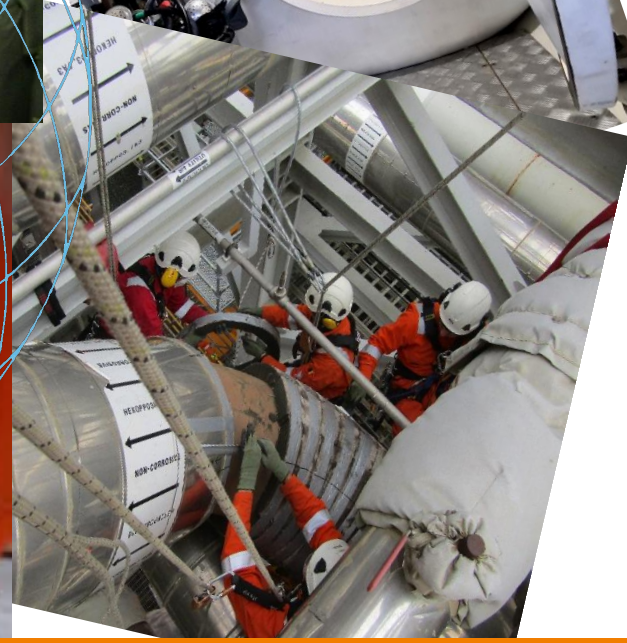
ENGINEERING AND CONSULTING CENTER

TECHINCOME



INSPECTION PROGRAMS AND ADVANCED NON-DESTRUCTIVE TESTING TECHNOLOGIES

ТЕХ ИНКОМ


СЕВЕРНЫЙ ЛЕДОВИТЫЙ ОКЕАН
ARCTIC OCEAN
РОССИЙСКАЯ ФЕДЕРАЦИЯ
RUSSIAN FEDERATION
САХАЛИНСКАЯ ОБЛАСТЬ
SAKHALIN REGION
International Date Line
ТИХИЙ ОКЕАН
PACIFIC OCEAN
ИНДИЙСКИЙ ОКЕАН
INDIAN OCEAN
ТИХИЙ ОКЕАН
PACIFIC OCEAN
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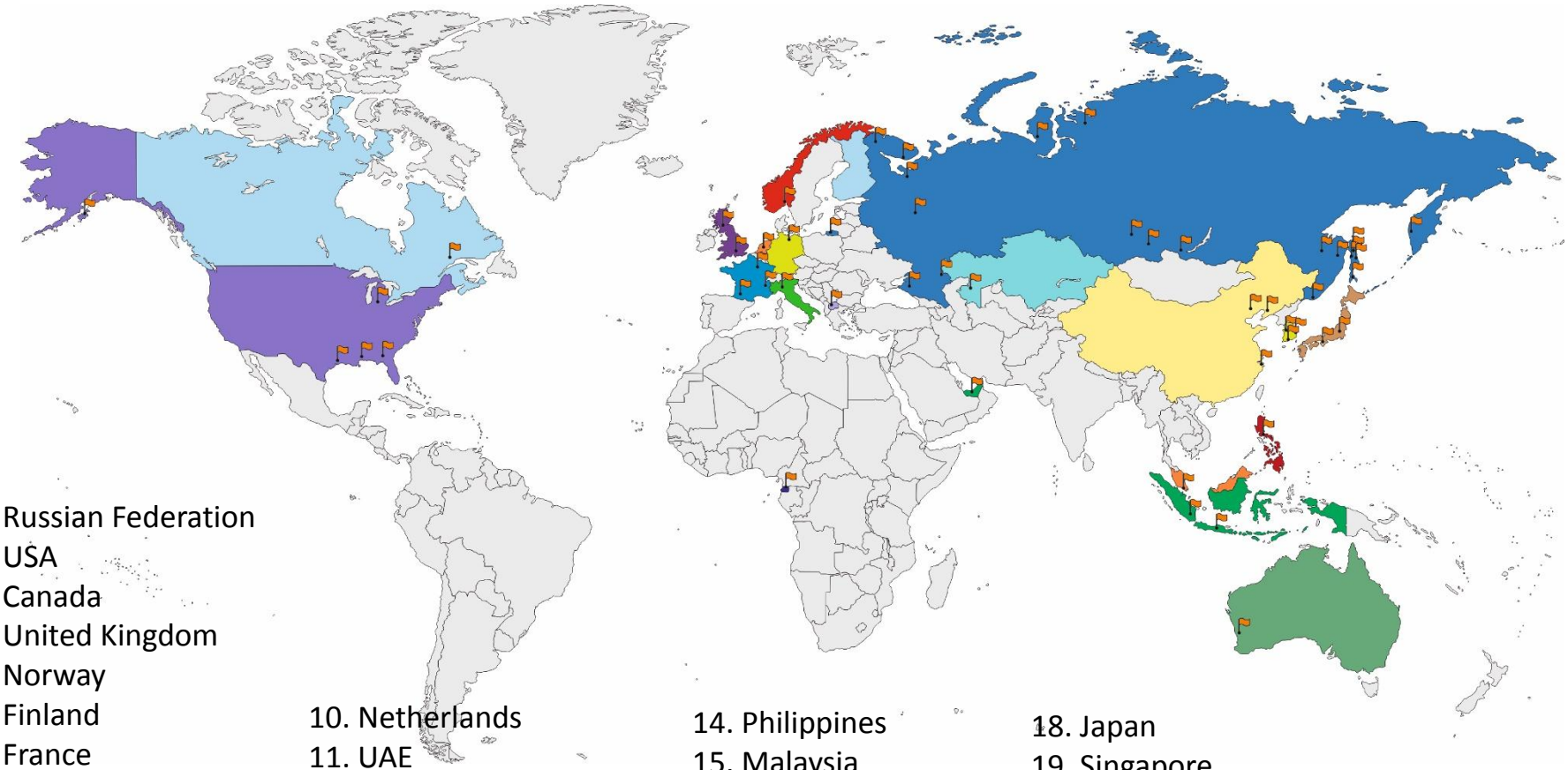
ТЕХ ИНКОМ

