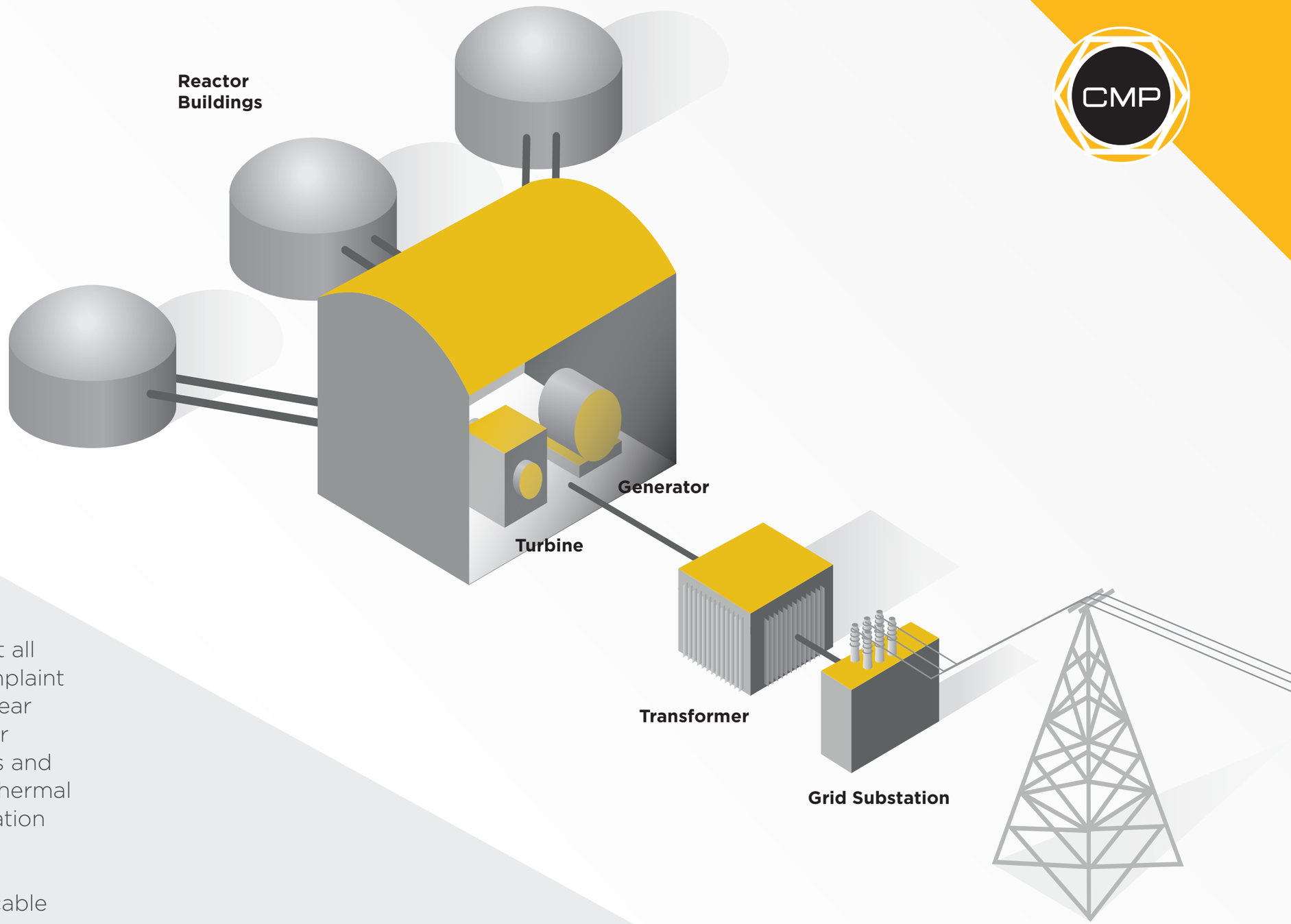
NUCLEAR APPLICATIONS

The reliability of equipment and components installed in power generation plants is essential to the successful operation of the process.



This is even more true for nuclear power plants, where it is critical that all elements/components are fully complaint with relevant standards for the nuclear industry including considerations for longevity, dust and moisture ingress and condensation, mechanical impact, thermal extremes, steam and pressure, vibration and shock.

Product and material selection for cable management solutions needs to take these factors into account, meet all of the project specifications alongside any local industry standards e.g. IEC 61914, IEC 62262, IEC 62444, IEC 62275.

PRODUCT SELECTION

The below information is used to illustrate the key areas for consideration when selecting cable management products. We have composed tables of product, like the typical example below, which can be found on subsequent pages in this brochure to help identify products recommended for different applications. The below explanations may help you to better correlate the available products with the duties of service and applications.

