Tracerco originated in 1958 as a radioisotopes research team within Imperial Chemical Industries (ICI) at Billingham on Teesside, UK, which is now the company’s headquarters. From these modest beginnings, Tracerco has continued to expand its product range and geographical presence, providing solutions to customer needs and responding to market opportunities.

Tracerco is part of Johnson Matthey’s Process Technology business, which has operations in over 30 countries and employs around 8,500 people.

Johnson Matthey is a FTSE 100 listed company formed in 1817.
Today, Tracerco has grown to be an industrial technology solutions business employing innovative technologies to measure, characterise and control process systems and diagnose operational problems in all aspects of the supply chain for oil and gas production, from reservoir management through refining and to retail outlets for consumer fuel products.

Tracerco today

Tracerco has 29 operational offices and employs around 300 people across the world, in key strategic locations. In addition, we have local service centres together with a worldwide network of agents and service partners. These bases allow Tracerco to deliver its products and services to our customers anywhere in the world, whilst still retaining the important aspect of local service.

Tracerco’s engineering experts are renowned for their professionalism, creativity and expertise in safely applying specialist solutions to a diverse range of seabed-to-surface challenges.

In 2003, Tracerco was awarded the prestigious Queen’s Award for Enterprise in the Innovation category for the development of its Profiler instrument. In 2005, the business received another Queen’s Award, this time in the International Trade category, for displaying outstanding export and growth in sales over three years. The company exports into all of the world’s oil, gas and petrochemical markets including Norway, Brazil, Nigeria, China, USA, the Caspian Region, Russia, Australia, the Middle East and throughout South East Asia.

In 2009, Tracerco was awarded its third Queen’s Award for Enterprise in Innovation for its range of radiation monitors.
Our achievements

- **1958**: Tracerco founded by ICI, Billingham UK
- **1957**: First scintillator based density gauge
- **1966**: First fixed level measurement instrument installed
- **1971–1998**: Tracerco’s 250kW Mark I Triga nuclear reactor operating at Billingham site
- **1985**: First subsea instruments installed at Highlander facility, UK North Sea
- **Mid-1980s**: Major expansion. Bases opened in Aberdeen, Houston, Sarnia, Edmonton and Kuala Lumpur
- **1996**: Hart instruments range launched
- **1999**: The TRACERCO Profiler™ was launched
- **2002**: Tracerco becomes part of Johnson Matthey Plc
- **2003**: Queen’s Award for Innovation (Profiler) 2005’s Queen’s Award for Enterprise (International Trade)
- **2009**: 300th Profiler series launched
- **2009**: TRACERCO™ Hyperion series launched
- **2009**: Queen’s Award for Innovation (Radiation Monitors)
- **1999**: The TRACERCO Profiler™ was launched
- **2009**: 300th Profiler series launched
- **2009**: TRACERCO™ Hyperion series launched
- **2009**: Queen’s Award for Innovation (Radiation Monitors)
The TRACERCO® Profiler™ was originally developed following a request from a customer in the UK North Sea. Its success, along with Tracerco’s principles of providing customers with a product that satisfies their requirements, has seen the Profiler developed into a customised range that is now used in applications ranging from the unique, harsh subsea environment to downstream refineries.

The Profiler is certified for use in Zone 1 areas with global certification from approval bodies including ATEX, FM and CSA. The SIL2 variation of the instrument provides a solution for use in Safety Critical Applications.

Each Profiler is tailored to suit the exact requirements of the customer. It measures the profile and density information in any vessel or pipe and since it requires no maintenance, our customers continue to reap the benefits on a daily basis.

Tracerco has installed over 300 Profilers worldwide since the first Profiler was commissioned in 1999.

