CERTivation

PIPELINE PERSONNEL CERTIFICATION

CANDIDATE HANDBOOK

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ABOUT THIS HANDBOOK

This Handbook contains all the policies and procedures of CERTivation GmbH nine certification programs. All those applying to take a certification exam must agree to comply with the information contained in this manual.

INTRODUCTION

Pipelines carrying gases and hazardous liquids are one of the safest forms of transportation; however, 'human error' is a contributing factor to some failures, and the training, testing, and qualification of pipeline employees is an important measure against failures caused by human error[1]. Indeed, pipeline standards and regulations require pipeline staff to be both competent and qualified in all the tasks they perform.[1,2]

The objective of this Pipeline Integrity Engineer certification program is the same as in the USA standard ASME B31Q [15]: '… to minimize the impact on safety and integrity of the pipeline due to human error that may result from an individual's lack of knowledge, skills, or abilities during the performance of certain activities.

The Pipeline Integrity Engineer Certification program is designed to identify engineers who can address pipeline integrity problems, with supervision as defined for each certification.

The duties, tasks, knowledge, skills, and attributes of a Pipeline Integrity Engineer can be summarized as:

- can assess defects reported in a pipeline, using and understanding best practices;
- give reasoned conclusions and recommendations on pipeline engineering critical assessment;
- write clear reports, understanding the objectives and consequences of his/her work; and,
- is able to engage with clients at meetings, and explain their work

The purpose of a certification is to ensure that an individual performing a job has sufficient and demonstrable capabilities (competencies) to perform correctly all tasks required of that job.

CERTIVATION & THE QPPI CERTIFICATION BOARD

CERTIVATION GmbH is a privately held company located in Lingen, Germany. CERTIVATION GmbH believes that ensuring the proper authority and autonomy for the certification body is of utmost importance to the credibility and integrity of the certification program.

CERTIVATION GmbH, the certification body, has granted to the Qualification Panel for the Pipeline Industry (QPPI) an independent panel of qualified subject matter experts (SMEs), to the development of all elements of the certification scheme, including but not limited to the eligibility criteria, recertification requirements.

The QPPI certification board is responsible for overseeing the development of a credible Pipeline Integrity Engineer Certification Program and for

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[1] Anon., 'Pipeline Personnel Qualification', American Society of Mechanical Engineers. ASME B31Q-2016. 2016.

[2] Anon., 'Pipeline Personnel Qualification', American Society of Mechanical Engineers. ASME B31Q-2016. 2016. Anon., 'Pipeline Transportation Systems for Liquids and Slurries', ASME B31.4 - 2016, American Society of Mechanical Engineers. New York USA. 2016. Anon., 'Gas Transmission and Distribution Piping Systems'. ASME B31.8 - 2016, American Society of Mechanical Engineers. New York USA. 2016. Anon., 'Oil and gas pipeline systems', CSA Z662-15, Canadian Standards Association. 2015. Anon., 'Petroleum and natural gas industries - Pipeline transportation systems - Recommended practice for pipeline life extension', Technical Specification. ISO/TS/12747. First edition. International Organization for Standardization.

2011. Anon., 'Pipeline systems. Part 4: Steel pipelines on land and subsea pipelines – Code of practice for integrity management', Published Document PD 8010-4:2012. British Standards Institution. 2012. Parfomak, P. W., 'DOT's Federal Pipeline Safety Program: Background and Key Issues for Congress', Congressional Research Service. 7-5700. R44201. May 20, 2016. https://fas.org/sgp/crs/misc/R44201.pdf. Also, http://dms.ntsb.gov/pubdms/. Anon., 'Pipeline Safety: Guidance on Training and Qualifications for the Integrity Management Program', 49 CFR Part 192. Docket No. PHMSA–2016–0067. Federal Register. Vol. 82. No. 67. April 10, 2017. http://www.viadata.com/rus32wdw/rus32.htm#t=RUS32%2FFederal_Register _Volume_82%2C_Number_67_(Monday%2C_April_10%2C_2017).htm https://primis.phmsa.dot.gov/comm/glossary/index.htm#Integrity

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ensuring the credentials meet high standards of ethical and professional practice for the industry.

The exams for the Pipeline Integrity Engineer Certification program follow the specifications set forth in the exam blueprint in accordance with the weights and numbers of items defined for each task.

The QPPI Certification Board selected qualified Subject Matter Experts (SMEs) to write, review and revise the test questions under the guidance of a psychometric consultant. SMEs were selected based on their demonstrated expertise and have be working in the field of pipeline integrity, or a similar field, at any level within their organization, and have more than 10 years' experience.

Periodic job analysis studies are conducted to identify and validate the knowledge and skills measured by the exam on an ongoing basis. For each certification, a national job analysis study will be conducted periodically to ensure that the exam's Body of Knowledge specific to each certification remains relevant and current.

CHANGES TO CERTIFICATION SCHEME

CERTIVATION GmbH will provide due notice to certificants any changes made to the any of the Pipeline Integrity Engineer Personnel Certifications due to due to changes in internal requirements or in response to changes in the relevant standards or regulatory requirements.

CERTIVATION GmbH will communicate the changes made in the certification schemes and inform all certificants of the changes within thirty-(30) days of such changes being approved by the QPPI Certification Board. Changes will also be publicized on the CERTIVATION GmbH website, and in the candidate handbook well in advance of the effective date of the changes, which will also be published.

Certificants will be required to demonstrate their competence of the new content. This verification will be done at recertification.

Minimum Language Recommendations

Applicants should have a minimum IELTS score of 6.0 before attempting to take any of the Pipeline Integrity Certification exams.

CEFR	IELTS	Cambridge English Scale	TOEFL iBT	TOEFL PBT	TOEFL CBT	TOEIC	Global Scale of English
C2	9.0	209+	118-120	667-677	290-300	975-990	86-90
	8.5	205-208	115-117	653-663	281-287	955-970	83-85
	8.0	200-204	110-114	637-650	270-279	905-945	79-82
C1	7.5	191-199	102-109	610-633	254-267	835-900	73-78
	7.0	185-190	96-101	590-607	242-252	785-830	65-72
	6.5	176-184	79-95	548-588	212-241	685-780	58-64
B2	6.0	169-175	60-78	498-546	171-211	570-680	50-57
	5.5	160-168	46-59	453-496	133-169	450-560	42-49
B1	5.0	154-161	35-45	417-450	107-131	365-440	36-41
	4.5	147-153	32-34	400-413	97-103	345-355	29-35
	4.0	140-146	28-31	387-398	87-95	310-335	
A2	3.5		25-27	337-383	80-85	290-305	n/a
	3.0		21-24	353-373	67-77	265-280	
A1	2.5	100-119	17-20	333-350	57-65	235-260	n/a

Figure 1. Minimum Language Recommendations

AVAILABLE CERTIFICATIONS

CERTIFIED IN PIPELINE ENGINEERING PRINCIPLES: CS_001F

Individuals with a certification in Pipeline Engineering Principles are able to describe pipeline-engineering principles, discuss best practices, and explain their bases.

CERTIFIED IN PIPELINE INSPECTION AND SURVEILLANCE: CS_005F

Individuals certified in Pipeline Inspection and Surveillance can describe differing pipeline inspection and surveillance methods, and compare the best methods.

CERTIFIED IN PIPELINE INTEGRITY MANAGEMENT: CS_014F

Individuals certified in Pipeline Integrity Management can define, and distinguish between, differing integrity management methods/techniques, particularly pipeline integrity management and systems, and can list the threats to pipeline safety, and the consequences of pipeline failure.

CERTIFIED IN PIPELINE DEFECT ASSESSMENT: CS_020F

Individuals certified in Pipeline Defect Assessment can describe pipeline integrity and pipeline defect assessments (for all types of defects found in pipelines), and can summarize and give examples of fatigue assessment.

CERTIFIED IN IN-LINE INSPECTION TECHNOLOGIES & PROCEDURES: CS_022F

Individuals certified in In-Line Inspection Technologies and Procedures can classify and summarize in-line inspection technologies and procedures.

CERTIFIED IN IN-LINE INSPECTION DATA ANALYSIS & REPORTING: CS_026F

Individuals certified in ILI Data Analysis and Reporting can explain ILI data analysis and reporting procedures.

CERTIFIED IN STRESS ANALYSIS: CS_030F

Individuals certified in Stress Analysis can describe and review pipeline stress analyses.

CERTIFIED IN FRACTURE MECHANICS: CS_032

Individuals certified in Fracture Mechanics can explain the history of fracture mechanics, its principles, models (elastic, elastic-plastic, and plastic), and differing models, defining the best assessment methods using fracture mechanics, and define and distinguish between the traditional approach to fatigue assessment, and the fracture mechanics approach to fatigue assessment.