PROJECTS AND CONTRIES



1. Russian Federation
2. USA
3. Canada
4. United Kingdom
5. Norway
6. Finland
7. France
8. Germany
9. Italy
10. Netherlands
11. UAE
12. Australia
13. Indonesia
14. Philippines
15. Malaysia
16. China
17. South Korea
18. Japan
19. Singapore
20. Kazakhstan
21. Equatorial Guinea

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PARTNERS / CLIENTS

WORKING 30 YEARS FOR RESULT AND QUALITY

Since 1992, **"TECHINCOME"** has been providing industrial safety inspection and engineering services and works. It has been providing the services of technical supervision, construction control, third party inspection, quality management, quality assurance and control (QA/QC) at all stages of construction projects implementation. It provides control and supervision engineering services to confirm compliance of the design, production preparation, manufacturing, construction, installation, commissioning, operation of hazardous production facilities (HPF) with the mandatory requirements.

TECHINCOME has been providing production control services during the HPF operation: examination, technical diagnostics, expert evaluation, technical audit, development of technical and operation documentation, engineering, certification of technical devices and equipment, welding, and personnel.

Since 2007, TECHINCOME has been providing HPF industrial equipment integrity control services per Risk Based Inspection (RBI) programs using advanced NDT methods.

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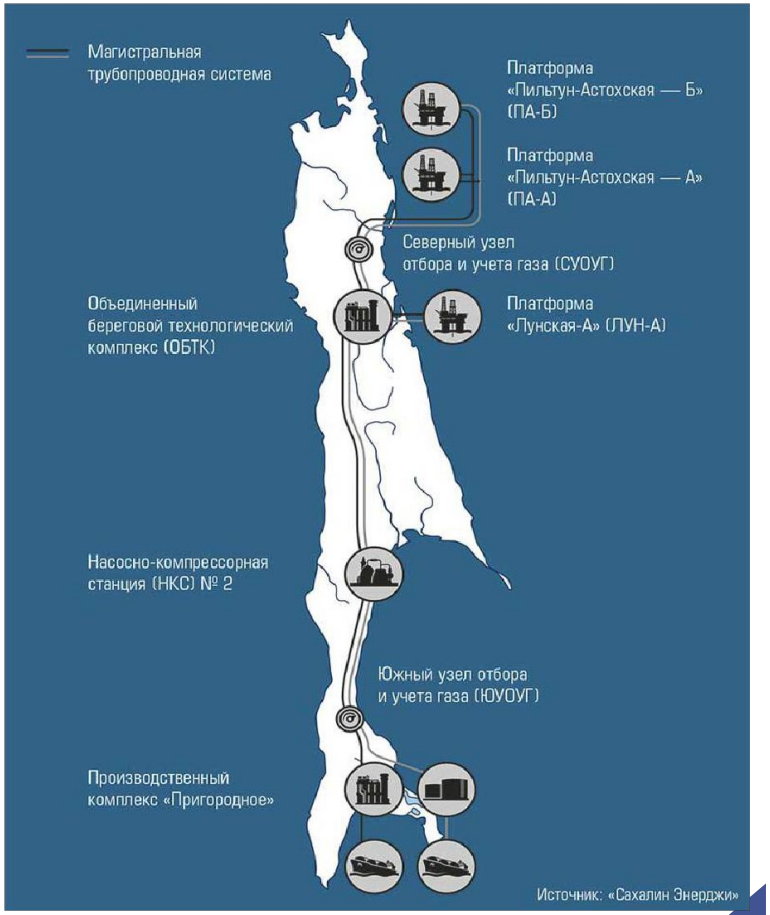
WORKING IN PROJECTS FOR MORE THAN 25 YEARS



ТЕХИНКОМ

TECHNICAL SUPERVISION, CONSTRUCTION CONTROL, THIRD PARTY INSPECTIONS, AUDITS, EXPERT EVALUATION, QUALITY MANAGEMENT, QUALITY ASSURANCE AND CONTROL (QA/QC), INTEGRITY CONTROL PER RISK BASED INSPECTION (RBI) PROGRAMS

SAKHALIN-2 LNG Plant Construction and Start-up

Yamal LNG (Engineering) PSTS London, Paris

Yamal LNG airport Sabetta, Yamal peninsula

Yamal LNG modules fabrication China, Indonesia

Modules delivery, installation, commissioning Yamal LNG, Sabetta

SAKHALIN-1 Yastreb Drilling Rig

SAKHALIN-1 Chayvo field Development Temporary Preparation Facility (TPF)

SAKHALIN-2 Onshore main pipeline

SAKHALIN-1 OPF Chayvo Block Process Modules (Daewoo, South Korea)

Odoptu Modules: PSTS, fabrication (Hyundai, S. Korea)

Odoptu field modules supply, installation, commissioning

SAKHALIN-1 Odoptu field development PHASE-2 construction, installation, commissioning

SAKHALIN-1 Chayvo OPF

SAKHALIN-2 Onshore Processing Facility (OPF)