The TRACERCO® Profiler™ is typically used in the following applications:
- Separators
- Desalters
- Slug Catchers
- Pulpipes
- FWKO Drums
- Suction Scrubbers
- FPSOs
- Coalescers
- Degassers
- Rich Amine Drums
- Alkylation Units
- Oil Sands
- Subsea
Benefits of The TRACERCO Profiler:

- Low energy gamma sources, resulting in no dose rates on vessel walls and the safest nucleonic instrument on the market.
- A continuous measurement range.
- Full phase density information and position – including (but not limited to) gases, foams, oils, emulsions, water, sands/solids, rag layers, froth and middlings.
- Full real time information in under 1 second.
- Low maintenance.
- Optimisation of chemical dosing, resulting in both financial and environmental benefits.
- Increased throughput – greater revenue generation.
- No wetted parts – equipment is retrievable without process break in.
- Secure remote connection using VPN technology.
- Sand jetting schedule is optimised.
- Unaffected by Naturally Occurring Radioactive Material (NORM) deposits within the process.

The TRACERCO Profiler typically comprises of a two or three dip pipe assembly, installed into a vessel through a single nozzle (3” or above). A narrow dip pipe holds a chain of low energy gamma sources, while the remaining dip pipes hold an array of gamma detectors. Typically each source is directed (using a collimating rod) onto two detectors above and below the plane of the source. This collimation reduces the number of low energy gamma sources used, stops radiation in all directions except that of the detector, and creates a continuous measurement range by directing each radiation beam up or down.

Tracerco provides a customised PLC panel with each Profiler. This panel, mounted in a safe area, provides limitless choices for connection to the client DCS, PCS or ESD. Options include analogue outputs, Modbus TCP/IP or RTU, Ethernet, Foundation Fieldbus and Profibus. Secure remote connections to each Profiler are available using VPN technology across the internet, allowing all Profiler information and diagnostics to be accessed from anywhere in the world.

Secure remote connection using VPN technology allows all Profiler information and diagnostics to be accessed from anywhere in the world.
The TRACERCO Profiler™ User Interface

Tracerco can provide a computer with each panel, that runs the TRACERCO Profiler™ Graphical User Interface software. The software now features tools which simplify calibration and provides updated real time graphics for ease of use and better understanding of the process conditions.

The PC connects directly to the Profiler PLC allowing all pertinent information to be visualised with no need to access the PLC logic directly.

The PC removes the need for what could be costly and complex integration of full Profiler data and functionality into your DCS/SCADA systems.

Full profile information is given in real time, showing every measurement point on the Profiler, with every density reading and associated phase. Complete datalogging of the profile information is implemented, with the length of logging only limited by computer storage space.
ConocoPhillips, Kuparuk, North Slope Alaska

The Kuparuk field is the second largest oilfield in North America. The First Stage Separator needed upgrading when ConocoPhillips brought on a new field with viscous oil and high solids content. The original separator used guided wave radar, displacers and differential pressure cells to provide the measurements.

The Profiler was chosen due to the extremes of temperature experienced, and the need for high reliability and maintenance free operation. ConocoPhillips was also interested in the Profiler due to its ability to see the difference between oil and water much more easily than other nucleonic instruments (a unique feature of the Profiler and the type of low energy gamma sources used).

“The Profiler was the only technology able to measure interface and level reliably and accurately. The Profiler has been extremely helpful in identifying emulsion build-up, allowing the operator to attack the issue quickly with chemicals.

The operator has also been able to improve the interface control tuning on the water outlet valves. Sand monitoring capability was an unexpected benefit. Operations suspected they would be able to see sand production, but results have exceeded expectations. The operator anticipated sand-jetting the vessel about once per week, but with the new viscous oil field producing more solids than expected, knowing when to sand jet has been a huge advantage.”

Instrument Tech, ConocoPhillips

Chevron, Kuito, Angola

The Kuito field lies with the Cabinda Province in Angola’s deep water Block 14. Oil is produced by an FPSO operated by Chevron.

Kuito oil forms emulsions quickly and calcium napthenate is produced at higher temperatures and solidifies if allowed to cool. The traditional instrumentation could not detect the emulsion and napthenate layers, resulting in the instrumentation becoming fouled and ceasing to function. Profilers were retrofitted to the separators, allowing all layers within the vessels to be identified. The Profilers enabled oil production uptime to be significantly increased, with dosing chemicals to be introduced in the correct quantities without incurring plant instability.

“The Profilers have proved to not only be totally reliable and trouble free but also a very important tool for managing the levels within the process. Because the Profilers clearly identify the emulsion phase within the vessels, we are quick to alert to any adverse shift in chemical dosage rates and are then able to do something about it in a proactive manner.

