#### Qualifications
Qualification and test reports available according to IEEE 323, IEEE 344 and RCC-E, others on request.

KROHNE has capabilities for:
- Definition of qualification programmes
- Qualification and test reports
- Qualification management
- Surveillance of laboratories and tests

#### Mass flow measurement of main feed water
POWERSONIC series – high-performance ultrasonic flowmeters
- Ultrasonic transit time 7 or 11 paths, DN200...1,000, with flow processor and flow computer
- High accuracy up to ± 0.3% of measured value (mass flow)
- Representative average temperature of the fluid determined using the speed of sound on each path

#### Level measurement in spent fuel pool
POWERFLEX 2200 – two-wire loop powered HART® TDR (time-domain reflectometry) level transmitter
- Agrees with nuclear standards, conforms with IEC 61513 qualification reports acc. to IEEE 323, 344 and RCC-E
- High resistance to radiation (probe and cable), remote converter up to 400 m/1,312 ft away from probe, seismic qualification up to 300 m/s² / 984 ft/s²

#### Safety culture
KROHNE experience and applications in the nuclear industry on:
KROHNE Nuclear offers appropriate solutions for nuclear process applications around the world with the highest consideration for safety.

The definition of nuclear safety at KROHNE:
- Assuming responsibilities
- Adopting a self-critical attitude
- Adopting a rigorous and mindful approach
- Communicating clearly

Training modules are available on the KROHNE eLearning platform in English, German and French.

http://academy-online.krohne.com

#### Contacts
Global head office:
KROHNE Messtechnik GmbH
Ludwig-Krohne-Str. 5
47058 Duisburg
Germany
Tel.: +49 203 301 0
Fax: +49 203 301 103 89
info@krohne.com

France:
KROHNE S.A.S
2 Allée des Ors
BP 98
74103 ROMANS SUR ISERE Cedex
France
Tel.: +33 475 054 400
Fax: +33 475 050 048
info.france@krohne.com

China:
Chengde Rehe KROHNE Meters Co. Ltd.
Gao Xin Technology Development Zone
Chengde 067000
China
Tel.: +86 316 212 0910
Fax: +86 316 212 0912
info.china@krohne.com

CIS:
KROHNE Engineering LLC
Starovoziou housing estate
Volga region
Samar region
Russia
Tel.: +7 846 230 047 0
Fax: +7 846 230 031 3
samar@krohne.ru

KROHNE Nuclear – Your partner for the right measurement solution
With more than 40 years experience in the nuclear industry, KROHNE offers a complete instrumentation portfolio designed for safety-related and non-safety-related applications of flow, level, temperature and pressure measurement.

KROHNE Nuclear is a dedicated expert division for:
- Project management
- Design and calculations
- Testing and examination
- Product qualification
- Fabrication
- Documentation

with the highest consideration of safety.

#### Certifications
KROHNE is certified in the nuclear field:
- For design and manufacturing in accordance with nuclear standards (e.g. ASME Section III, KTA)
- By local nuclear authorities for design and manufacturing (e.g. by Russia, Romania)
- By local nuclear authorities for importing safety-related products (e.g. for China)
- By operators for supplying safety-related products (e.g. France, China, South Africa)
- By contractors for supplying safety-related products (e.g. France, Canada)

KROHNE Nuclear division offers appropriate solutions for nuclear process applications around the world with the highest consideration for safety.

Liquids:
- Acid and alkaline decontamination solutions, active concentrate, ammonia, anti-foaming agent, borated water, boric acid, condensate, condensed water, demineralised deaerated water, deuterium oxide, diesel, feed water, H2O2, NaOH, MgO, HNO3, NH4OH, H2N2O4, Na2CO3, NaOH, MnO4, H3BO3, HNO3, NH4OH, H2N2O4, KOH, heavy water, hydrazine, hydrogenated waste, iron sulfate, kerosene, lubricants, oil, primary coolant, radioactive waste liquid, reactor coolant, seawater, sewage water, spent resins, waste slurries, wastewater, water

Gases and steam:
- Air, argon, carbon dioxide, compressed air, helium, mixed gas with radioactivity, nitrogen, oxygen, steam water

www.krohne.com
### Electromagnetic flowmeters for conductive liquids (≥ 5 µS/cm)
- DN2.5...1,000
- Measuring accuracy: up to ± 0.2% of measured value + 2.5 mm/s
- Remote version up to 200 m/656 ft
- Analogue versions

### Variable area flowmeters for liquids, gases and steam
- DN8...100
- Measuring accuracy: up to 1.6% (VDI/VDE 3513-2)
- Local indicator or transmitter
- Metal or glass tubes

### Ultrasonic flowmeters for liquids, gases and steam
- DN25...4,000
- Measuring accuracy: up to ± 0.3% of measured value + 2 mm/s
- Remote version up to 30 m/98 ft

### Mass flow and density meters for fluids, gases and solids
- DN1...250
- Measuring accuracy: up to ± 0.1% of measured value + zero stability
- Remote version up to 20 m/66 ft

### Vortex flowmeters for liquids, gases and steam
- DN15...300
- Measuring accuracy: up to ± 0.75% for liquids (Re > 20,000)
- Remote version up to 50 m/164 ft
- Gross and net heat measurement

### Flow controllers for liquids, gases and steam
- Disc actuated
- DN15...200
- Measuring accuracy: up to ± 15% of switching point
- Sight glass
- DN15...50
- With or without flap

### Pressure transmitters
- Measuring range: from vacuum up to 1,000 bar/14,504 psi
- Gauge, absolute and differential pressure measurement
- Primary elements, flow computers and accessories

### Temperature assemblies and transmitters
- RTD or thermocouple devices
- Measuring range: -50...+1,600°C/-58...+2,912°F
- Head- or rail-mounted transmitters
- Analogue versions

### FMCW radar level transmitters
- Measuring range: up to 30 m/98 ft
- Measuring accuracy: ± 0.05% of measured distance, ± 5 mm/0.2” if measured distance < 10 m/33 ft
- Remote version up to 30 m/98 ft

### Magnetic bypass level transmitters
- Measuring range: 0.3...3.5 m/1...11 ft
- Measuring accuracy: ± 10 mm/0.4”
- Remote version up to 50 m/164 ft

### Displacer level transmitters
- Measuring range: 0.3...3.5 m/1...11 ft
- Measuring accuracy: ± 1.5% of full scale
- Local indicator or transmitter

### Level switches
- Electromagnetic or vibration devices
- Probe length OPTISWITCH 5X00: 80...6,000 mm/3.1...236.2
- Probe length LS 10: max. 2,000 mm/78.8”
- Hysteresis: approx. 2 mm/0.8”

### TDR guided radar level transmitters
- Measuring range: up to 40 m/131 ft
- Measuring accuracy: ± 0.1% of measured distance, ±10 mm/0.4” if measured distance > 10 m/33 ft
- Remote version up to 400 m/1,312 ft

### Displacement level transmitters
- Measuring range: 0.3...5.5 m/1...18 ft
- Measuring accuracy: ± 10 mm/0.4”
- Remote version up to 50 m/164 ft