CERTIFIED PIPELINE INTEGRITY ENGINEER

Individuals who achieve the Certified Pipeline Integrity Engineer status have demonstrated the experience, knowledge and skills (competencies) to identify and give reasoned conclusions and recommendations on pipeline integrity issues.

CERTIFIED IN PIPELINE ENGINEERING PRINCIPLES: CS001F

Certified in Pipeline Engineering Principles program was designed for individuals working in pipeline integrity who are able to describe pipeline-engineering principles, discuss best practices, and explain their bases.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE

100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Pipeline Engineering Principles designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions. The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Pipeline Engineering Principles examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Pipeline economics and pipeline safety statistics. **(10%)**

2. Pipeline standards, including their bases and development, linkage to Regulations, key content, purposes, location classification, high consequence areas, design factors, and inherent safety. **(12.5%)**

3. Line pipe manufacture, types, standards, and choice of coatings. **(12.5%)**

4. Fluid flow, fluid phases. **(10%)**

5. Material properties including strength, ductility, toughness, weldability, and metal fatigue. **(12.5%)**

6. Practical aspects of pipeline routing, and the pipeline construction process. **(10%)**

7. Pipeline operation, including control rooms, control systems, and leak detection. B**10%)**

8. Calculation of stresses on pipelines, including principal stresses, thermal stresses, and equivalent stresses. **(10%)**

9. Practical aspects of pipeline integrity management, including risk assessment and management, pressure testing, in-line inspection, and pipeline repair. **(12.5%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS001A: Pipeline Engineering Principles
Knowledge of
1. History of pipelines, types and uses of pipelines, and benefits.
2. Pipeline standards
3. Line pipe and coatings.
4. Pressure, pipeline fluids, pipeline hydraulics.
5. Material strength and ductility.
6. Pipeline integrity management.
7. Cause of stresses on pipelines, hoop stress design factor, operating and design pressure.

CS008A: Pipeline Hydraulics
Knowledge of
1. Flow assurance
2. States of matter and phases.
3. Fluid mechanics.
4. Pipeline economics.
5. Pressure and 'head'.
6. Compressibility.
7. Resistance to flow.
8. Fluid flow.
9. Wax and hydrate formation.
10. Increasing pressure (pumps and compressors).

CS009A: Pipeline Risk Management
Knowledge of

1. Risk management and risk assessment codes and standards.
2. Pipeline failure hazards for onshore and offshore pipelines.
3. Consequences of pipeline failure, for gas and liquid lines (onshore and offshore).
4. Risk tolerability and risk acceptance criteria.
5. Risk mitigation measures and industry best practice.

CS018A: Onshore Pipeline Construction
Knowledge of

1. History of pipeline construction and the 'spread' method.
2. Construction project planning, management, and overall project costs and timescales.
3. Laws and regulations.
4. Routing and permits.
5. Line pipe, fittings, and installations.
6. Crossings.
7. Working width, right of way (ROW).
8. Pipeline construction sequence (planning to completion) and construction activities.
9. Environmental considerations.
10. Safety considerations.

CS030A: Stress Analysis
Knowledge of

1. Loads, forces, moments.
2. Pressure, stress.
3. Stresses in pipelines caused by internal pressure and external loadings.
4. Stress versus strain.
5. Mechanical properties (strength, deformation, fracture).
6. Stressing guidelines in pipeline standards, including allowable stresses and design factors.

7. Effect of subsea environment, and stresses in risers.
8. Effect of ground movement on pipelines.

CS035A: Pipeline Testing
Knowledge of

1. Pressure testing components.
2. Pressure testing pipelines: history, methodology, types, procedures, purposes.
3. Pneumatic versus hydrostatic.
4. Mill testing of line pipe.
5. Pre-service testing and in-service testing.
6. Safety considerations.
7. Pressure testing levels (pressure/stress and hold periods).

CS036A: Onshore Pipeline Routing
Knowledge of

1. Basis of pipeline route selection, including environmental.
2. Laws, regulations, permissions, consultation, and approvals for pipeline routing.
3. Pipeline routeing in standards (e.g., ISO 13623).
4. Pipeline routing methodologies (corridors, routes, rights of way).
5. Pipeline routing considerations (including beneficial features, and constraints).
6. Locating above ground installations.

CERTIFIED IN PIPELINE INSPECTION & SURVEILLANCE: CS005F

Certified in Pipeline Inspection and Surveillance program was designed for individuals working in pipeline integrity who can describe differing pipeline inspection and surveillance methods, and compare the best methods.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE

100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

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TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in Pipeline Inspection and Surveillance designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions. The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Pipeline Inspection and Surveillance examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Project plan and cost budget for standard projects involving inspection and surveillance activities. **(12.5%)**

2. Able to recognize the different requirements and available solutions for different project applications (e.g. offshore vs. onshore / buried vs. above ground). (**15%**)

3. Able to select or specify appropriate inspection and surveillance techniques and services for different project applications. **(15%)**

4. Interpretation of inspection and surveillance activity findings, assessing their significance, and identify shortcomings. **(15%)**

5. Pipeline threats and solutions. **(15%)**

6. Future inspection and surveillance methods. **(15%)**

7. On-line monitoring of threats. **(12.5%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of

recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS005A: Pipeline Inspection and Surveillance
Knowledge of
1. External inspection methods (coating and cathodic protection, excavation, etc.).
2. External surveillance methods (aerial, walking, subsea (ROVs, etc.), etc.).
3. Internal inspection methods (in-line inspection tools)
4. Awareness methods of damage prevention (one-call, markers, etc.).
5. Threats to pipeline integrity.

CS021A: Non-Destructive Testing Technologies
Knowledge of
1. Material properties (mechanical, and magnetic for metals).
2. Screening principles.
3. Inspection (for geometry defects, metal loss, and cracks).
4. Magnetic particle testing.
5. Liquid penetrant testing
6. Other techniques (e.g., visual).
7. Radiographic testing (methods).
8. Electromagnetic testing (methods, general EC).
9. Ultrasonic testing (methods, piezo-electric UT).

CS022A: In-Line Inspection Technologies and Procedures
Knowledge of
1. History of pigging, and in-line inspection.
2. Pipelines, pigs and ILI: current and future.
3. Associated market including understanding the number of service providers and supply vs demand issues.
4. Components of an ILI (the pipeline, its environment, the vehicle, the mechanics and electronics of the vehicle, and the

data gathering, analysis, interpretation, and reporting) and how they affect performance.

CS023A: Pipeline Inspection Technologies and Procedures

Knowledge of
1. External pipeline inspection principles (techniques, technologies).
2. Internal pipeline inspection principles (techniques, technologies).
3. Environmental influences on pipeline integrity.
4. Threats to pipeline integrity.

CS_026A: ILI Data Analysis and Reporting

Knowledge of
Pipeline basics.
1. Overview of pipeline features and anomalies.
2. Overview of ILI technologies (UT, MFL, EMAT, etc.) and their respective application fields (geometric, volumetric and planar anomalies).
3. Pipeline tracking.
4. Understanding of ILI distance references, and the correlation to pipeline data.
5. Data quality and acceptance criteria.
6. Detection and sizing capabilities of the ILI technology (including sizing tolerances).
7. Overview of ILI anomaly classification,
8. Basics of anomaly interaction rules and pressure assessment.
9. Structure and content of ILI reports (Data Quality Report, Preliminary and Final Inspection Reports, etc.).
10. Applied in-ditch NDE technologies
11. Data quality and acceptance criteria

CS_027A: Pipeline Inspection Data Management

Knowledge of
1. External inspection methods (coating and cathodic protection, excavation, etc.).
2. Internal inspection methods (including in-line inspection tools)

3. Threats to pipeline integrity.
4. Pipeline inspection reporting and data management.

CS035A: Pipeline Testing

Knowledge of
1. Pressure testing components.
2. Pressure testing pipelines: history, methodology, types, procedures, purposes.
3. Pneumatic versus hydrostatic.
4. Mill testing of line pipe.
5. Pre-service testing and in-service testing.
6. Safety considerations.
7. Pressure testing levels (pressure/stress and hold periods).

CS046A: Pipeline Inspection Principles

Knowledge of
1. External pipeline inspection principles (techniques, technologies).
2. Internal pipeline inspection principles (techniques, technologies).
3. Environmental influences on pipeline integrity.
4. Threats to pipeline integrity.