Prior to the installation of the Profilers, we would often find ourselves in an unstable or trip condition before we realised there was a problem with the chemicals. This is a huge advantage, being able to optimise chemical injection, i.e. not needlessly over-dosing expensive chemicals. There is absolutely no doubt that we have kept the plant running longer and have sustained fewer plant trips since the installation of this equipment.”

Production Superintendent, Kuito FPSO
The benefits of the proven TRACERCO Profiler™ technology have now been taken subsea to provide the ultimate marriage between performance, reliability and the environment.

**The TRACERCO Profiler™ – unlocking subsea potential**

The future of oil recovery lies in accessing increasingly complicated reserves. In many applications seabed processing holds the key. This presents many challenges including providing robust and reliable real time information about key process parameters. Tracerco has been involved in the revolutionary application of its award winning Profiler technology for use in the first commercial seabed processing plant.

Seabed processing

In the Tordis SSBI system delivered to Statoil by FMC Technologies, Tracerco has provided six subsea Profiler instruments which give indispensable operational information for measurement and control of separators. Used to enable reliable two phase separation as well as sand measurement, the Profiler technology employed is already capable of providing for the future needs of subsea separation. Each Profiler supports the configuration of up to 6 specific phase classifications which typically include sand, water, emulsion, water and foaming measurements. The subsea Profilers are qualified to ISO13628 and manufactured to exacting NORSOK standards.

**Statoil Heidrun – Norwegian Sector, North Sea**

“Compared to other level instrumentation, this must be state of the art.”

Operation and Maintenance Supervisor, Heidrun

“Compared to other items, they have continued to work uninterrupted. I would say, from my personal experience here, these are and by far the best interface measuring devices I have encountered in my more than twenty years experience.

The Tracerco personnel sent to site to carry out installation and commissioning were excellent, technically very competent and professional”

**TECK-Skottsøy – Norwegian Sector, North Sea**

“In many cases the commissioning process has led to the end user learning more than expected about his process. We have found Tracerco to be an able and conscientious partner, and have no hesitation in recommending Tracerco’s nucleonic instrumentation.”

**BP Schiehallion, UK Sector, North Sea**

“It is very accurate, and tells you exactly where the oil/water and emulsion is, and even the foam and sand. With the help of the Profiler, we reached maximum capacity of our separator and saved a lot in chemical treating”

Peter Lc, KMCP Field Manager, China

“We are quickly alerted to any adverse shift in the level and are then able to do something about it in a proactive manner”

Louis Zhao, Project Engineering Supervisor, ConocoPhllips China Inc.

**Saqrara Project – Gulf of Suez, Egypt**

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Louis Zhao, Project Engineering Supervisor, ConocoPhilips China Inc.

**BP Schiehallion, UK Sector, North Sea**

“In its current mode we use the Profiler to control the produced water interface level, which in the past has been a difficult level to detect and control but with the installation of the Profiler there is greater confidence among the offshore control room technicians concerning accuracy of the instrumentation display. Another benefit has been that the quality, oil in water ppm, of the produced water leaving the separator has seen a significant improvement.

The steady and reliable interface level control produced by the Profiler has been the major contributor”

Process Engineering Technical Authority, Schiehallion Field
<table>
<thead>
<tr>
<th>Model</th>
<th>Standard/Topsides</th>
<th>Subsea</th>
</tr>
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<tbody>
<tr>
<td><strong>Performance</strong></td>
<td><strong>Electrical</strong></td>
<td><strong>Mechanical</strong></td>
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<tr>
<td>Accuracy</td>
<td>SIL2</td>
<td>3&quot; or greater</td>
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<tr>
<td>Density Range</td>
<td>Ex e IIB T4</td>
<td>Titanium</td>
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<tr>
<td>Number of Measurement Points</td>
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<td>ASME VIII, PD5500</td>
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<td>Update Interval</td>
<td>-50°C to + 200°C</td>
<td>Custom</td>
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<tr>
<td><strong>Density Range</strong></td>
<td><strong>Safety Integrity</strong></td>
<td><strong>Design Codes</strong></td>
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<tr>
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<td>Not Applicable</td>
<td>Custom</td>
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<tr>
<td><strong>Number of Measurement Points</strong></td>
<td><strong>Safety Code</strong></td>
<td><strong>Operating Pressures</strong></td>
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<tr>
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<td>Not Applicable</td>
<td>Custom up to 3000m depth</td>
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<td><strong>Approvals</strong></td>
<td><strong>Miscellaneous</strong></td>
</tr>
<tr>
<td><strong>Update Interval</strong></td>
<td>To IEC13628</td>
<td>Low headroom option</td>
</tr>
<tr>
<td>1 second</td>
<td>-20°C to + 125°C</td>
<td>Custom – designed to Manway fitting and other methods available</td>
</tr>
</tbody>
</table>