CABLE GLANDS

	Cable Type	Entry Thread Type	Entry Thread Length	Material	Features	Certification
 C2KGP	Armoured	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 DELUGE PROTECTION EMC +130°C -60°C	CE UKCA

It is important to be clear on what the cable specification is before proceeding in order to select the correct cable gland for each application.

Cable Type

Identify the type of cable being used on your installation, e.g. is it armoured (type of armour), unarmoured, screened or braided.

Entry Thread Type

The type of entry thread connection is important, so identifying whether the cable gland thread type needs to be tapered (NPT) or parallel (e.g. metric) for each items of equipment is critical to ensuring complete compatibility of the installations.

The cable gland needs to be selected to suit the size of the cable as well as the available entry size.

Entry Thread Length

Consider the thickness of the gland plate or enclosure cable entry that the cable glands will be installed into and if accessories will be used. Identify if the cable entry holes will be threaded or 'through type' clearance holes. The thickness of the enclosure, or hole depth (if a threaded entry) may determine that the cable gland thread length needs to be extended beyond the standard length.

When there is a risk of self-loosening due to excessive vibration a Serrated Washer should be considered and this may result in an extended cable gland thread length being required.

Material

The specific conditions of any installation will play a major part in the selection of the cable gland material, taking into account the level of environmental exposure along with the nature of the enclosure and cable armour material.

Features

Consider whether the cable gland needs a certain level of Ingress Protection, alongside the temperature of the environment it is being installed into.

Certification

Some applications may require certification, such as UKEX.

CABLE CLEATS

	Cable Formation	Cable Ø range take (mm)	Material	Fixing Hole	Features	Short Circuit Tested to IEC 61914
 VALIANT 1BCAL	Single	10 – 71mm in 12 sizes	Aluminium	1 x M10	• Operating temperature -60°C to 150°C • Sunlight (UV) & weather resistant • Can be double stacked • Excellent axial & lateral load retention	✓

It is important to understand the full cable specification and relevant data from the electrical system design study, including Short Circuit Currents before proceeding in order to select the correct type, size and quantity of cable cleats.

Cable Type

Are the cables single core, multicore or triplex?

Cable Formation

Identify formation the cables be installed in e.g. single, trefoil or quad.

Cable Ø Range Take (mm)

What size is the cable diameter you are working with?

Material

- 316 Stainless Steel is non-magnetic; it also exhibits higher creep resistance as well as excellent tensile strength and rupture resistance at high temperatures.
- 5000 series copper free aluminium is a good choice for its all-round performance characteristics including mechanical strength, durability, corrosion resistance and flame retardancy.
- Nylon is tough, high tensile, and resistant to abrasion and offers a cost effective performance for a lot of applications. This material is typically used for industrial applications where less harsh conditions exist.

Features

Consider the temperature rating of your application, whether there are weather factors to consider, if the cleat is being installed vertically or horizontally and if the cable cleats need to be stacked when installing.

Fixing Hole

Products can be supplied with one fixing bolt or two fixing bolt holes for the fixing of cable cleats to the mounting structure.

Short Circuit Tested

All cable cleats, regardless of the manufacturer, must be short circuit tested to IEC 61914 to ensure the safety of your equipment.

CASE STUDY

ITER RESEARCH PROJECT

ITER is the world's largest experimental nuclear fusion project. The reactor will mimic the sun's nuclear processes aiming to produce its first plasma in December 2025, potentially paving the way for fusion power of the future.

Technical support

Short circuit calculations

In-country Support

At a glance

CMP's dedicated cable cleat R&D team carried out short circuit calculations and analysis in support of the bid, which drew from a bank of several hundred physical short circuit current tests.

Challenge

A detailed guide was presented to the nuclear installation teams, advising spacing and fixing requirements, taking into account axial load calculations and optimising space utilisation.

Solution

Approximately 50,000 of CMP's SDSS Patriot trefoil and 2BC Falcon single cable cleats were installed across 94km distance of cables, which are capable of withstanding short circuits of 135kA (Patriot) and 110kA peak (Falcon).