CS048A: Pipeline Defects

Knowledge of
1. Line pipe welds (longitudinal and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2. Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3. Common pipeline construction related defects (e.g., misalignment) and their causes.
4. Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5. In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CERTIFIED IN PIPELINE INTEGRITY MANAGEMENT: CS014F

Certified in Pipeline Integrity Management program was designed for individuals working in pipeline integrity who can define, and distinguish between, differing integrity management methods/techniques, particularly pipeline integrity management and systems, and can list the threats to pipeline safety, and the consequences of pipeline failure.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

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Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in Pipeline Integrity Management designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions. The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Pipeline Integrity Management examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Different approaches to pipeline integrity management. **(10%)**

2. Standards' requirements (including ASME B31.8S, API 1160, API 1173, CSA Z662, DNV RP F116, BSI 8010-4, EN 16348). **(10%)**

3. Interpreting inspection and survey reports, and inspection, testing, maintenance, and surveillance options (all methods). **(10%)**

4. Risk reduction options, preventive measures and mitigations. **(10%)**

5. Establishing baseline inspection and testing intervals. **(10%)**

6. Defect assessment, including fatigue assessment. **(10%)**

7. Pipeline repair and rehabilitation, and repair program design. **(10%)**

8. Threats to pipeline integrity and the consequences of pipeline failure. **(10%)**

9. Critical data, missing data, treatment of uncertainty. **(10%)**

10. Emergency preparedness, emergency response, site investigation. **(10%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS005A: Pipeline Inspection and Surveillance
Knowledge of
1. External inspection methods (coating and cathodic protection, excavation, etc.).
2. External surveillance methods (aerial, walking, subsea (ROVs, etc.), etc.).
3. Internal inspection methods (in-line inspection tools)
4. Awareness methods of damage prevention (one-call, markers, etc.).
5. Threats to pipeline integrity.

CS006A: Onshore Laws, Regulations and Standards
Knowledge of
1. What are laws and regulations, processes, their differences, and importance?
2. Pipeline laws and regulations and standards: history, and development.
3. Pipeline standards and specifications, and linking them to regulations.
4. Minimum requirements in regulations and standards.
5. Typical contents of laws and regulations for pipelines.
6. Pipeline standards: purposes, intent.

CS014A: Pipeline Integrity Management

Knowledge of

1. Pipeline integrity management system.
2. Safety Management Systems (SMS) and the role they play in Pipeline Integrity Management.
3. Threats to pipeline integrity (pipeline defects and their causes).
4. Inspection, testing, maintenance, and surveillance options (focus on in line inspection, above ground and subsea surveys and patrols).
5. Risk assessment (probability of failure, failure consequences).
6. Integrity management planning (prescriptive, risk based).
7. Pipeline integrity data management, data quality.

CS022A: In-Line Inspection Technologies and Procedures

Knowledge of

1. History of pigging, and in-line inspection.
2. Pipelines, pigs and ILI: current and future.
3. Associated market including understanding the number of service providers and supply vs demand issues.
4. Components of an ILI (the pipeline, its environment, the vehicle, the mechanics and electronics of the vehicle, and the data gathering, analysis, interpretation, and reporting) and how they affect performance.

CS027A: Pipeline Inspection Data Management

Knowledge of

1. External inspection methods (coating and cathodic protection, excavation, etc.).
2. Internal inspection methods (including in-line inspection tools)
3. Threats to pipeline integrity.
4. Pipeline inspection reporting and data management.

CS032A: Fracture Mechanics

Knowledge of

1. History of fracture mechanics.
2. Material properties, including ductile and brittle fracture, and transition curves. Strength, toughness, and ductility.
3. Structural mechanics, stress, strain, Strength. Effect of notches and cracks on structures.
4. Linear elastic fracture mechanics, and the stress intensity factor.
5. Fatigue predictions using S-N curves and fracture mechanics crack growth.
6. Effects of environment on fracture and fatigue.

CS033A: Failure Analysis

Knowledge of

1. Material properties (strength, ductility, hardness, and toughness).
2. The ductile to brittle transition of steel.
3. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
4. Modes (e.g., buckling) and mechanisms of failure (including corroison, and fatigue).
5. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion).
6. Chain of custody.
7. Human factors in failures (e.g., CSA's EXP248-2015.)
8. Failure site investigations and protecting evidence.
9. Site safety following a failure.

CS035A: Pipeline Testing

Knowledge of

1. Pressure testing components.
2. Pressure testing pipelines: history, methodology, types, procedures, purposes.
3. Pneumatic versus hydrostatic.
4. Mill testing of line pipe.
5. Pre-service testing and in-service testing.
6. Safety considerations.
7. Pressure testing levels (pressure/stress and hold

CERTIFIED IN PIPELINE DEFECT ASSESSMENT MANAGEMENT: CS020F

Certified in Pipeline Defect Assessment program was designed for individuals working in pipeline integrity who can describe pipeline integrity and pipeline defect assessments (for all types of defects found in pipelines), and can summarize and give examples of fatigue assessment

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE

100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in Pipeline Defect Assessment designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions.

The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Pipeline Defect Assessment examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Material properties (with a detailed focus on fracture toughness). **(12.5%)**

2. Fracture mechanisms (brittle, transitional, ductile), and fracture mechanics approaches (including J integral and crack tip opening displacement). **(12.5%)**

3. Assessment of corrosion using ASME B31G, assessment of cracks using API 579/BS 7910, and assessment of mechanical damage. **(12.5%)**

4. Pipeline failure causes (including external interference, external forces, corrosion, fatigue, ground movement, sabotage, theft, human error (including over-pressure, over-temperature), spanning, hydrodynamic loads, buckling, and thermal stressing). **(15%)**

5. Effect of hydrotesting on defect behavior. **(12.5%)**

6. Commercial, corporate, political, and sabotage threats to pipelines and facilities. **(10%)**

7. Case studies in pipeline failures, modes, and mechanisms. **(12.5%)**

8. Corrosion growth and fatigue crack growth models. **(12.5%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS012A: Pipeline Repair
Knowledge of
1. Methods and techniques for onshore and sub-sea pipeline repairs.
2. Defect failure modes and how repair methods provide support to the defect.
3. Standard pressure reduction requirements prior to, and during, repair.
4. Budgeting time and cost factors comparing cut-out with live repairs.
5. Permanent versus temporary repairs.
6. Structural versus pressure containment repairs.

CS020A: Pipeline Defect Assessment
Knowledge of
1. Material properties (strength, ductility, hardness, and toughness).
2. Fracture mechanics: history, key parameters, methods, and published good practices.
3. Stress analysis (internal pressure and external loading).
4. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
5. Types of failure (including ductile, brittle, overload, and fatigue).
6. Case studies in major pipeline failures.

7. Corrosion assessment, crack assessment, mechanical damage assessment.
8. Crack management in pipelines.

CS030A: Stress Analysis
Knowledge of

1 Loads, forces, moments.
2 Pressure, stress.
3 Stresses in pipelines caused by internal pressure and external loadings.
4 Stress versus strain.
5 Mechanical properties (strength, deformation, fracture).
6 Stressing guidelines in pipeline standards, including allowable stresses and design factors.
7 Effect of subsea environment, and stresses in risers.
8 Effect of ground movement on pipelines.

CS032A: Fracture Mechanics
Knowledge of

1 History of fracture mechanics. Material properties, including ductile and brittle fracture, and transition curves. Strength, toughness, and ductility.
2 Structural mechanics, stress, strain, strength. Effect of notches and cracks on structures.
3 Linear elastic fracture mechanics, and the stress intensity factor.
4 Fatigue predictions using S-N curves and fracture mechanics crack growth.
5 Effects of environment on fracture and fatigue.

CS033A: Failure Analysis
Knowledge of

1 Material properties (strength, ductility, hardness, and toughness).
2 The ductile to brittle transition of steel.
3 Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
4 Modes (e.g., buckling) and mechanisms of failure (including corrosion, and fatigue).
5 Failure mechanisms and their causes (including cracking, corrosion growth, and erosion).

6 Chain of custody.
7 Human factors in failures (e.g., CSA's EXP248-2015.)
8 Failure site investigations and protecting evidence.
9 Site safety following a failure.

CS042A: Failure Modes and Mechanisms
Knowledge of

1 Why failures occur.
2 Loading types (tension, torsion, compression, etc.)
3 Brittle and ductile failures.
4 Failure modes (collapse, buckling), and failure modes from pressure loading (leak, etc.).
5 Failure mechanisms (including corrosion and fatigue)
6 Modes of failure (including ductile, brittle, overload, and fatigue).
7 Failure mechanisms and their causes (including cracking, corrosion growth, and erosion), modes, and final failure.