SAKHALIN-2 PA and LUN - OPF Offshore pipeline

SAKHALIN-1 Odiptu field development Block Process Modules fabrication (Louisiana, USA) Pipelines Odoptu field - Chayvo OPF

SAKHALIN-1 Arkutun-Dagi Onshore pipelines

SAKHALIN-1 ENL Risk-based Integrity Inspection Control of equipment in operation (2009 through present)

1997 – 2002 | 2003 ——— 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 - 2022

SAKHALIN-2 Piltun-Astokhskaya OIFP (PA-A) Molikpaq fabrication

SAKHALIN-2 Piltun-Astokhskaya OIFP (PA-A) Molikpaq technical upgrade

SAKHALIN-1 Orlan OIFP

SAKHALIN-2 LUN-A OIFP Top sides fabrication, transportation, connection

SAKHALIN-2 SEIC Risk-based Integrity Inspection Control of equipment in operation (2008-2010)

SAKHALIN-1 Arkutun-Dagi Offshore pipelines

SAKHALIN-2 Technical Supervision over SEIC Production Facilities Technical Upgrade

SAKHALIN-2 SEIC Risk-based Integrity Inspection Control of equipment in operation

SAKHALIN-2 OPF Compression (OPFC)

SAKHALIN-1 De-Kastri Terminal Main pipeline from Chayvo OPF

SAKHALIN-2 PA-B OIFP Top sides fabrication, transportation, connection

SAKHALIN-1 Start of Arkutun-Dagi OIFP (Berkut) construction (Daewoo, South Korea) (2011 - 2014)

SAKHALIN-1 Arkutun-Dagi OIFP Berkut commissioning Sakhalin island (2014 - 2015)

Zvezda-DSME Shipyard Technical Supervision over Construction

Project: construction of the CDU/VDU Complex at the Gazpromneft-ONPZ site

Tengizchevroil Project, Kazakhstan Advanced Non-destructive Testing Services

SAKHALIN-2 Molikpaq OIFP connection to the onshore infrastructure

SAKHALIN-2 PA-B OIFP LUN-A OIFP

Concrete Base Structures fabrication, transportation, connection

SAKHALIN-2 Booster Statation No. 2 (BS - 2)

OIFP "A" as a part of "Kamennomyskoye-Sea gas field development" construction

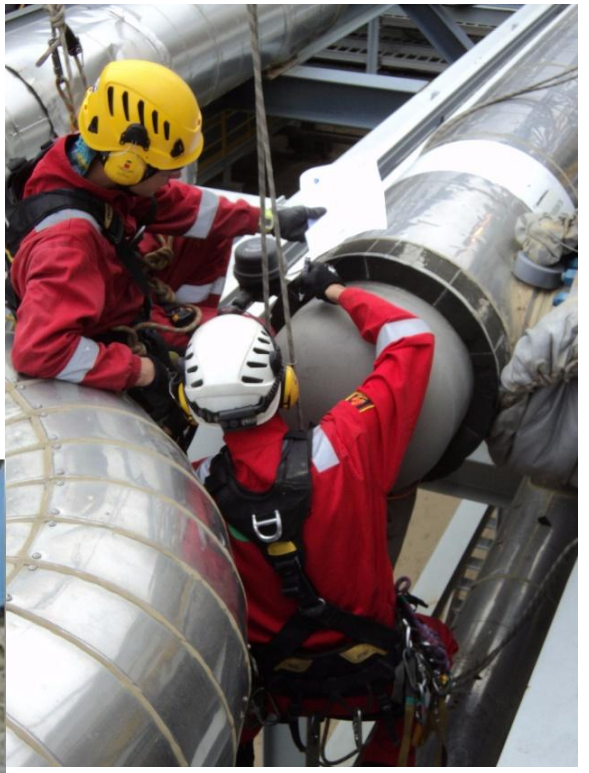
SAKHALIN-3 Kirinskoye Gas-Condensate field development (2022)

SAKHALIN-3 Yuzhno-Kirinskoye field development

ТЕХ ИНКОМ

EXPERIENCE CREATES PERFECTION

INSPECTION PROGRAMS AND ADVANCED NON-DESTRUCTIVE TESTING TECHNOLOGIES AS A GUARANTEE OF UNINTERRUPTED INDUSTRIAL EQUIPMENT OPERATION



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15 YEARS IN TESTING INDUSTRIAL EQUIPMENT INTEGRITY

ТЕХ ИНКОМ

TRADITIONAL NDT METHODS

NDT during manufacturing and operation:

- Visual and measurement testing
- Electric testing
- Radiography, Gamma/X-Ray
- Ultrasonic Testing
- Dye Penetrant Testing
- Magnetic Particle Testing
- Eddy-Current Testing
- Vacuum box leak testing
- Materials analysis, examination
- Destructive testing methods

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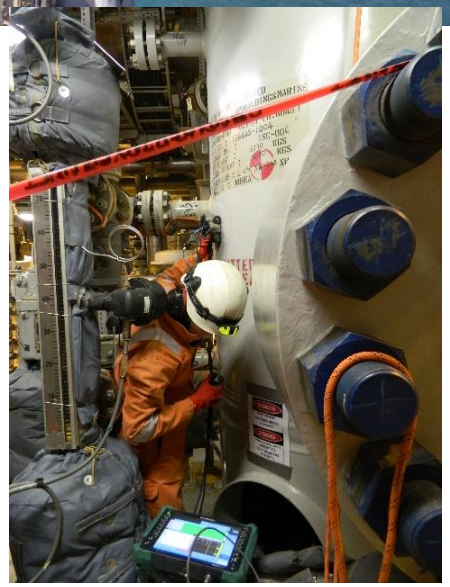
ADVANCED NDT METHODS