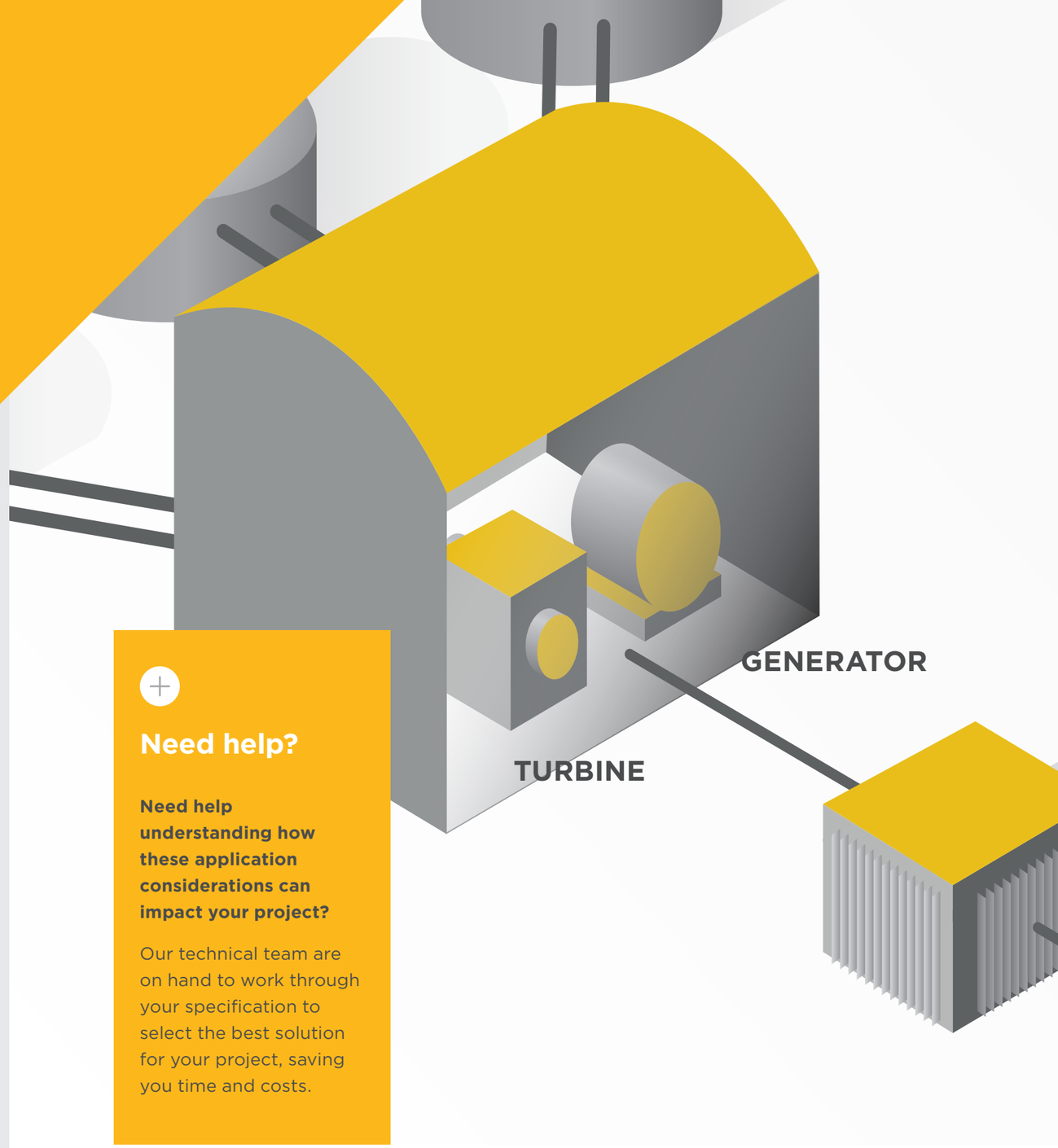
TURBINES, GENERATORS & AUXILLARIES

Housed next to the reactor sits various turbines, generators and auxillaries which process steam energy in order to generate electricity.

These are key components in any nuclear power plant and the cables and equipment associated must be terminated or restrained effecitvely to ensure the likes of steam and vapour do not impact upon performance, and cables are secured in the event of short circuit faults.

CABLE GLANDS

		Cable Type	Entry Thread Type	Entry Thread Length	Material	Features	Certification
	**CW/CWD SOLO LSF**	Steel & Aluminium Wire Armoured	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 EMC +130°C -60°C	CE UKCA
	**CX/CXD SOLO LSF**	Braid, Pliable Wire & Steel Tape Armoured	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 +130°C -60°C	CE UKCA
	**A2 SOLO LSF**	Unarmoured & Braided	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 EMC +130°C -60°C	CE UKCA
	**CIEL – With Cast Integral Earth Lug**	Steel & Aluminium Wire Armoured	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 EMC +130°C -60°C	CE UKCA
	**ZEN - Insulated Connection**	Unarmoured & Braided	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 EMC +130°C -60°C	CE UKCA



Need help?

Need help understanding how these application considerations can impact your project?

Our technical team are on hand to work through your specification to select the best solution for your project, saving you time and costs.