CS048A: Pipeline Defects
Knowledge of

1 Line pipe welds (longitudinal, and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2 Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3 Common pipeline construction related defects (e.g., misalignment) and their causes.
4 Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5 In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CS050A: Crack Management

Knowledge of

1. Material properties (strength, toughness, etc.) that are needed to understand the effect of cracks.
2. Types and causes of cracks in pipelines (from line pipe manufacture, to construction, to operation).
3. Crack assessment/management standards (API 579, API 1176, etc.).
4. Examples of failures caused by cracking in pipelines
5. Crack management in a pipeline (identifying, assessing, prioritizing, reassessment, mitigation,

CERTIFIED IN IN-LINE INSPECTION TECHNOLOGIES & PROCEDURES: CS022F

Certified in In-Line Inspection Technologies & Procedures program was designed for individuals working in pipeline integrity who can classify and summarize in-line inspection technologies and procedures.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION
Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE
100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING
Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in In-Line Inspection Technologies & Procedures designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions.

The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the In-Line Inspection Technologies & Procedures examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Different pipeline types used to convey hydrocarbon products (e.g., production, export, transmission and distribution), their key features, and general operating characteristics that affect pigging and in-line inspection. **(12.5%)**

2. Different line pipe types, pipeline construction concepts (e.g., launcher/receivers, and other related facilities). **(12.5%)**

3. Familiarity with different ILI tools/technologies and their relative strengths and weaknesses. **(12.5%)**

4. The service providers, the major suppliers, and their individual capabilities. **(12.5%)**

5. Major pipeline threats and the associated damage mechanisms. **(12.5%)**

6. Major project phases required to execute a successful ILI campaign. **(12.5%)**

7. Familiarity with standard ILI data analysis methodology. **(12.5%)**

8. Industry standards pertaining to ILI pigging. **(12.5%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS006A: Onshore Laws, Regulations and Standards
Knowledge of
1. What are laws and regulations, processes, their differences, and importance?
2. Pipeline laws and regulations and standards: history, and development.
3. Pipeline standards and specifications, and linking them to regulations.
4. Minimum requirements in regulations and standards.
5. Typical contents of laws and regulations for pipelines.
6. Pipeline standards: purposes, intent.

CS021A: Non-Destructive Testing Technologies
Knowledge of
1. Material properties (mechanical, and magnetic for metals).
2. Screening principles.
3. Inspection (for geometry defects, metal loss, and cracks).
4. Magnetic particle testing.
5. Liquid penetrant testing
6. Other techniques (e.g., visual).
7. Radiographic testing (methods).
8. Electromagnetic testing (methods, general EC).
9. Ultrasonic testing (methods, piezo-electric UT).

CS022A: In-Line Inspection Technologies and Procedures
Knowledge of

1. History of pigging, & in-line inspection.
2. Pipelines, pigs and ILI: current and future.
3. Associated market including understanding the number of service providers and supply vs demand issues.
4. Components of an ILI (the pipeline, its environment, the vehicle, the mechanics and electronics of the vehicle, and the data gathering, analysis, interpretation, and reporting and how they affect performance.

CS023A: Pipeline Inspection Technologies and Procedures
Knowledge of

1. External pipeline inspection principles (techniques, technologies).
2. Internal pipeline inspection principles (techniques, technologies).
3. Environmental influences on pipeline integrity.
4. Threats to pipeline integrity.

CS025A: Cathodic Protection and Monitoring
Knowledge of

1. Basics of electricity, electrical laws, electrochemistry, corrosion, and CP theory.
2. CP system components.
3. Basic report preparation, & recordkeeping.
4. Safety issues specific to CP.
5. Main regulations and standards related to CP.

CS026A: ILI Data Analysis and Reporting
Knowledge of

1. Pipeline basics.
2. Overview of pipeline features and anomalies.
3. Overview of ILI technologies (UT, MFL, EMAT, etc.) and their respective application fields (geometric, volumetric and planar anomalies).
4. Pipeline tracking.
5. Understanding of ILI distance references, & the correlation to pipeline data.
6. Data quality and acceptance criteria.

7. Detection and sizing capabilities of the ILI technology (including sizing tolerances).
8. Overview of ILI anomaly classification,
9. Basics of anomaly interaction rules and Pressure assessment.
10. Structure and content of ILI reports (Data Quality Report, Preliminary and Final Inspection Reports, etc.).
11. Applied in-ditch NDE technologies
12. Data quality and acceptance criteria

CS027A: Pipeline Inspection Data Management
Knowledge of

1. External inspection methods (coating & cathodic protection, excavation, etc.).
2. Internal inspection methods (including in-line inspection tools)
3. Threats to pipeline integrity.
4. Pipeline inspection reporting and data management.

CS048A: Pipeline Defects
Knowledge of

1. Line pipe welds (longitudinal, and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2. Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3. Common pipeline construction related defects (e.g., misalignment) and their causes.
4. Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5. In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CS050A: Crack Management

Knowledge of

1. Material properties (strength, toughness, etc.) that are needed to understand the effect of cracks.
2. Types and causes of cracks in pipelines (from line pipe manufacture, to construction, to operation).
3. Crack assessment / management standards (API 579, API 1176, etc.).
4. Examples of failures caused by cracking in pipelines.
5. Crack management in a pipeline (identifying, assessing, prioritizing, reassessment, mitigation, repair).

CS051A: Geo-technics

Knowledge of

1. Basics of soil types including typical properties and influence on loads and stability.
2. Loads from pipeline installation, including depth of cover & trench shape.
3. Definition of soil – pipe interaction based on direction and influence of soil type
4. Influence of environment on instability and considerations of pipeline routing and hazard mitigation.
5. Range of geo-hazards including uncontrolled events, influence of man and loads generated by civil engineering activity.
6. How geo-hazards are detected and methods to monitor movement and the effects on pipelines.

CERTIFIED IN IN-LINE INSPECTION DATA ANALYSIS & REPORTING: CS026F

Certified in In-Line Inspection Data Analysis & Reporting program was designed for individuals working in pipeline integrity who can explain ILI data analysis and reporting procedures

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE

100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in In-Line Inspection Data Analysis & Reporting designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions.

The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the In-Line Inspection Data Analysis & Reporting examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Pipe materials (steel grades, design parameters, etc.) and pipeline components (weld types, installation, etc.). **(7.5%)**

2. Pipeline anomaly categories (geometrical, volumetric, planar). **(7.5%)**

3. ILI technologies, theoretical base of the underlying NDE principles, and their performance specification. **(10%)**

4. Pipeline tracking and assessment of AGM marker. **(7.5%)**

5. Correlation of different ILI runs by girth weld list comparison. **(7.5%)**

6. Correlation of inspection pipe tally to pipeline data. **(7.5%)**

7. Assessment of ILI data quantity (data loss) and quality (e.g., signal strength). **(10%)**

8. Interpretation and classification of pipeline anomalies and components, as well as indications of their origin (dirt, debris, objects, noise, etc.). **(7.5%)**

9. Sizing of anomaly dimensions (depth, length, width, etc.). **(10%)**

10. Anomaly interaction rules and failure pressure assessment standards. **(7.5%)**

11. Compilation of standard ILI reports with statistical charts and tables. **(7.5%)**

12. Cataloging field verification results and comparison to ILI results. **(10%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS015A: Internal Corrosion Mechanisms
Knowledge of
1. Corrosion principles basics.
2. Types of corrosion.
3. Types of pipeline internal corrosion.
4. Pipeline internal environment impact of corrosion.
5. Corrosion growth rates.
6. Measuring corrosion (e.g., by coupons).
7. Effect of water in crude oil, products, and natural gas.

CS021A: Non-Destructive Testing Technologies
Knowledge of
1. Material properties (mechanical, and magnetic for metals).
2. Screening principles.
3. Inspection (for geometry defects, metal loss, and cracks).
4. Magnetic particle testing.
5. Liquid penetrant testing
6. Other techniques (e.g., visual).
7. Radiographic testing (methods).

8. Electromagnetic testing (methods, general EC).
9. Ultrasonic testing (methods, piezo-electric UT).

CS022A: In-Line Inspection Technologies and Procedures
Knowledge of
1. History of pigging, and in-line inspection.
2. Pipelines, pigs and ILI: current and future.
3. Associated market including understanding the number of service providers and supply vs demand issues.
4. Components of an ILI (the pipeline, its environment, the vehicle, the mechanics and electronics of the vehicle, and the data gathering, analysis, interpretation, and reporting) and how they affect performance.

CS023A: Pipeline Inspection Technologies and Procedures
Knowledge of
1. External pipeline inspection principles (techniques, technologies).
2. Internal pipeline inspection principles (techniques, technologies).
3. Environmental influences on pipeline integrity.
4. Threats to pipeline integrity.