We constantly train and invest resources into specialized inspector teams:
- API inspections, Risk-Based approach engineers, field equipment inspectors
- All our specialists are multi-method

- Automated Ultrasonic C-Scan Corrosion Mapping - RMS
- Hydroform Phased Array Corrosion Mapping
- Flexoform Corrosion Mapping
- Floormap X- Tank corrosion Mapping MFL
- Digital Radiography
- Computer Radiography
- Long Range Ultrasonic pipe inspection-LRUT
- Alternating Current field measurement – ACFM
- PAUT and TOFD automated and manual welds inspection
- Flange Face Corrosion
- Bolt Inspection
- Pipeline AUT Inspection
- Advanced Tube Inspection Services
- Drone Inspection with Thermal Vision



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LONG RANGE ULTRASONIC PIPE INSPECTION-LRUT

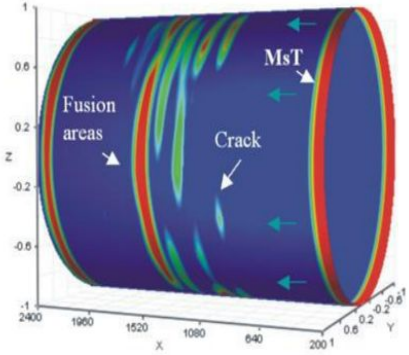
MsS technology allows for quick inspection of long stretches in order to determine defective areas. With this method, control is carried out from one point at which the sensor is located. The signal from the sensor is directed in both directions and spreads throughout the body of the controlled object. The signal responds to changes in the cross-sectional area of the object. The signal reflected from the defect is received by the sensor, and the result is displayed on the PC screen in the form of A-scan and C-scan scan.
The method allows you to accurately determine the distance to the defect from the point of the sensor location and its approximate size. Then double-check is performed by standard methods.

Pipe and tank inspection, monitoring:

The equipment allows for quick inspection of extended sections, sections going underground, pipelines on overpasses, underground pipelines, etc. up to 100m in length in both directions in a short time. As well as flat surfaces such as tanks without preliminary stripping.

Segmented MsT transducer

‘ C ‘ - scan imaging



Flare line mockup

ALTERNATING CURRENT FIELD MEASUREMENT – ACFM

Alternating current field measurement (ACFM) is an electromagnetic inspection technique that introduces an alternating current into the surface of a component to detect surface-breaking cracks.

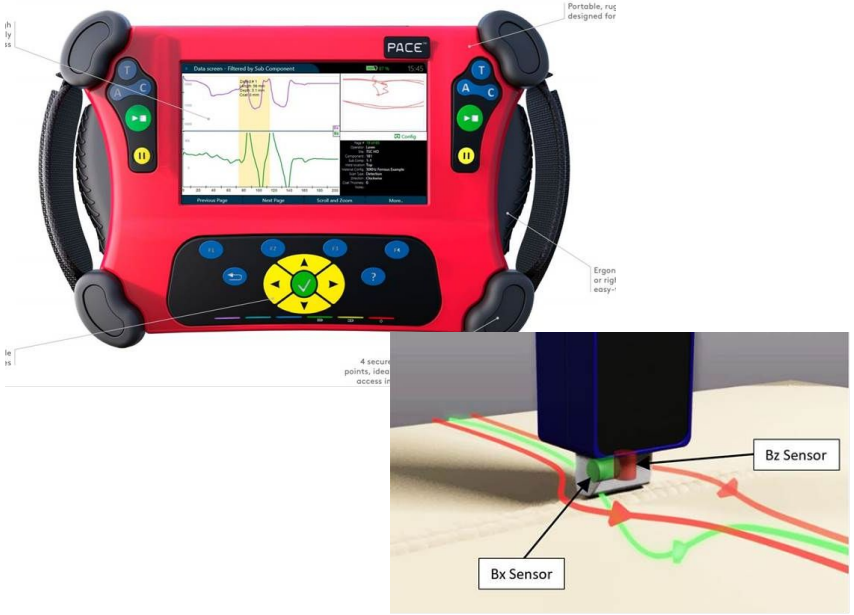
The presence of a crack disturbs the electromagnetic field and the return signal is instantaneously converted by advanced mathematical techniques so that operators are alerted to the presence of defects.

PACE Features:

- High crack detectability using the ACFM method.
- Accurate defect sizing.
- Inspection through coating is possible.
- Surface cleaning is not mandatory.
- No calibration on a reference block is necessary.
- Battery life: 8+ hours.
- Large strengthened high-brightness LCD display.
- Desktop and vehicle charger.
- Built-in 5 Mpixel camera.
- Designed to be operated by a single operation (right or left-handed).

Designed to meet the needs and performance of the operator across the oil & gas, power generation, rope access structural inspection industries and more...

Pace is a revolutionary portable instrument developed with the operator in mind through extensive field testing. It is extremely rugged, user-friendly, and ergonomic to deliver excellent data integrity for maximum confidence.