**Notes:**
- Each Profiler is custom designed to suit the vessel, range requirements and control system integration requirements.
- Profilers can be used in low headroom areas. Please contact Tracerco to discuss your needs.
- Low and high temperatures may result in a modified design.
Installations List

ADCO/Technip, Bab Field, Abu Dhabi
Agip KCO, Kashagan Field Development, Kazakhstan
Albian Sands, Alberta Oil Sands, Canada
BHP Billiton, Ningaloo Vision FPSO, Australia
BHP Billiton, Pyrenees, Australia
BHP Billiton, Stybarrow, Australia
BP, Alaska GC-2, North Slope, Alaska
BP, Cherry Point Refinery, USA
BP, CHOPS, Alaska
BP, Clair Platform, UK
BP, Forties Delta Platform, UK
BP, Greater Plutonio FPSO, Angola
BP, Harding Platform, UK
BP, Miten Point, Alaska
BP, Saqara Field Project, Egypt
BP, Schehallion FPSO, UK
BP, Skarv FPSO, Norway
BP, Texas City, USA
BP, Whiting, USA
BP, Valtai Platform, Norway
Carm Energy, Malanga Process Terminal, India
Chevron, Alba Northern Platform, UK
Chevron, Benguela Belize CPT, Angola
Chevron, Blind Faith, Gulf of Mexico
Chevron, Frade, Brazil
Chevron/SBM, Kuto FPSO, Angola
Chevron, Tahiti, Gulf of Mexico
Chevron, Toba Landana, Angola
Chevron, BEWA/BECW, Benchamas, Thailand
CNRL, Banob, Ivory Coast
CNRL, Horizon Oil Sands Project, Canada
CNRL, Nisen Southern Platform, UK
Conoco Belian FPSO, Indonesia
ConocoPhillips, Bohai Bay CFD FPSO, China
ConocoPhillips, Bohai Bay Phase II, China
ConocoPhillips, Bratviken, Norway
ConocoPhillips, Kupruuk, Alaska
ConocoPhillips, North Belut, Indonesia
ConocoPhillips, Peng-Lai-2, China
ConocoPhillips, Talas Project, USA
CNODC, Nan Boa FPSO, China
ENI, Nikaitchu, Alaska
ExxonMobil, Hibernia Platform, Canada
ExxonMobil, Ringhome Platform, Norway
Fluor/CNRL, Horizon Oil Sands Project, Canada
KBRI, Tombua Landana, Angola
Kerr McGee, Leadon GPIII FPSO, UK
Kerr McGee/CNOC, Bohai Bay CFD FPSO, China
KIO (KOC/Saudi Aramco), Al-Khafji, Saudi Arabia
Maersk Oil, AD Platform, Qatar
Maersk Oil, GP3 FPSO, UK
Maersk Oil, Janice, UK
Maersk Oil, Peregrino FPSO, Brazil
Marathon Oil, Alveheim, Norway
Murphy Oil, Kilieh FPSO, Malaysia
Pemex, Chac A Platform, Gulf of Mexico
Petrobras, Cespes, Brazil
Petrobras, P26 FPSO, Brazil
Petrobras, P53 FPSO, Brazil
Petrobras, P37, Brazil
PetroCanada, TerraNova FPSO Project, Canada
PetroCanada/Amerada Hess, Tinton FPSO, UK
Petronas, Angsi Platform, Malaysia
Petronas, Suramadu Phase II, Malaysia
PDO, Qarn Alam, Oman
PGS/BR, Foraenaf FPSO, UK
Rasgas, Qatar
Sakhalin Energy/Shell, LUN-A, Sakhalin Island, Russia
Sakhalin Energy/Shell, PA-B, Sakhalin Island, Russia
Shell, Espirito Santo, Brazil
Shell, PDQ, Tank Terminal, Oman
Shell, Tern Alpha Platform, UK
Statoil, Tordis SSB1 Subsea Module
Statoil, Grane Platform, Norway
Statoil, Gulflaks C Platform, Norway
Statoil, Hammerfest LNG, Norway
Statoil, Hadrud Platform, Norway
Statoil, Norme FPSO, Norway
Statoil, Ormen Lange, Norway
Statoil, Oseberg Platform, Norway
Statoil, Sørme TLP, Norway
Statoil, Statfjord B Platform, Norway
Statoil, Troll C Platform, Norway
Syncrude, Alberta Oil Sands, Canada
Talisman/Bluewater, Bice Holm FPSO, UK
TengizChevron, Kazakhstan
Total, Dalis FPSO, Angola
Total, Moho Bilondo FPSO Project, Republic of Congo
Total, Pazflor Subsea, Angola
Woodside Petroleum, Angel Platform, Australia
Woodside Petroleum, Enfield FPSO, Australia
Woodside Petroleum, Pluto LNG, Australia
Tracerco offer Service Agreements to all our clients.

