

China Nuclear Presentation

Thursday 21st July 2022

Shuresh Maran
Business Development Director

Values & Responsibility



are the values guiding all of our work.

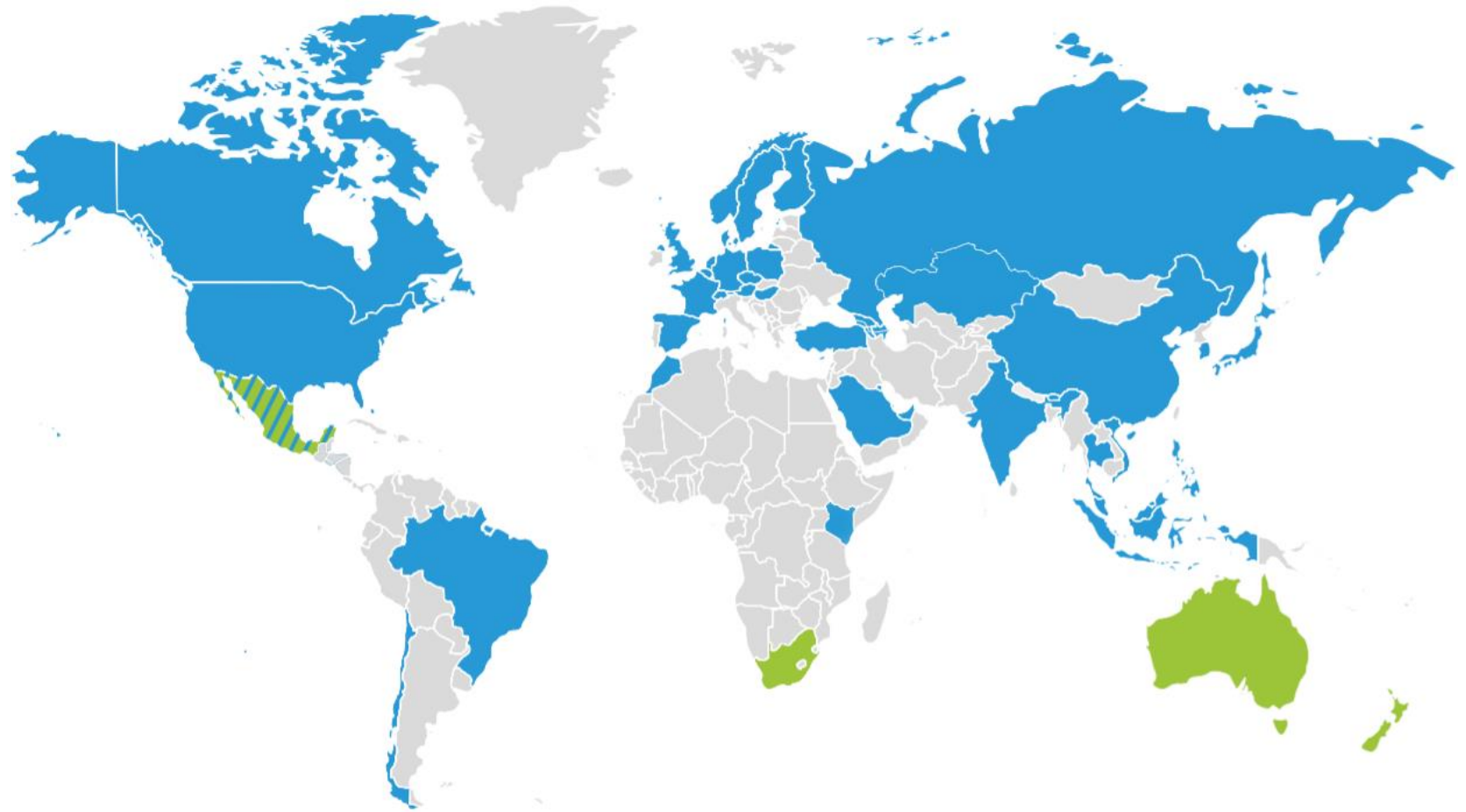


We enable people's wellbeing in demanding indoor environments



Halton's Global Presence

- Halton staff in 38 countries
- Own production in 9 countries, 13 factories
- Group HQ in Finland, regional HQ's in USA and Malaysia
- 10 R&D Centres, *Halton Innovation Hubs*, in 8 countries around the world.
- Licenced manufacturing in 4 countries



- Countries with Halton personnel
- Licenced manufacturing

Halton Marine

Ships

We are global first choice and market leader providing indoor wellbeing and ventilation safety for marine vessels.