Key Application Considerations

- LOW SMOKE & FUME ZERO HALOGEN (LSF0H)
- INGRESS/HUMIDITY PROTECTION
- EMC
- THERMAL EFFECTS
- VIBRATION & SELF-LOOSENING
- RADIATION RESISTANCE
- STEAM & PRESSURE

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CABLE CLEATS

	Cable Formation	Cable Ø range take (mm)	Material	Fixing Hole	Features	Short Circuit Tested to IEC 61914
SINGLE/FLAT/PARALLEL						
 SAPPHIRE SHDSS	Single / Parallel	19 to 150mm in 13 sizes	316L Stainless Steel	2 x M10 or 1 x M12	• Short circuit rating of 135kA peak fault • Operating temperature -60°C to +60°C • Sunlight (UV) & weather resistant • Excellent axial & lateral load retention	✓
TREFOIL						
 SOVEREIGN HDSS	Trefoil	17 – 128mm in 24 sizes	316L Stainless Steel	2 x M10 or 1 x M12	• Short circuit rating of 190kA peak fault • Operating temperature -60°C to +60°C • Sunlight (UV) & weather resistant • Excellent axial & lateral load retention	✓

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SINGLE FORMATION						
 VALIANT 1BCAL	Single	10 – 71mm in 12 sizes	Aluminium	1 x M10	• Short circuit rating of 118kA peak fault • Operating temperature -60°C to 150°C • Sunlight (UV) & weather resistant • Can be double stacked • Excellent axial & lateral load retention	✓
 ZENITH 2BCAL	Single	38-151mm in 9 sizes	Aluminium	2 x M10 or 1 x M12	• Short circuit rating of 130kA peak fault • Operating temperature -60°C to 150°C • Sunlight (UV) & weather resistant • Can be double stacked • Excellent axial & lateral load retention	✓

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AVOIDANCE OF CABLE DAMAGE

LOW SMOKE & FUME ZERO HALOGEN (LSF0H)

CABLE SUPPORT IN VERTICAL APPLICATIONS

AXIAL LOAD REQUIREMENTS

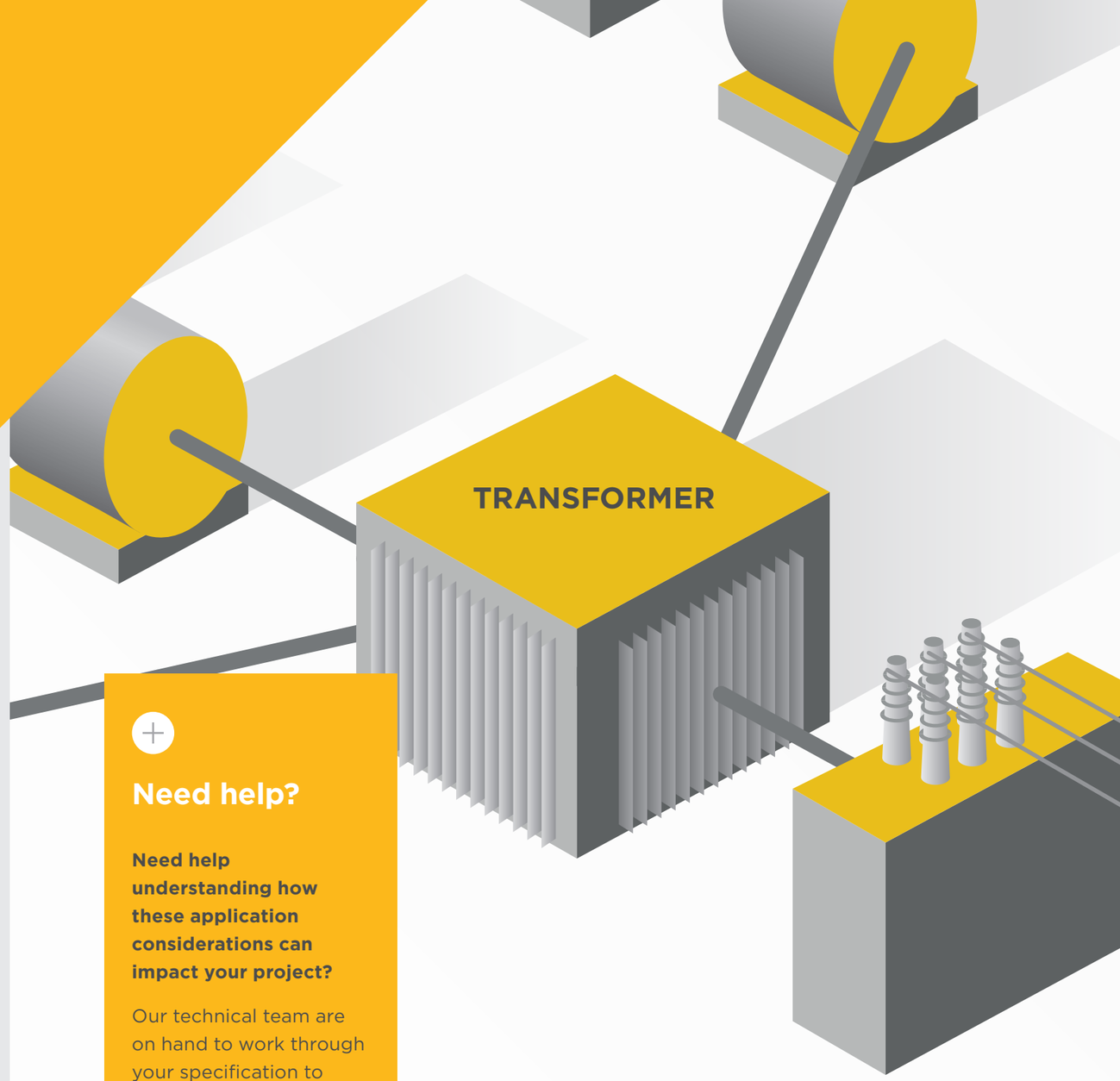
PRODUCTS LOAD TESTED TO SUIT APPLICATION