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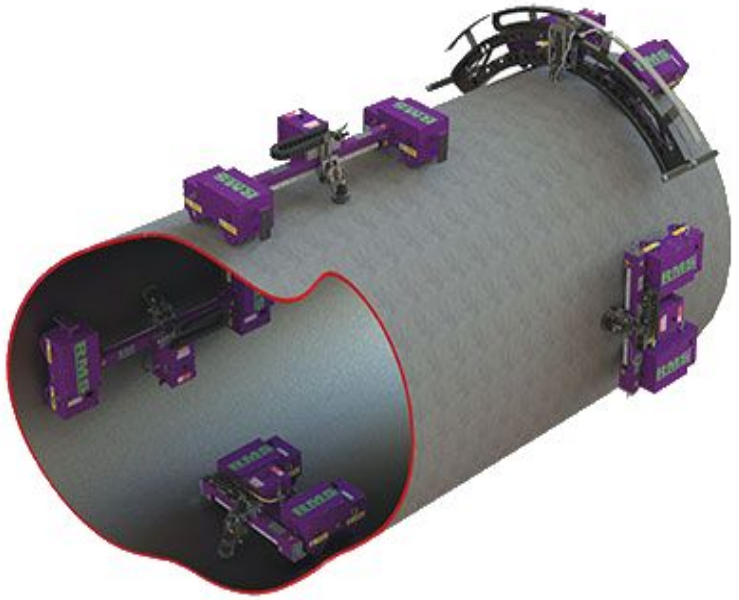
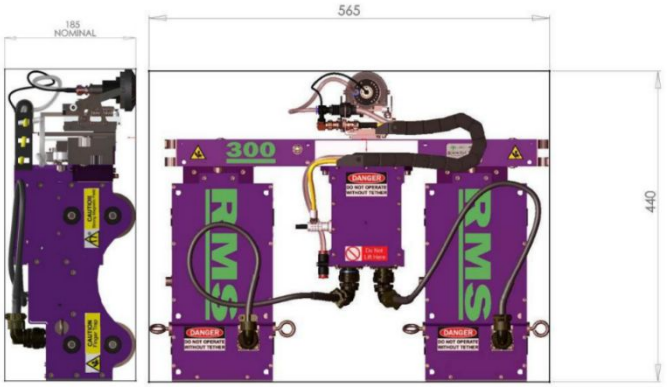
AUTOMATED ULTRASONIC C-SCAN CORROSION MAPPING - RMS

The robust, field-proven RMS robotic scanning head has beer successfully deployed on various assets such as storage tanks pressure vessels, pipelines and other critical structures in har environments including oil and gas, offshore and assets at temperatures up to 200°C (392°F).



- Highly Flexible Scanning and data acquisition settings
- High speed scanning of up to 7.8m2/h
- High accuracy scanning with resolution of 1mm x 1mm
- Advanced offline analysis and re-processing



HYDROFORM PHASED ARRAY CORROSION MAPPING

The HydroFORM™ is designed to offer the best inspection solution for the detection of wall-thickness reductions due to corrosion, abrasion, and erosion. This solution also detects mid-wall damage such as hydrogen-induced blistering or manufacturing-induced laminations, and easily differentiate these anomalies from loss of wall thickness.

- High-performance corrosion mapping for rough and uneven surfaces
- Easy gate synchronization with the front wall for OD and ID corrosion monitoring
- Wedge reflection is eliminated
- Coupling is optimized
- Provides excellent near-surface resolution

HydroFORM utilizes an ingenious water-column concept that eliminates the need for a wedge, thus providing the benefits of a phased array immersion-tank inspection. This concept, which uses a low-flow water supply and consumable gaskets, offers excellent surface conformance and optimized coupling conditions, even on rough surfaces.

FLEXOFORM PHASED ARRAY CORROSION MAPPING

Pipe elbows are susceptible to damage, such as from flow-accelerated corrosion (FAC), but inspecting them is challenging since their shape changes from convex to concave, and there are many possible pipe diameters. The FlexoFORM™ solution integrates flexible phased array probe technology in a scanner to solve these challenges. This solution can be used to collect easy-to-interpret data on elbows with diameters ranging from 4.5 in. OD up to flat and offers many benefits, including:

- 100% elbow coverage
- Intuitive 2D C-scan imaging
- High-resolution data (1 mm × 1 mm)
- Fast elbow wall thickness measurement
- Constant coupling maintained by water-column system

FLOORMAP X- TANK CORROSION MAPPING USING MFL

Floormap®X is the latest multi-technology MFL Array tank bottom solution. It offers an unmatched probability of detection – including in the critical zone – and can address thick plates and coatings. Thanks to patented STARS technology, it provides top/bottom corrosion discrimination.

- **Maximum coverage**, including critical zone (annular ring)
- **High-resolution** for increased Probability of Detection
- **Multi-technology** for top and bottom defect discrimination
- **Flexible scanning**, one scanner with three scan modes
- **Inspect thicker plates** up to 20 mm (3/4 in) thick
- **Unmatched reporting**, comprehensive and on-the-spot
- **10% reporting thresholds**, increase inspection intervals
- **EEMUA 159 and API 653** compliance

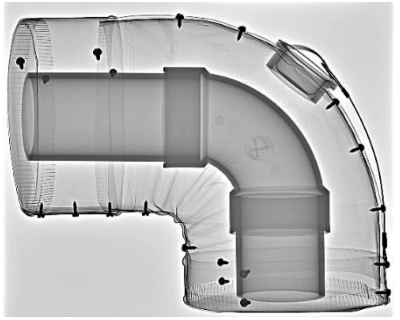
Multi-technology Array Solution

MFL Array: 64 channel, 128 multi-orientated MFL sensors, configuration. It produces a highest resolution imaging and market leading Probability of Detection (PoD). On its own, MFL cannot differentiate if the corrosion is top side or bottom side of the tank bottom.

STARS: The patented technology enabling the FloormapX to differentiate between the top side and bottom side corrosion and report them separately. STARS also generates detailed top surface image profiles, even in the presence of coating, thus contribute to vital tank integrity information.