CS024A: Pipeline Preparation and Cleaning
Knowledge of
1. Pipeline lifecycle.
2. Pipelines types, configurations, products carried.
3. History of pigging.
4. What is a pig?
5. Pig types and function (including gauging pigs).
6. Pipeline piggability, system constraints, modifications required.
7. Pig handling, launching and receiving.
8. Pig traps and sites.
9. Site safety.

CS026A: ILI Data Analysis and Reporting
Knowledge of
1. Pipeline basics.
2. Overview of pipeline features and anomalies.
3. Overview of ILI technologies (UT, MFL, EMAT, etc.) and their respective application fields (geometric, volumetric and planar anomalies).
4. Pipeline tracking.
5. Understanding of ILI distance references, and the correlation to pipeline data.

CS027A: Pipeline Inspection Data Management
Knowledge of
1. External inspection methods (coating and cathodic protection, excavation, etc.).
2. Internal inspection methods (including in-line inspection tools)
3. Threats to pipeline integrity.
4. Pipeline inspection reporting and data management.

CS034A: Pipeline Welding
Knowledge of
1. History of welding, and its development in pipelines
2. Welding basics, processes, and types.
3. Effect of welding on materials' properties, and the heat affected zone.
4. Pipeline welding standards.
5. Types of weld imperfections.
6. Line pipe welds, and pipeline girth welds.
7. Principals of non-destructive testing of welds.
8. Pipeline welding QA/QC and records. Welding health and safety (including welding hazards, protective clothing, and safety equipment).

CS042A: Failure Modes and Mechanisms

Knowledge of

1. Why failures occur.
2. Loading types (tension, torsion, compression, etc.)
3. Brittle and ductile failures.
4. Failure modes (collapse, buckling), and failure modes from pressure loading (leak, etc.).
5. Failure mechanisms (including corrosion and fatigue)
6. Modes of failure (including ductile, brittle, overload, and fatigue).
7. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion), modes, and final failure.

CS046A: Pipeline Inspection Principles

Knowledge of

1. External pipeline inspection principles (techniques, technologies).
2. Internal pipeline inspection principles (techniques, technologies).
3. Environmental influences on pipeline integrity.
4. Threats to pipeline integrity.

CS048A: Pipeline Defects

Knowledge of

1. Line pipe welds (longitudinal, and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2. Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3. Common pipeline construction related defects (e.g., misalignment) and their causes.
4. Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5. In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CERTIFIED IN STRESS ANALYSIS: CS030F

Certified in Stress Analysis program was designed for individuals working in pipeline integrity who can describe and review pipeline stress analyses.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION
Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE
100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in Stress Analysis designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions.

The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Stress Analysis examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Principal stresses, equivalent stresses, thermal stress, residual stresses (primary and secondary stresses). **(12.5%)**

2. Pipeline stress analysis methods and software (elastic). **(12.5%)**

3. Derivation of pipeline stresses from first principles. **(10%)**

4. True stress-strain. **(12.5%)**

5. Design for fatigue. **(12.5%)**

6. Stress analysis using pipeline standards, and pipeline standards' methods, and their bases. **(12.5%)**

7. Wall thickness calculations. **(15%)**

8. Soil-pipe interactions, effect of sea bed conditions. **(12.5%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline

integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS008A: Pipeline Hydraulics
Knowledge of
1. Flow assurance
2. States of matter and phases.
3. Fluid mechanics.
4. Pipeline economics.
5. Pressure and 'head'.
6. Compressibility.
7. Resistance to flow.
8. Fluid flow.
9. Wax and hydrate formation.
10. Increasing pressure (pumps and compressors).

CS018A: Onshore Pipeline Construction
Knowledge of
1. History of pipeline construction and the 'spread' method.
2. Construction project planning, management, and overall project costs and timescales.
3. Laws and regulations.
4. Routing and permits.
5. Line pipe, fittings, and installations.
6. Crossings.
7. Working width, right of way (ROW).
8. Pipeline construction sequence (planning to completion) and construction activities.
9. Environmental considerations.
10. Safety considerations.

CS020A: Pipeline Defect Assessment
Knowledge of

1. Material properties (strength, ductility, hardness, and toughness).
2. Fracture mechanics: history, key parameters, methods, and published good practices.
3. Stress analysis (internal pressure and external loading).
4. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
5. Types of failure (including ductile, brittle, overload, and fatigue).
6. Case studies in major pipeline failures.
7. Corrosion assessment, crack assessment, mechanical damage assessment.
8. Crack management in pipelines.

CS030A: Stress Analysis
Knowledge of

1. Loads, forces, moments.
2. Pressure, stress.
3. Stresses in pipelines caused by internal pressure and external loadings.
4. Stress versus strain.
5. Mechanical properties (strength, deformation, fracture).
6. Stressing guidelines in pipeline standards, including allowable stresses and design factors.
7. Effect of subsea environment, and stresses in risers.
8. Effect of ground movement on pipelines.

CS032A: Fracture Mechanics
Knowledge of

1. History of fracture mechanics. Material properties, including ductile and brittle fracture, and transition curves. Strength, toughness, and ductility.
2. Structural mechanics, stress, strain, strength. Effect of notches and cracks on structures.
3. Linear elastic fracture mechanics, and the stress intensity factor.
4. Fatigue predictions using S-N curves and fracture mechanics crack growth.

5. Effects of environment on fracture and fatigue.

CS033A: Failure Analysis
Knowledge of

1. Material properties (strength, ductility, hardness, and toughness).
2. The ductile to brittle transition of steel.
3. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
4. Modes (e.g., buckling) and mechanisms of failure (including corroison, and fatigue).
5. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion).
6. Chain of custody.
7. Human factors in failures (e.g., CSA's EXP248-2015.)
8. Failure site investigations and protecting evidence.
9. Site safety following a failure.

CS042A: Failure Modes and Mechanisms
Knowledge of

1. Why failures occur.
2. Loading types (tension, torsion, compression, etc.)
3. Brittle and ductile failures.
4. Failure modes (collapse, buckling), and failure modes from pressure loading (leak, etc.).
5. Failure mechanisms (including corrosion and fatigue)
6. Modes of failure (including ductile, brittle, overload, and fatigue).
7. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion), modes, and final failure.

CS048A: Pipeline Defects

Knowledge of

1. Line pipe welds (longitudinal, and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2. Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3. Common pipeline construction related defects (e.g., misalignment) and their causes.
4. Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5. In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CS051A: Geo-technics

Knowledge of

1. Basics of soil types including typical properties and influence on loads and stability.
2. Loads from pipeline installation, including depth of cover and trench shape.
3. Definition of soil – pipe interaction based on direction and influence of soil type
4. Influence of environment on instability and considerations of pipeline routeing and hazard mitigation.
5. Range of geo-hazards including uncontrolled events, influence of man and loads generated by civil engineering activity
6. How geo-hazards are detected, and methods to monitor movement and the effects on pipelines.

CERTIFIED IN FRACTURE MECHANICS: CS032F

Certified in Fracture Mechanics program was designed for individuals working in pipeline integrity can explain the history of fracture mechanics, its principles, models (elastic, elastic-plastic, and plastic), and differing models, defining the best assessment methods using fracture mechanics, and define and distinguish between the traditional approach to fatigue assessment, and the fracture mechanics approach to fatigue assessment.

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

Without higher education degree:
Four (4) years of pipeline engineering principles requires completed EXPERIENCE IN LIEU OF DEGREE VERIFICATION AFFIDAVIT form.

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education or engineering degree or international equivalent from an accredited institution of higher education.
Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

EXPERIENCE

100 hours of experience or self-learning under the supervision of a line manager.

Experience is defined as work activity accomplished under the direction of qualified supervision, but excluding time spent in organized training programs, training and mentoring requirements.

MENTORING

Applicants are required to have 36 hours of documented mentoring (guided learning) under the guidance of a mentor. A mentoring verification affidavit must be submitted with the application.

A 'mentor' is a trusted adviser, with the necessary knowledge and wisdom to provide advice and guidance. He/she is a critical friend, or guide, who is responsible for overseeing the career and development of another person, outside the normal manager/subordinate relationship. Mentoring differs from coaching: coaching transfers knowledge, but it has a fixed agenda, related to a task, with a clear outcome, usually short term, and focused on a competency. Mentoring does not have a fixed agenda, it is related to the development of an individual, without a variable outcome, is long term, and focused on the individual. This means that mentoring can be a structured process, but does not need to be formal.

TRAINING

Applicants are required to have 18 hours of training in the competency topic in which they are applying.

Candidates are free to select any training they wish. Completion of any ROSEN Group's training courses will not provide any advantage over completion from any other training program.

Training must have identified goals and objectives defined by a training department, or training provider. Examples include classroom instruction, web-based training, e-learning courses, workshops, seminars, webinars, in-house training, etc. 1 CEU = 10 hours of participation.