IMPACT RESISTANCE

TRANSFORMER

Transformers within a nuclear power plant are key in ensuring that the power being generated by the plant can be succesfully received to the grid.

Maintaining connections through good quality, reliable and effective cable management solutions is essential. This will ensure no costly downtime resulting from poor quality components, and ensuring protection of equipment and cables.



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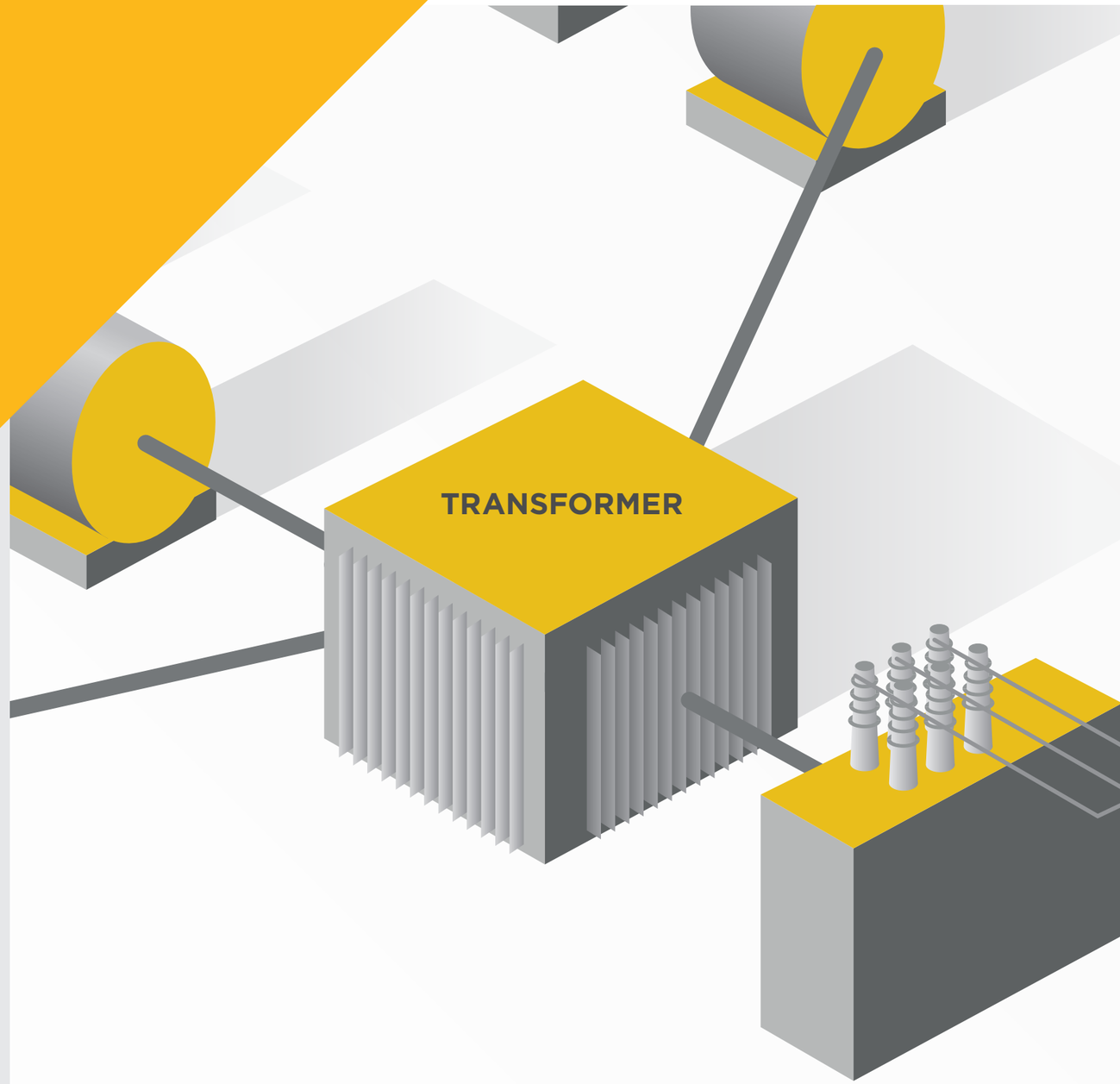
QUAD						
 SATURN QSDSS	Quad	16-71mm in 19 sizes	316L Stainless Steel	2 x M10 or 2 x M12	• Short circuit rating of 152kA peak fault • Operating temperature -60°C to +60°C • Excellent axial & lateral load retention	✓