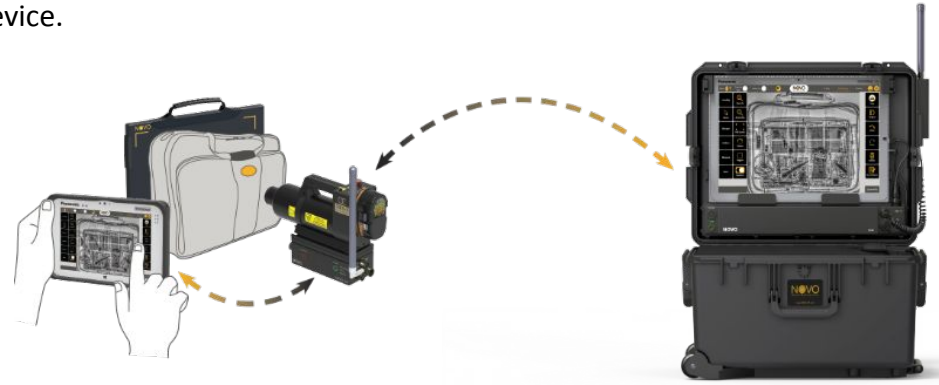
DIGITAL RADIOGRAPHY/COMPUTER RADIOGRAPHY

Industrial radiography has a multitude of applications as a method of nondestructive testing. In conventional radiography, an exposure is created on silver halide film. With advancements in technology, radiography can now be performed digitally. In digital radiography, a radiograph is not created on film, but with devices that produce an image made of pixels on a computer screen.



Computer Radiography (CR): In this process, an imaging plate is used instead of X-ray film. First, the image is stored on the plate in the form of photo sensitive storage phosphors. Then, a digitizer scans the plate with a laser beam, and the image information is released as visible light. Finally, this light is converted into a digital image. Any image that can be created with conventional X-ray films can also be created with computed radiography. Like conventional radiography, this method can be used in applications requiring flexibility to bend around a scanned component.

Digital Radiography (DR): In this process, the image is captured on a plate and directly transmitted to the computer. There are no intermediate steps required to capture the radiograph. This method can produce high resolution images, and can even produce real time results depending on the maker of the device.



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PAUT AND TOFD AUTOMATED AND MANUAL WELDS INSPECTION

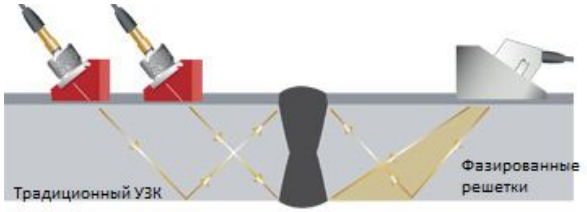
Ultrasonic phased array systems can potentially be employed in almost any test where conventional ultrasonic flaw detectors have traditionally been used. Weld inspection and crack detection are the most important applications, and these tests are done across a wide range of industries including aerospace, power generation, petrochemical, metal billet and tubular goods suppliers, pipeline construction and maintenance, structural metals, and general manufacturing. Phased arrays can also be effectively used to profile remaining wall thickness in corrosion survey applications.

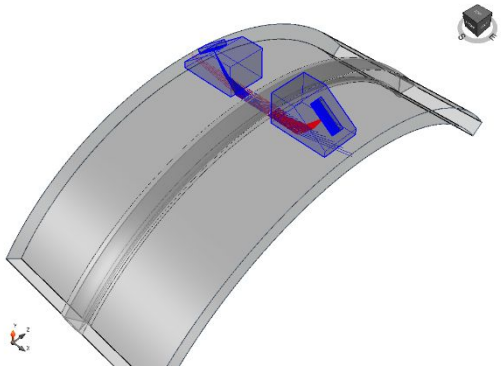
The benefits of phased array technology over conventional UT come from its ability to use multiple elements to steer, focus and scan beams with a single transducer assembly.

The small footprint of the transducer and the ability to sweep the beam without moving the probe also aids inspection of such components in situations where there is limited access for mechanical scanning. The ability to test welds with multiple angles from a single probe greatly increases the probability of detection of anomalies.

Electronic focusing permits optimizing the beam shape and size at the expected defect location, as well as further optimizing probability of detection.

The ability to focus at multiple depths also improves the ability for sizing critical defects for volumetric inspections.





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ADVANCED TUBE INSPECTION

In almost any nuclear, chemical, or mechanical system, heat must be transferred from one place to another or from one fluid to another. Heat Exchangers and Coolers are used to transfer heat from one fluid to another thus creating corrosion reactions depending of the fluid used. Non-destructive testing of tubing and surfaces relies on a number of techniques, which often depend on the application and the materials involved.