Mandatory acceptable evidence includes copies of training certificates or letters of completion.

BODY OF KNOWLEDGE

To be awarded the Certified in Fracture Mechanics designation, a candidate must pass a comprehensive examination consisting of forty-(40) multiple-choice questions.

The importance of each knowledge, and skills areas (KSA) within it, determines the specifications of the Fracture Mechanics examination. The relative order of importance of the KSAs determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is one-(1) hour.

KNOWLEDGE OF

1. Quantitative and qualitative toughness and interpreting fracture toughness (Kmat) from Charpy and toughness data, using standard correlations. Fracture toughness testing. **(12.5%)**

2. Identify primary and secondary stresses, toughness, and other inputs to a fracture analysis. **(12.5%)**

3. Stress fields at crack tips, and elastic-plastic fracture using K, J, or CTOD. Relationship between K, J and CTOD. **(12.5%)**

4. FADs for fracture and collapse. Choice of FAD, inclusion of residual stress, effects of pressure testing and PWHT on inputs. **(10%)**

5. Can carry out fatigue analyses by S-N or fracture mechanics methods, including environmental effects and cycle counting of data. **(12.5%)**

6. Assessment codes – BS 7910, API 579 - and other approaches (e.g., CorLAS, PAFFC, LEFM). Use of commercial ECA software packages for routine analyses. **(12.5%)**

7. Assessment of environmental cracking. **(12.5%)**

8. Can interpret pipeline data such as design and service records, pipe stress analysis output, SCADA data, and derive inputs for fracture and fatigue analyses. **(15%)**

RECOMMENDED LEARNING

Individuals need some technical knowledge before commencing this certification program, particularly if an individual is new to, or inexperienced in, pipeline integrity. Each certification scheme contains a list of recommended awareness level competencies (knowledge and skills) which cover basic terminologies, principles, and practices in pipeline integrity competencies.

This list of awareness level competencies can assist in understanding the foundation level competency prior to assessment. These competencies are only a recommendation but are **NOT** required.

CS_020A: Pipeline Defect Assessment
Knowledge of

1. Material properties (strength, ductility, hardness, and toughness).
2. Fracture mechanics: history, key parameters, methods, and published good practices.
3. Stress analysis (internal pressure and external loading).
4. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
5. Types of failure (including ductile, brittle, overload, and fatigue).
6. Case studies in major pipeline failures.
7. Corrosion assessment, crack assessment, mechanical damage assessment.
8. Crack management in pipelines.

CS_030A: Stress Analysis
Knowledge of

1. Loads, forces, moments.
2. Pressure, stress.
3. Stresses in pipelines caused by internal pressure and external loadings.
4. Stress versus strain.
5. Mechanical properties (strength, deformation, fracture).

6. Stressing guidelines in pipeline standards, including allowable stresses and design factors.
7. Effect of subsea environment, and stresses in risers.
8. Effect of ground movement on pipelines.

CS032A: Fracture Mechanics
Knowledge of
1. History of fracture mechanics. Material properties, including ductile and brittle fracture, and transition curves. Strength, toughness, and ductility.
2. Structural mechanics, stress, strain, strength. Effect of notches and cracks on structures.
3. Linear elastic fracture mechanics, and the stress intensity factor.
4. Fatigue predictions using S-N curves and fracture mechanics crack growth.
5. Effects of environment on fracture and fatigue.

CS033A: Failure Analysis
Knowledge of
1. Material properties (strength, ductility, hardness, and toughness).
2. The ductile to brittle transition of steel.
3. Pipeline failure causes (with a focus on external interference, corrosion, materials defects, fatigue, ground movement, theft).
4. Modes (e.g., buckling) and mechanisms of failure (including corroison, and fatigue).
5. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion).
6. Chain of custody.
7. Human factors in failures (e.g., CSA's EXP248-2015.)
8. Failure site investigations and protecting evidence.

9. Site safety following a failure.

CS042A: Failure Modes and Mechanisms
Knowledge of
1. Why failures occur.
2. Loading types (tension, torsion, compression, etc.)
3. Brittle and ductile failures.
4. Failure modes (collapse, buckling), and failure modes from pressure loading (leak, etc.).
5. Failure mechanisms (including corrosion and fatigue)
6. Modes of failure (including ductile, brittle, overload, and fatigue).
7. Failure mechanisms and their causes (including cracking, corrosion growth, and erosion), modes, and final failure.

CS048: Pipeline Defects
Knowledge of
1. Line pipe welds (longitudinal, and spiral), welding processes, inspection methods, and defects (e.g. lack of fusion, laminations, hook cracks, porosity).
2. Pipeline welds (circumferential): standards, inspection methods, and defects (including geometric defects such as misalignment).
3. Common pipeline construction related defects (e.g., misalignment) and their causes.
4. Common types of internal and external corrosion (e.g., pitting, general) and their causes.
5. In-service defects (e.g., mechanical damage, stress corrosion cracking and fatigue cracking).

CERTIFIED PIPELINE INTEGRITY ENGINEER

Individuals who achieve the Certified Pipeline Integrity Engineer status have demonstrated the experience, knowledge and skills (competencies) to identify and give reasoned conclusions and recommendations on pipeline integrity issues.

The program was designed for professional engineers; i.e., an individual who has an engineering degree from a recognized or accredited university, or who has a professional engineering qualification (for example, PEng. or CEng).

ELIGIBILITY REQUIREMENTS

MEMBERSHIP REQUIREMENT

CERTIVATION GmbH does not require membership in any other organization. Certification is open to all qualified candidates.

EDUCATION

With a higher education degree:
Bachelor's degree or international equivalent from an accredited institution of higher education in engineering Acceptable evidence requires a photocopy of transcripts or diploma certificates for any degrees earned.
Or
Professional engineering qualification
Acceptable evidence requires a photocopy of professional certifications acquired.

CERTIFICATIONS

Individuals who wish to pursue the Pipeline Integrity Engineer certification have demonstrated their knowledge in the eight-(8) individual certifications.

- Certified in Pipeline Engineering Principles: CS_001F
- Certified in Pipeline Inspection and Surveillance: CS_005F
- Certified in Pipeline Integrity Management: CS_014F

- Certified in Pipeline Defect Assessment: CS_020F
- Certified in In-Line Inspection Technologies & Procedures: CS_022F
- Certified in In-Line Inspection Data Analysis & Reporting: CS_026F
- Certified in Stress Analysis: CS_030F
- Certified in Fracture Mechanics: CS_032.

BODY OF KNOWLEDGE

To be awarded the Certified Pipeline Integrity Engineer, a candidate must pass a comprehensive examination consisting of approximately 100 multiple-choice questions. Knowledge in eight major areas (domains) is tested.

The importance of each domain, and the tasks, knowledge, and skills within it, determine the specifications of the Certified Pipeline Integrity Engineer examination. The relative order of importance of the domains determines the percentage of the total exam questions.

Please note that questions from the various content areas will be mixed throughout the examination. The questions will **NOT** be presented in content area order on the examination.

All questions **are only offered in English**. The exam duration is two and a half-(2.5) hours.

DOMAIN ONE

Pipeline Engineering Principles (15%)
Knowledge of
1. Pipeline economics and pipeline safety statistics. (1%)
2. Pipeline standards, including their bases and development, linkage to Regulations, key content, purposes, location classification, high consequence areas, design factors, and inherent safety. (2%)
3. Line pipe manufacture, types, standards, and choice of coatings. (1%)

4. Fluid flow, fluid phases. (1%)
5. Material properties including strength, ductility, toughness, weldability, and metal fatigue. (2%)
6. Practical aspects of pipeline routing, and the pipeline construction process. (1%)
7. Pipeline operation, including control rooms, control systems, and leak detection. (2%)
8. Calculation of stresses on pipelines, including principal stresses, thermal stresses, and equivalent stresses. (2%)
9. Practical aspects of pipeline integrity management, including risk assessment and management, pressure testing, in-line inspection, and pipeline repair. (2%)

DOMAIN TWO

Pipeline Inspection and Surveillance (12%)
Knowledge of
1. Project plan and cost budget for standard projects involving inspection and surveillance activities. (1%)
2. Able to recognize the different requirements and available solutions for different project applications (e.g. offshore vs. onshore / buried vs. above ground). (2%)
3. Able to select or specify appropriate inspection and surveillance techniques and services for different project applications. (2%)
4. Interpretation of inspection and surveillance activity findings, assessing their significance, and identify shortcomings. (2%)
5. Pipeline threats and solutions. (2%)
6. Future inspection and surveillance methods. (2%)
7. On-line monitoring of threats. (1%)