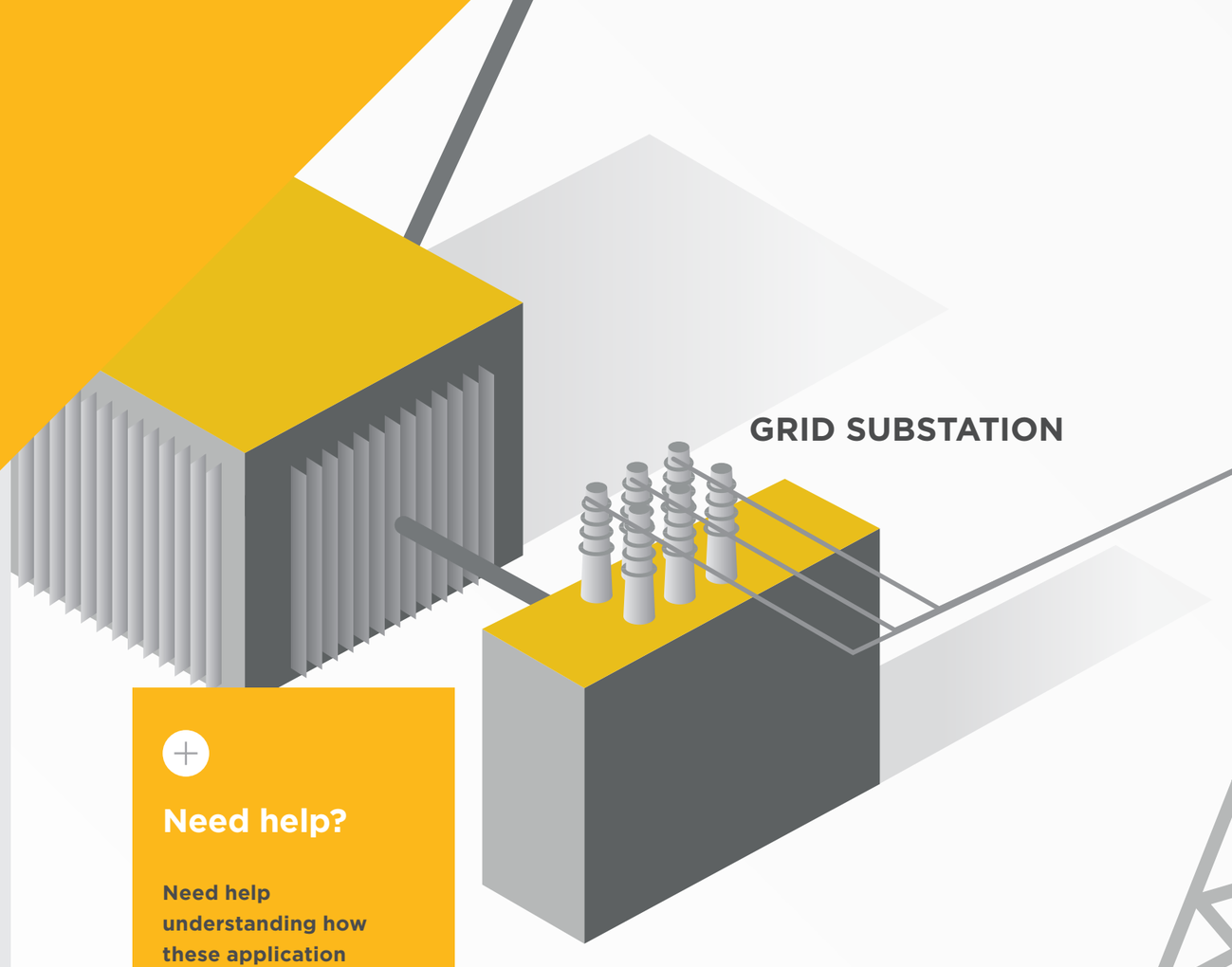
Key Application Considerations

- AVOIDANCE OF CABLE DAMAGE
- LOW SMOKE & FUME ZERO HALOGEN (LSF0H)
- CABLE SUPPORT IN VERTICAL APPLICATIONS
- AXIAL LOAD REQUIREMENTS
- PRODUCTS LOAD TESTED TO SUIT APPLICATION
- IMPACT RESISTANCE

GRID SUBSTATION

When power generated within a nuclear power plant reaches the grid substation, it is crucial to ensure a strong connection through equipment and cables is maintained.