Technologies we offer:

- Eddy Current Testing (ECT)
- Eddy Current Array (ECA)
- Remote-Field Testing (RFT)
- Near-Field Testing (NFT)
- Near-Field Array (NFA)
- Magnetic Flux Leakage (MFL)
- Internal Rotating Inspection System (IRIS

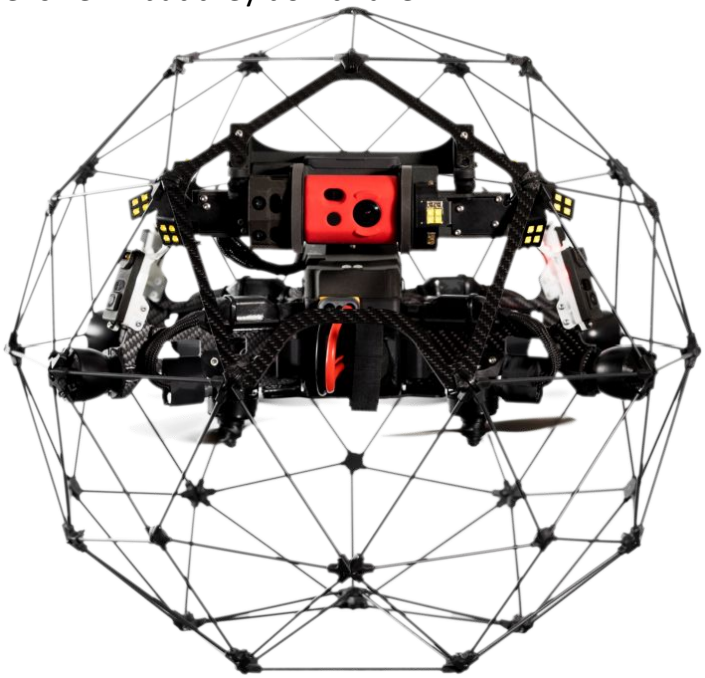
Дефект / Техника	ECT	ECA	IRIS	RFT	NFT	NFA	MFL	PSEC
Раковины на внут. поверх.	●	●	●	●	●	●	●	●
Раковины на внеш. поверх.	●	●	●	●	●	●	●	●
Продольные трещины	●	●	●	●	●	●	●	●
Трещины по окружности	●	●	●	●	●	●	●	●
Коррозия внутренней стенки	●	●	●	●	●	●	●	●
Коррозия внешней стенки	●	●	●	●	●	●	●	●
Дефекты трубной доски	●	●	●	●	●	●	●	●

● Применимо ● С ограничениями ● Не применимо

DRONE INSPECTION WITH THERMAL VISION

Visual inspections in confined spaces are known to be risky, long, and expensive — but they don't have to be.

- **Improve Safety**
  - Avoid confined spaces entry and work at height during visual inspections.
- **Reduce Downtime**
  - Turn days of asset downtime into hours.
- **Lower Cost**
  - Reduce your internal inspection costs by as much as 90%.



Thermal & 4k close-up inspection

When it comes to visual inspections, data is what matters. So, we've placed Elios 2 payload in the front cage-opening, fitted with a thermal and a 4K camera side by side. 12MP still and video recording gives you stunning detailed images with 0.18 mm/px resolution to spot the tiniest cracks from floor to ceiling.

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ROPE ACCESS INSPECTIONS

The ability to perform all the advanced inspections using rope access methods significantly increases the capabilities to assess the process equipment condition, releases the client from the necessity of building expensive scaffolding, and significantly expedites the organization and performance of all works.

ТЕХИНКОМ

Независимый общественный совет конкурса
«100 ЛУЧШИХ ОРГАНИЗАЦИЙ РОССИИ. ЭКОЛОГИЯ И ЭКОЛОГИЧЕСКИЙ МЕНЕДЖМЕНТ»

Организационный комитет XI ВСЕРОССИЙСКОЙ КОНФЕРЕНЦИИ «Экология и производство. Перспективы развития экономических механизмов охраны окружающей среды

Диплом

лауреата конкурса
«100 ЛУЧШИХ ОРГАНИЗАЦИЙ РОССИИ. ЭКОЛОГИЯ И ЭКОЛОГИЧЕСКИЙ МЕНЕДЖМЕНТ»

в номинации

«За повышение надежности нефтепромыслового оборудования и сооружений»

награждается

Общество с ограниченной ответственностью Инженерно-Консультативный Центр «ТЕХИНКОМ»

Председатель Независимого общественного совета, президент «Глобе-Интернешнл Россия», академик РАЕН, доктор физико-математических наук, профессор, депутат Госдумы РФ V и VI созывов
Шудегов Виктор Евграфович

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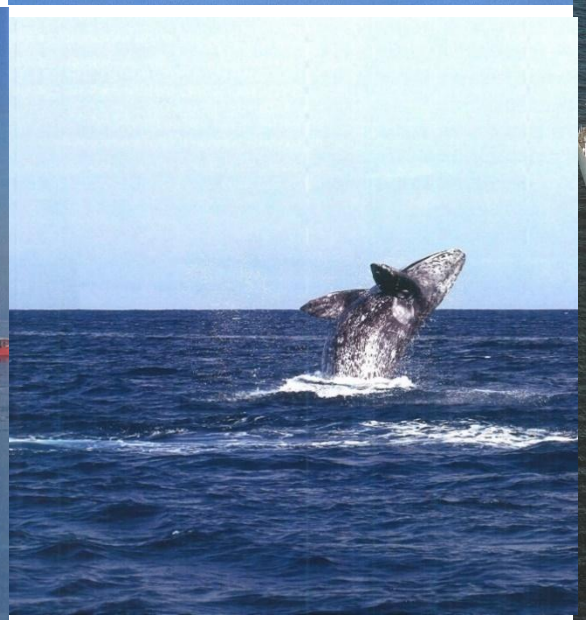
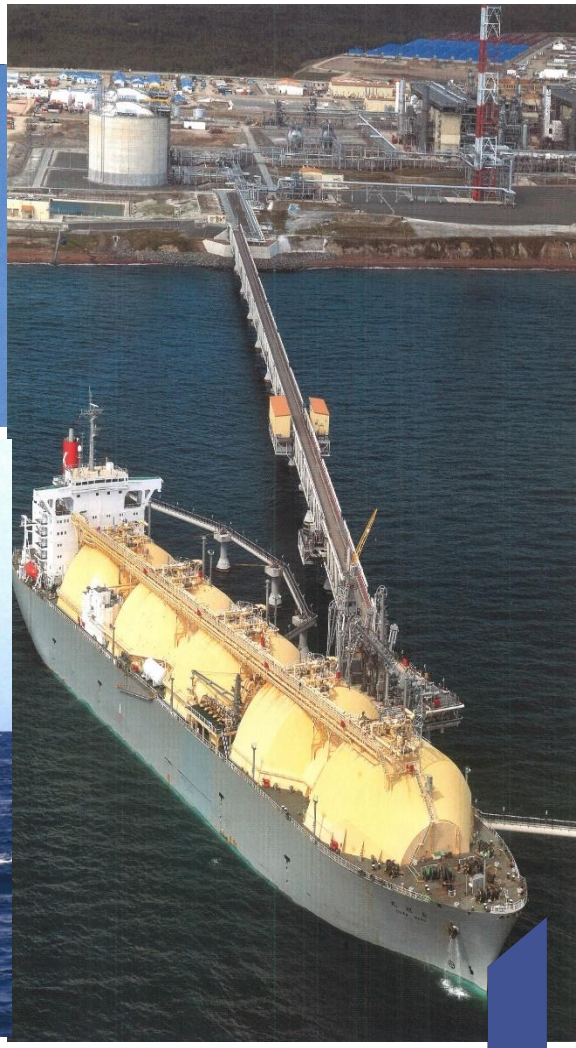
Кашапов Рауль Рифкатович