Offshore Energy

We are technology leader providing safety and endurance for most demanding conditions in offshore energy production, platforms and substations.



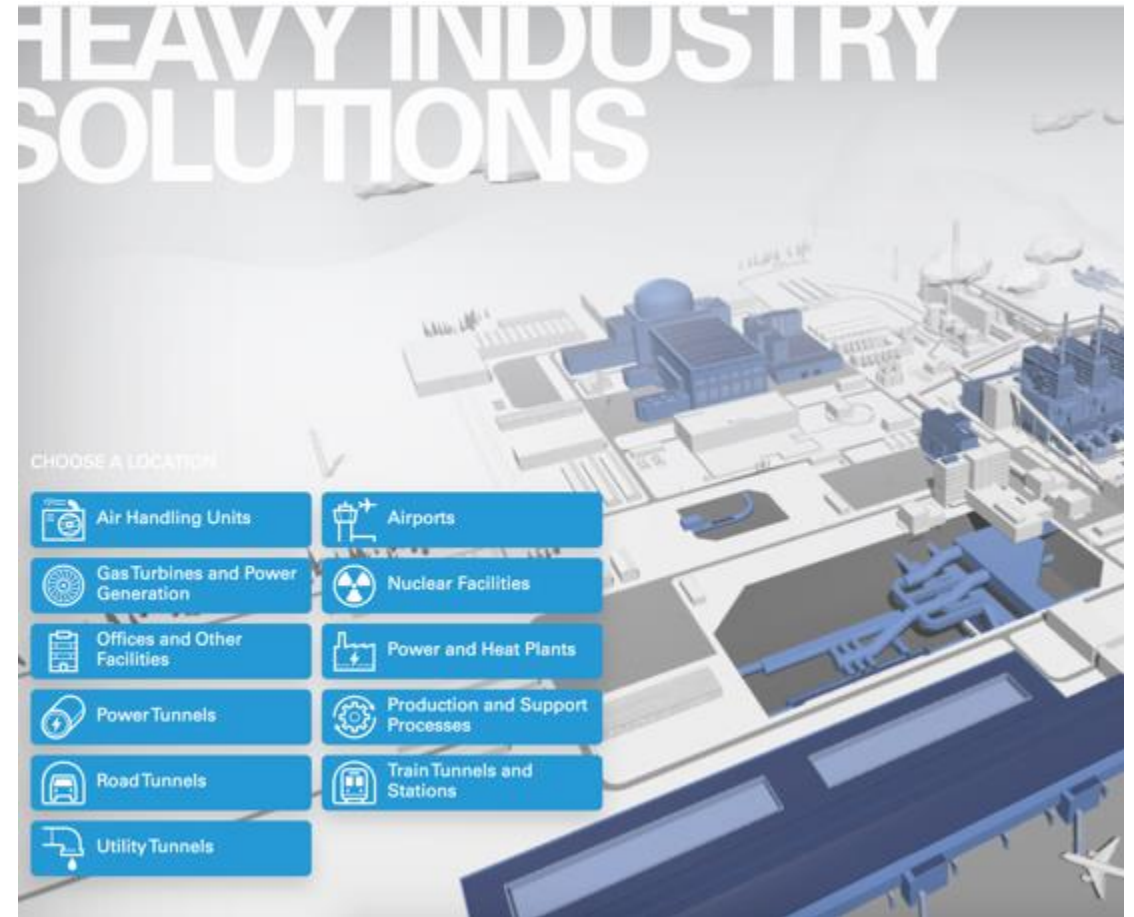
Heavy Industry

We are the most reliable partner for proving safety and enabling wellbeing in demanding environments in nuclear power plants, industrial applications and tunnels.



Halton Heavy Industry 3D World

- Great way to introduce Halton's offering in simple and informative way
- All product related information in one place: data sheets, animations, forms for contacting etc.
- <https://heavyindustrysolutions.halton.com/>



INDUSTRIAL & PETROCHEMICAL

APPLICATIONS: Petrochemical Plants, Refineries, LNG terminals, Oil & Gas Fields and Pipes, Manufacturing Plants, Laboratories

- **SCOPE:**
- Fire and gas dampers
- Gas retention dampers & Isolation dampers
- Non-return and pressure relief dampers
- Shut-off and balancing dampers
- Blast Protection Dampers
- Droplet separators, Outdoor louvres
- Diffusers, plenums, ventilation units

POWER GENERATION

APPLICATIONS: Gas Turbines, Diesel Generators, Power Plants, Wind Turbines

SCOPE:

- Fire and gas dampers
- Gas retention dampers
- Non-return and pressure relief dampers
- Shut-off and balancing dampers
- Droplet separators
- Outdoor louvres

NUCLEAR

APPLICATIONS: Nuclear Power Plants, Nuclear Waste Process Plants, Other Nuclear Related Projects

SCOPE:

- Fire and gas dampers
- Isolation dampers
- Non-return and pressure relief dampers
- Shut-off and balancing dampers
- Blast protection dampers

INFRASTRUCTURE & TUNNELS

APPLICATIONS: Metros & railways, Road tunnels, Data center cooling, Water Treatment & Sewage

SCOPE:

- Fire and gas dampers
- Smoke dampers
- Non-return and pressure relief dampers
- Shut-off and balancing dampers
- Blast protection dampers

Nuclear related projects (Flamgard)

Chernobyl Safe Containment Dome

- Status – Completed
- No of Dampers – 1,050
- Fabrication Man Hours – 19,243 hrs
- Fabrication Duration – 7 mths



Hinkley Point C Nuclear Power

- Nuclear island
- Conventional Island
 - Fire/Smoke Dampers
 - Isolation Dampers
 - Non Return Dampers
 - Control Dampers



Nuclear related projects (Flamgard)

UK Nuclear Sites

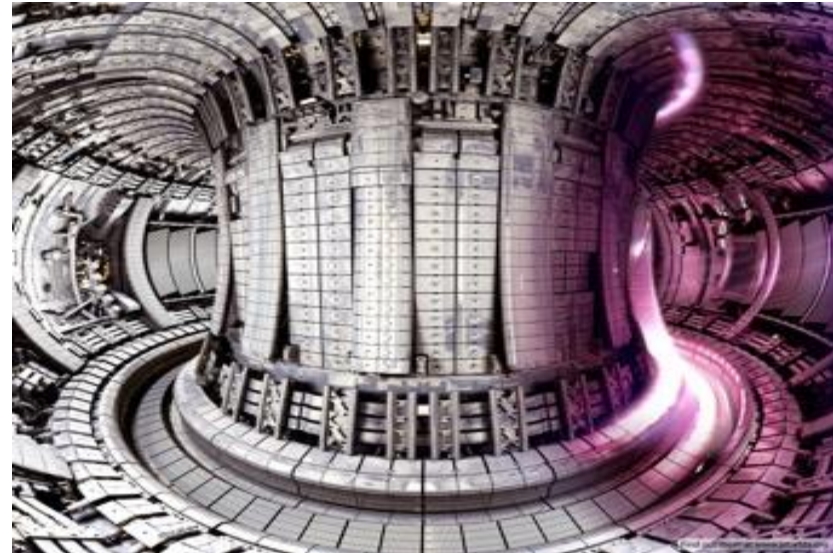
- Most UK Existing and decommissioned nuclear sites for nearly 40 years.

Sellafield Sites

- Status – On-going
- Multiple project stages
- *125 year decommissioning program*

UK Atomic Energy Authority

- Status – On-going
- Fusion Development Program
- Multiple Project Stages



Offering and solutions

CFD-01 Fire Damper

Multi Certified
Proven Track
record

- Latest addition to damper product family
 - ❑ CE-marked fire damper with fire ratings
 - ❑ E120S @ 300pa (uninsulated damper)
 - ❑ E120S@ 1500Pa (uninsulated damper)
 - ❑ Available in galvanized steel and 1.4404 stainless steel
 - ❑ EN1751 Class 3C leakage
 - ❑ Widest range of ATEX approved electric actuators in the market
 - ❑ 4 hours BS476 Pt 20, A0-A60, H0-H120
 - ❑ Large sized dampers available (over 3000x3000mm)
- Designed specifically heavy industry applications
 - Petrochem, Oil & Gas, Nuclear, Tunnel
- Various control configurations to meet E&I requirements.