Without this connection, the profitability of your nuclear project will be effected. The selection of cable mangement solutions that are strong, robust and reliable is essential in this process.



CABLE GLANDS

	Cable Type	Entry Thread Type	Entry Thread Length	Material	Features	Certification
 **CW/CWD SOLO LSF**	Steel & Aluminium Wire Armoured	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 EMC +130°C -60°C	CE UKCA
 **A2 SOLO LSF**	Unarmoured & Braided	Metric, NPT or other	10mm, 15mm, 20mm, 20>	Brass, Nickel Plated Brass, Aluminium, Stainless Steel	IP66 IP67 IP68 +130°C -60°C	CE UKCA

Need help?

Need help understanding how these application considerations can impact your project?

Our technical team are on hand to work through your specification to select the best solution for your project, saving you time and costs.

Key Application Considerations

- **LOW SMOKE & FUME ZERO HALOGEN (LSF0H)**
- **INGRESS/HUMIDITY PROTECTION**
- **EMC**
- **THERMAL EFFECTS**
- **VIBRATION & SELF-LOOSENING**

GRID SUBSTATION

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CABLE CLEATS

	Cable Formation	Cable Ø range take (mm)	Material	Fixing Hole	Features	Short Circuit Tested to IEC 61914
SINGLE FORMATION						
 VALIANT 1BCAL	Single	10 – 71mm in 12 sizes	Aluminium	1 x M10	• Short circuit rating of 118kA peak fault • Operating temperature -60°C to 150°C • Sunlight (UV) & weather resistant • Can be double stacked • Excellent axial & lateral load retention	✓
 ZENITH 2BCAL	Single	38-151mm in 9 sizes	Aluminium	2 x M10 or 1 x M12	• Short circuit rating of 130kA peak fault • Operating temperature -60°C to 150°C • Sunlight (UV) & weather resistant • Can be double stacked • Excellent axial & lateral load retention	✓

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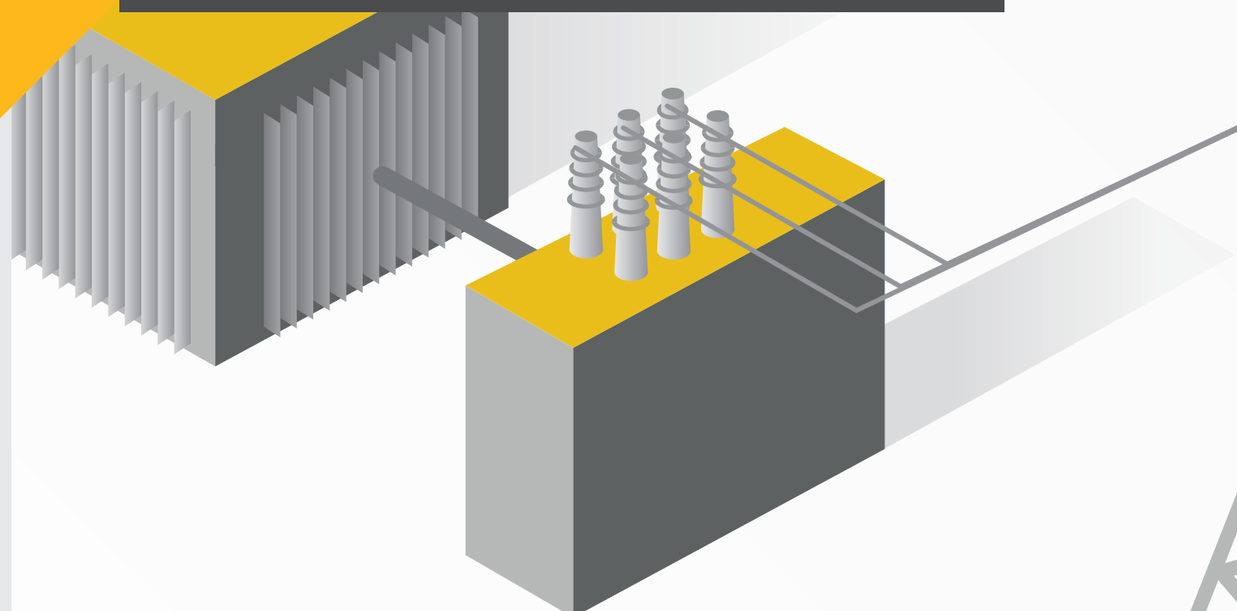