Санкт-Петербург
2017

For increasing the reliability of oilfield equipment and structures





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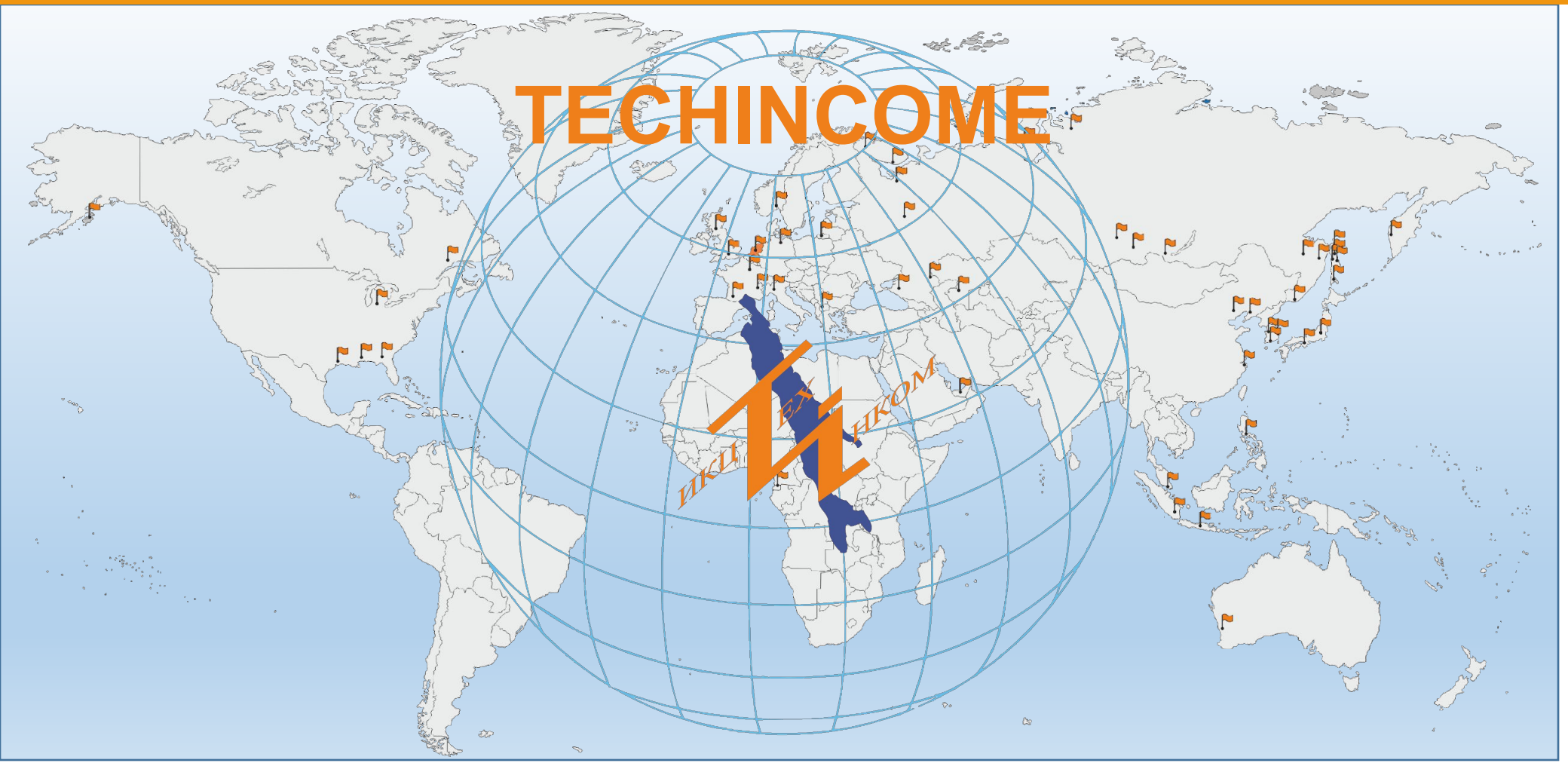

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