DOMAIN THREE

Pipeline Integrity Management (20%)
Knowledge of
1. Different approaches to pipeline integrity management. (2%)
2. Standards' requirements (including ASME B31.8S, API 1160, API 1173, CSA Z662, DNV RP F116, BSI 8010-4, EN 16348). (2%)

3. Interpreting inspection and survey reports, and inspection, testing, maintenance, and surveillance options (all methods). (2%)
4. Risk reduction options, preventive measures and mitigations. (2%)
5. Establishing baseline inspection and testing intervals. (2%)
6. Defect assessment, including fatigue assessment. (2%)
7. Pipeline repair and rehabilitation, and repair program design. (2%)
8. Threats to pipeline integrity and the consequences of pipeline failure. (2%)
9. Critical data, missing data, treatment of uncertainty. (2%)
10. Emergency preparedness, emergency response, site investigation (2%)

DOMAIN FOUR

Pipeline Defect Assessment (15%)
Knowledge of
1. Material properties (with a detailed focus on fracture toughness). (2%)
2. Fracture mechanisms (brittle, transitional, ductile), and fracture mechanics approaches (including J integral and crack tip opening displacement). (2%)
3. Assessment of corrosion using ASME B31G, assessment of cracks using API (2%)
4. 579/BS 7910, and assessment of mechanical damage. (2%)
5. Pipeline failure causes (including external interference, external forces, corrosion, fatigue, ground movement, sabotage, theft, human error (including over-pressure, over-temperature), spanning, hydrodynamic loads, buckling, and thermal stressing). (2%)
6. Effect of hydrotesting on defect behavior.
7. Commercial, corporate, political, and sabotage threats to pipelines and facilities. (1%)
8. Case studies in pipeline failures, modes, and mechanisms. (2%)
9. Corrosion growth and fatigue crack growth models. (2%)

DOMAIN FIVE

In-Line Inspection Technologies & Procedures (11%)
Knowledge of
1. Knowledge of different pipeline types used to convey hydrocarbon products (e.g., production, export, transmission and distribution), their key features, and general operating characteristics that affect pigging and in-line inspection. (1%)
2. Knowledge of different line pipe types, pipeline construction concepts (e.g., launcher/receivers, and other related facilities). (1%)
3. Familiarity with different ILI tools/technologies and their relative strengths and weaknesses. (2%)
4. Knowledge of the service providers, the major suppliers, and their individual capabilities. (1%)
5. Major pipeline threats and the associated damage mechanisms. (2%)
6. Major project phases required to execute a successful ILI campaign. (1%)
7. Familiarity with standard ILI data analysis methodology. (1%)
8. Industry standards pertaining to ILI pigging. (2%)

DOMAIN SIX

ILI Data Analysis and Reporting (8%)
Knowledge of
1. Pipe materials (steel grades, design parameters, etc.) and pipeline components (weld types, installation, etc.). (1%)
2. Pipeline anomaly categories (geometrical, volumetric, planar). 1%)
3. ILI technologies, theoretical base of the underlying NDE principles, and their performance specification. 1%)
4. Pipeline tracking and assessment of AGM marker. 1%)
5. Correlation of different ILI runs by girth weld list comparison. 1%)
6. Correlation of inspection pipe tally to pipeline data. 1%)
7. Assessment of ILI data quantity (data loss) and quality (e.g., signal strength). 1%)

8. Interpretation and classification of pipeline anomalies and components, as well as indications of their origin (dirt, debris, objects, noise, etc.). 1%)
9. Sizing of anomaly dimensions (depth, length, width, etc.). 1%)
10. Anomaly interaction rules and failure pressure assessment standards. 1%)
11. Compilation of standard ILI reports with statistical charts and tables. 1%)
12. Cataloging field verification results and comparison to ILI results. 1%)

DOMAIN SEVEN

Stress Analysis (8%)
Knowledge of
1. Principal stresses, equivalent stresses, thermal stress, residual stresses (primary and secondary stresses). (1%)
2. Pipeline stress analysis methods and software (elastic). (1%)
3. Derivation of pipeline stresses from first principles. (1%)
4. True stress-strain. (1%)
5. Design for fatigue. (1%)
6. Stress analysis using pipeline standards, and pipeline standards' methods, and their bases. (1%)
7. Wall thickness calculations. (1%)
8. Soil-pipe interactions, effect of sea bed conditions. (1%)

DOMAIN EIGHT

Fracture Mechanics (7%)

Knowledge of

1. Quantitative and qualitative toughness and interpreting fracture toughness (Kmat) from Charpy and toughness data, using standard correlations. Fracture toughness testing. (1%)
2. Identify primary and secondary stresses, toughness, and other inputs to a fracture analysis. (1%)
3. Stress fields at crack tips, and elastic-plastic fracture using K, J, or CTOD. Relationship between K, J and CTOD. (1%)
4. FADs for fracture and collapse. Choice of FAD, inclusion of residual stress, effects of pressure testing and PWHT on inputs. (0%)
5. Can carry out fatigue analyses by S-N or fracture mechanics methods, including environmental effects and cycle counting of data. (1%)
6. Assessment codes – BS 7910, API 579 - and other approaches (e.g., CorLAS, PAFFC, LEFM). Use of commercial ECA software packages for routine analyses. (1%)
7. Assessment of environmental cracking. (1%)
8. Can interpret pipeline data such as design and service records, pipe stress analysis output, SCADA data, and derive inputs for fracture and fatigue analyses. (1%)

APPLYING FOR EXAMS

Certification Application

The certification application is available online to download from the www.CERTIVATION.com website.

The application for the Pipeline Integrity: CS_001F certification contains eight sections.
- Section 1: Applicant Information
- Section 2: Special Testing Accommodations
- Section 3: Certificate and Certificant Registry
- Section 4: Evidence of Eligibility
- Section 5: Refund Policy
- Section 6: Code of Conduct
- Section 7: Candidate Agreement and Statement of Acknowledgment
- Section 8: Payment Information

Applications must be filled out in its entirety and must include either a physical or electronic signature (see **Signature / E-Signature Policy**)

Submit completed applications with eligibility evidence to application@CERTIVATION .com.

Applications will not be reviewed without payment.

Section 1: Applicant Information

The contact information you provide will be used for all correspondence with the email address the main form of communication. The address may be either your personal address or business address. Your certificate will be mailed to this address.

If any of your contact information, e.g. name, mailing address, email address, and/or telephone number entered on application changes during the application process, applicants must send an email to application@CERTIVATION.com within 7 days of the change of information.

In addition, applicants must notify the CERTIVATION GmbH in case of a legal name change. Your legal name must match the name on the government-issued photo identification you will be presenting to the proctor in order to be admitted take the certification examination.

Section 2: Special Testing Accommodations

You must indicate on their application if they are planning on applying for a testing accommodation.

Section 3: Certificate and Certificant Registry

You must enter their name exactly how they wish it to appear on their certificate. This does not have to match their government issued ID.

You must opt in or opt out of the certificate registry.

Section 4: Evidence of Eligibility

You must acknowledge they understand that their application will NOT be approved until all required documentation is submitted.

Section 5: Refund Policy

Applicants must acknowledge they have read and understand the refund policy. If you have any questions, please contact CERTIVATION GmbH application@CERTIVATION.com

Section 6: Code of Conduct

Applicants are required to sign agreeing to abide by the Code of Conduct.

A Code of Conduct establishes the basic ethical standards for the professional behavior of certificants. Although a Code of Conduct cannot include rules for every imaginable situation, it is designed to provide both appropriate ethical practice guidelines and enforceable standards.

As a condition of earning and maintaining certification, applicants for the Pipeline Integrity Engineer Certification scheme must agree to uphold and abide by the prescribed Code of Conduct.
1   Exercise a reasonable industry standard of care in the performance of professional duties.
2   Respect human rights

3   Hold paramount the health and safety of the public in the performance of professional duties.

4   Work in a manner consistent with all applicable laws and regulations; demonstrate integrity, honesty, and fairness in all activities; and strive for excellence in all matters of ethical conduct.

5   Act with integrity in any relationship that involves an employer or client and disclose fully to an affected employer or client any conflicts-of-interest resulting from business affiliations or personal interests.

6   Accept responsibility for maintaining the credential through recertification and continuously uphold the Code of Conduct.

7   Voluntarily and immediately report any felony convictions or other legal dispositions that would constitute violations of this Code of Conduct that have not already been disclosed, regardless of when they occurred, and report any conditions that prohibit fulfillment of duties as set forth in the competence requirements.