GRID SUBSTATION

Key Application Considerations

- AVOIDANCE OF CABLE DAMAGE
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CASE STUDY

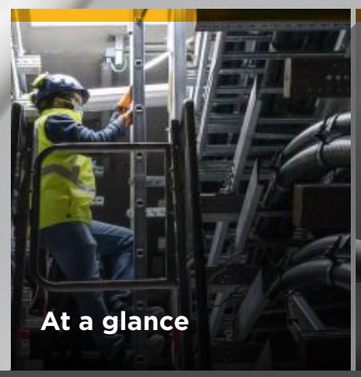
HINKLEY POINT C

Hinkley Point C in Somerset, England is the first in a new generation of EPR type nuclear power stations being built in Britain, contributing to the minimisation of carbon emissions and providing zero-carbon electricity for around six million homes.

Technical support

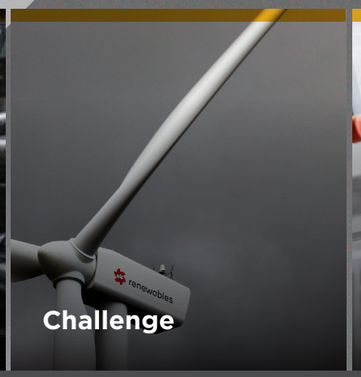
Short circuit calculations

Full product offering



At a glance

CMP Products was selected following a competitive tendering process, to supply the cable cleats and cable glands under a standardisation policy for the construction of the main plant.



Challenge

With a varied range of applications on the project, CMP worked closely with the Hinkley Point C teams to understand all technical requirements, specifying the most suitable product, alongside carrying out a range of short circuit calculations to assist.

Solution

CMP is now standardised on Hinkley Point C for supply of cable glands and cable cleats, covering high voltage cable cleat options alongside

BESPOKE SOLUTIONS

The energy landscape is regularly changing and adapting to become more efficient, greener and cost-saving.

Cable management solutions are required to adapt to suit these ever changing conditions, and at CMP we regularly carry out research to ensure we provide products to suit the demands of the marketplace.

If a product from our standard range does not meet project requirements, we will work with customers to engineer bespoke products based on their specific requirements. This can be due to varying factors including space and weight constraints to product ratings and extreme temperatures.

BESPOKE SOLUTIONS
HV & JOINTING BAYS

CMP engineered bespoke cable cleat solutions for Singapore Tunnel, a project designed to futureproof Singapore's electricity supply for the next 120 years.

The project required cable cleats to suit 230kV and 400kV cables, with diameters of up to 190mm.

Housed in cable ducts, cable cleats were required to restrain circuits of 230kV and 400kV cables. It was essential for the cleats to allow cables to thermally expand and contract during normal operation, as well as safely restrain the cables during short circuit conditions.

CMP was presented with a range of challenges which were taken into account when designing the bespoke products for example the cables had to be 'snaked' horizontally within cable ducts, allowing for thermal expansion and contraction, so the cleats had to work as a system with some being rigidly fixed and some allowed to slide as the cable moved.

Other challenges included cable spacing, cable weight, short circuit testing, and product life span and time constraints.

A trefoil 400kV solution was developed from 316L Stainless Steel , with a fibre reinforced plastic (FRP) low smoke & fume insert. This was followed by a similar trefoil design for the 230kV cable.

Single cable cleats and a large range of special 'joint bay' cleats were also developed to restrain the cables in the areas where they are 'transposed' and two lengths are joined together.

CMP carried out finite element analysis (FEA) to simulate short circuit testing, life time analysis and thermal analysis to identify how cables perform when installed (pictured below).

FIT FOR NUCLEAR

CMP Products is a granted status company for Fit for Nuclear (F4N). The F4N programme, which has been developed by the Nuclear AMRC, helps manufacturing companies measure their current operations against the standards required to supply the civil nuclear industry.

CMP achieved Fit for Nuclear (F4N) status in conjunction with the Nuclear AMRC following a string of business activities.

In order to achieve the F4N status, CMP engaged in a journey of business improvement, supported by the Nuclear AMRC. An in-house training programme was developed, specifically tailored around the nuclear industry, to encourage a 'nuclear safety culture'.

The status remains valid for three years, however CMP will be required to ensure it maintains and sustains its F4N status, through regular contact and site visits throughout each year.

F4N
Fit For Nuclear