As the only nuclideic instrumentation supplier to be able to offer a full range of support services (Radiation Protection Advisory services and Process Diagnostics), we can ensure your products and processes are correctly monitored, maintained, remain compliant and are recycled correctly at the end of their working life.

Please contact Tracerco for further details on these programmes, or ask for a proposal with your system.

Framework agreements can include:

- Compliance checks
  - Leak test certification
  - System health checks
  - Radiological critical examinations
  - Source integrity assessment
  - Trip checks

- Optimisation checks
  - Re-calibration
  - Performance assessment
  - Validation of measurement

- Field Services
  - Pre-commissioning checks and inspection
  - Repair, refurbish and relocation
  - Remove, recycle and replace

- Upgrades
  - Advice on the best way to upgrade based on your needs
  - Upgrading firmware, software, hardware
**Training Courses**

TRACERCO™ Instruments Training is a comprehensive two day training course tailored to provide delegates with essential knowledge and understanding to operate and maintain your complete range of TRACERCO™ level, density and interface nucleonic measurement systems along with The TRACERCO™ Profiler.

The course programme includes operational safety and maintenance, equipment calibration and the underlying principles of radioisotope technology. A significant proportion of the course is given up to practical work including "hands on" fault finding and resolution exercises.

Each course can be tailored to the instruments installed onsite, with emphases on your area of interest. Onsite worldwide training can be provided, as well as regular training sessions held at Tracerco’s UK sites in Aberdeen and Billingham.

- Radiation awareness, hazards and source container safety
- Nucleonic instruments theory
- Level/trip and auxiliary equipment practical course
- Density/trip and auxiliary equipment practical course
- Software configuration, instrument calibration and fault finding diagnostics exercises
- Practical fault-finding using Tracerco training equipment

Each course can be tailored to the instruments installed onsite, with emphases on your area of interest.
In recent years, legislation in this area has become increasingly complex, placing greater demands on operator’s time and resources to safeguard and to demonstrate legislative compliance. Against this background, operators are increasingly looking to their Radiation Protection Advisors to provide and manage a range of support services which can directly impact both Radiation Protection standards and Environmental Stewardship. In recognising this trend, Tracerco has developed an integrated approach to Radiation Protection, ensuring that the customer can access appropriate technical support services, as and when required, both efficiently and effectively.

Tracerco has over 20 years experience in the provision of Radiation Safety Advice.

The key elements of this Integrated Approach are –

1. Provision of Radiation Protection Advice
2. Training
3. Radiation Protection – formal investigations including dose assessment following accidents or incidents
4. Waste Management
5. Radiochemical Analysis
6. Source Leakage Testing
7. Radiation Monitor Design, Manufacture, Calibration and Repair

Please contact Tracerco for further details on these programmes.