Enabling Wellbeing



CFD-01 Nuclear Fire Damper



CFD-01 Off Shore Fire Damper

Nuclear Fire Damper

Special Control
philosophy

- Latest addition to damper product family
 - ❑ 10/30/60 year lifespan
 - ❑ Radiation Resistance 100 kGy
 - ❑ EI120S @ 300 pa (insulated damper)
 - ❑ EI120S @1500 pa (Insulated Damper under development)
 - ❑ 8G Seismic Resistance
 - ❑ EN1751 Class 3C leakage
 - ❑ 10,000 pa pressure resistance
 - ❑ -35 to 60 Deg Operating temperature
 - ❑ Salt Mist Resistance
- Designed for specialised Nuclear applications
 - Chernobyl Safe Containment
 - Hinkley Point C
 - Sellafield Sites



CFD-01 CB Fire Damper

Zero Leakage Damper

- For the most stringent condition, where absolute zero leakage is a requirement
- Zero leakage @ 10,000 pa
- Various possibilities depending on intended use:
 - ☐ Process & petrochem industries
 - ☐ Bio medical laboratory
 - ☐ Pharmaceutical manufacturing
 - ☐ Vacuum atmosphere manufacturing processes
 - ☐ Nuclear Island Containment areas
 - ☐ Oil & Gas process areas
- Available as ATEX certified

True Zero Leakage



CID-01 Zero Leakage damper

Non-return and pressure relief dampers

- Dampers to regulate the pressure or to prevent backflow in the ventilation ductwork system.
- Designed for high duct pressures and air velocities
- Heavy duty construction – 10kpa

Applications:

- Nuclear (Newbuild/De-Comm)
 - Oil & Gas + Petro Chem
 - Industrial HVAC systems
 - Tunnels & Infrastructure
 - Instrumentation rooms and other clean areas
 - Power Generation and Gensets
 - Wind Turbines & Substations
- Enabling Wellbeing



Flow control & shut-off dampers

- Dampers to shut-off and balance airflow rates in high pressure ductworks.
- Very low leakage rates → Fulfils class 3C requirements
- Heavy duty construction – 10kpa.

Applications

- Nuclear (New Build/ De-Comm)
- Oil & Gas, Petro Chem , Power Gen
- Industrial HVAC systems
- Cooling Systems (e.g. data centers)
- Power Generation and Gensets
- Wind Turbines & Substations



Blast Damper

1.1 Air Blast Tests

P_{Driver}	Test	P_{i1}	P_d	P_{a1}	P_{a2}	T_{close}
barg		barg	barg	barg	barg	msec
0.24	22	0.021	0.020	0.012	0.008	n/a^1
0.50	21	0.14	0.14	0.024	0.017	52
0.95	12	0.44	0.22	0.038	0.047	36
0.96	20	0.35	0.50	0.033	0.022	38



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- Not as common as e.g. fire protection matters
- To prevent blast pressure from entering into a building from air intake or outlet points
- Used in environments where explosion may occur and flammable substances are present in high volumes
- In industrial environments the pressure load varies, but usually remains under 1 bar
- Large range of blast applications from peak blast load to residual.
- Low pressure blast deflection without closing
- Can be installed vertically/horizontally on wall/roof and between ducts
- Mechanism is designed to be reliable and easy to operate

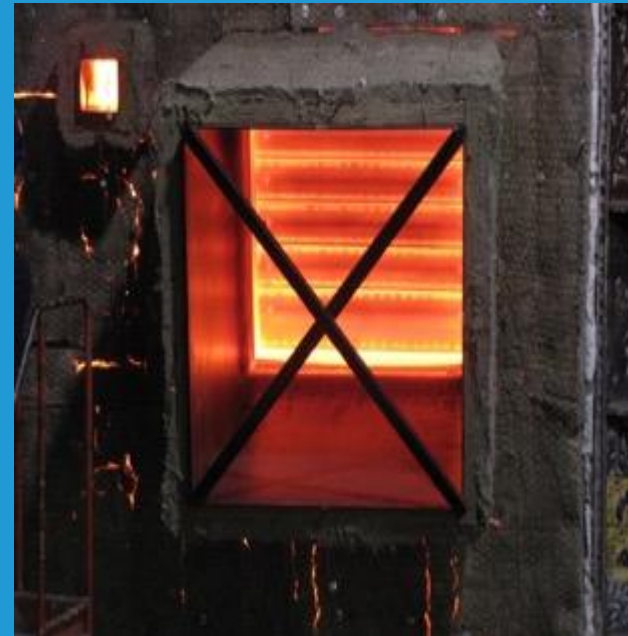


Halton

Testing Undertaken

- A0-A60, H0-H120 Fire Testing
- EN1366-2 Fire Dampers @ 300Pa & 1,500Pa
- EN1751 Pressure Drop and Leakage
- Blast testing 0.02 to 1.7 barg (Blast Dampers). Blast 0.4 barg (Fire Damper)
- 10kpa Pressure resistance
- 5- 8 G Seismic testing
- Salt Mist Resistance
- Seal lifespan validation

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