Section 7: Candidate Agreement & Statement of Acknowledgement

You must acknowledge and agrees to the provisions stated in the Candidate Agreement and Statement of Acknowledgment as follows:

1.   the competence assessment and all related materials sent to the applicant/candidate are copyrighted and strictly confidential, and shall not be shared with any third party;

2.   the applicant / candidate has seen and understands the relevant Competence Standard(s), contents, requirements, and criteria, and believes he/she meets these;

3.   the applicant / candidate agrees to notify the CERTIVATION in a timely manner of changes concerning the information they have provided, including my current address and telephone number;

4.   the applicant / candidate agrees to notify CERTIVATION without delay, of any matter that affects the individual's ability to continue to fulfil the Personnel Certification requirements once Personnel Certification is granted;

5.   the applicant/candidate accepts and agrees with the assessment and its criterion (subject to item 10);

6.   the applicant/candidate will act in a truthful and honest manner at all times and declares that all information and documentation he/she submits is correct and an honest record of his/her education, qualifications and experience;

7.   the applicant/candidate will not participate in fraudulent test taking practices;

8.   the applicant/candidate will submit all required information and documentation prior to any award or certification, and that all materials submitted become the property of CERTIVATION GmbH, and are not required to return the materials;

9.   information related to the participation in this assessment may be used in an anonymous manner for research purposes only;

10. the applicant/candidate is aware of the grievance and appeal process, and will accept the final outcome of such process;

11. the applicant/candidate will comply with all applicable provisions of this assessment and any resulting certification scheme;

12. the applicant/candidate will immediately cease the use of all claims to the assessment or certification that contain any reference to the Assessment, CERTIVATION GmbH or any award by such CERTIVATION GmbH upon suspension or withdrawal of such certification, and to return all certificates issued by the CERTIVATION GmbH ;

13. the applicant/candidate will only make claims regarding this assessment only with respect to the scope for which the certification has been granted;

14. the applicant/candidate hereby releases, discharges and indemnifies CERTIVATION GmbH, QPPI Certification Board, ROSEN Swiss AG, all related ROSEN entities, its directors, officers, members, examiners, employees, attorneys, representatives and agents from any actions, suits, damages, claims or obligations arising out of or in connection with this application and the awarded competency or qualification. The applicant/candidate further agrees and understands that all decisions regarding competency or qualification award rest solely in the discretion of Body;

15. the applicant/candidate agrees not to use the use the certification in such a manner as to bring the certification body into disrepute, and not to make any statement regarding the certification which the certification board considers misleading or unauthorized;

16. the applicant/candidate agrees not to use the certificate in a misleading manner;

17. Information about applicants / candidates / certificants and their application status and examination results are considered confidential. Personal information submitted by the applicants / candidates / certificants with an application is considered confidential. Confidential information will not be released unless a signed release is provided or is required by law. When required by law, the applicants / candidates / certificants will be notify to the extent permitted by law.

Section 8: Payment Information

Contains instructions on how to make a payment.

APPLYING FOR THE EXAMS

Application Submittal

Upon submittal of their application, applicants will be notified by email.

Applications and submitted documentation will go through two reviews: an initial review and a verification review. The initial review confirms the completeness of the application and receipt of all required eligibility documentation.

Applicants are notified within seven-(7) business days if their application is (1) complete and moving to verification review process. Applicants whose application is incomplete and/or any of the required documentation is missing, will be notified by email. The email will include the list of discrepancies and inform the applicant that they have **thirty-(30) days** to correct the discrepancies.

Failure to correct these discrepancies within the allotted time period will forfeit their application fee and be required to start the application process again which includes paying another application fee.

APPLICATION FEE

The application fee is the **non-refundable**. This fee pays for the processing, review, and data management for each certification application. This is paid when the application is submitted.

◆ Individual Competency Certification Application Fee: **$150 [USD]**
◆ Pipeline Integrity Engineer Certification Application Fee: **$ 0**

The application fee must be paid every time an applicant applies to any of the certifications available except for applicants applying for the Certified Pipeline Integrity Engineer certification.

Applicants, whose applications is incomplete and not corrected within thirty-(30) days of notification shall forfeit their application fee and shall be required to repay the application once if they restart the application process.

FEES & REFUND POLICY

• CERTIVATION reserves the right to assess fees for all services connected to the Pipeline Integrity Certification program. This includes applications, examinations, recertification, and duplicate certificates.

• Fees are subject to change and it is the applicant / candidate's responsibility to submit the current fee for any aspect of the certification. All fees shall be published in the candidate's handbook.

• Application fees are non-refundable; candidates are encouraged to review the eligibility requirements prior to applying.

• Applicants whose applications are incomplete and fail to correct any and all discrepancies within thirty-(30) days of notification, forfeits their application fee.

- Candidates arriving thirty-(30) minutes after the scheduled start exam time will be considered absent and will forfeit their exam fee.
- Candidates who are a no show, forfeits their exam fee.
- Candidates who fail to take their exam within the one-(1) year timeframe, which begins at the time of payment for the exam, forfeits all fees paid.
- Refunds are not granted to candidates who forfeit or fail the examination; this includes candidates who cannot produce the required identification for exam admittance. Under these circumstances candidates will be considered absent, will forfeit the full examination fee, and will be required to repay the examination fee.
- Refunds and partial refunds for examination fees are granted at the discretion of the Certification Manager for extenuating circumstances only

VERIFICATION OF APPLICANT ELIGIBILITY POLICY

CERTIVATION GmbH reserves the right to verify any and/or all information submitted with an application attested to by the applicant through phone interviews and authentication of transcripts or training certificates. Additionally, the CERTIVATION GmbH reserves the right to request further information or documentation from the applicant as needed.

NON-DISCRIMINATION POLICY

CERTIVATION GmbH prohibits discrimination against its applicants, candidates, certified persons and employees on the bases of race, color, national origin, age, disability, sex, gender identity, religion, and where applicable, political beliefs, marital status, or sexual orientation

STATEMENT OF IMPARTIALITY

CERTIVATION GmbH is committed to acting impartially in relation to its applicants, candidates, and certified persons. Certification decisions shall be made in accordance with policies and procedures. Policies and procedures affecting applicants, candidates, and certified persons shall be made public and shall fairly and accurately convey information about the certification program. CERTIVATION GmbH understands the threats to impartiality that include, but are not limited to, self-interest, activities from related bodies, and relationships of personnel, financial interests, favoritism, conflict of interest, familiarity, and intimidation. In upholding its commitment to maintain the highest level of impartiality and objectivity in its practices and decision- making,

CONFIDENTIALITY POLICY

CERTIVATION GmbH is committed to protecting confidential and/or proprietary information related to applicants, candidates, certificants and the examination development, maintenance, and administration process. The confidentiality policy applies to all CERTIVATION GmbH personnel, the QPPI Certification Board and committee members, contractors, and other individuals who are permitted have access to confidential information.

Confidential information includes but is not limited to:
- Applicant and candidates records
- Examination development documentation (including JTA reports, technical reports, exam questions, answer keys, examination scores, etc.
- Disciplinary investigations and/ or actions

CERTIVATION GmbH personnel, the QPPI Certification Board and committee members shall keep confidential all applicants', candidates', and certified persons' information (including name, address, telephone numbers, and other confidential records) unless authorized for release by the applicant, candidate, or certified person.

CERTIVATION GmbH will only release confidential information when required by law and will notified the candidate/certificants to the extent, which is permitted by law.

SIGNATURE / E-SIGNATURE POLICY

CERTIVATION GmbH requires that the candidate fulfill the signature requirements of the e-signature/signatures according to the Pipeline Integrity Engineer Certification Program certification process.

CERTIVATION GmbH abides by the international standards of security procedures for e-signatures/ signatures as well as other regional identification practices.

Individuals who falsify e-signatures/signatures may subjected to disciplinary action, cancellation of certification, and legal actions.

APPEALING A DECLINED APPLICATION

Applicants, who submitted a completed application and notified that they do not meet the eligibility requirements, may appeal this decision. The denial of eligibility notification will contain the reason(s) why they do not meet the eligibility requirements.

APPEALS POLICY

CERTIVATION GmbH is committed to a fair, impartial and timely appeals process. In fulfilling this commitment, no appeal is reviewed by the personnel involved in the adverse certification decisions.

Quality Management of CERTIVIATION GmbH is responsible for conducting a constructive, impartial review and to deliver a timely decision.
Adverse certification decisions include denial of eligibility for initial certification, denial of recertification, suspension of certification or revocation of certification, accusations of exam irregularities and/or special testing accommodations denial.

An individual wishing to appeal an adverse decision must submit the appeals form and any additional required documentation within **fourteen (14) calendar days** from the date of the denial.

Information submitted during the appeals process is considered confidential and shall be handled in accordance with the CERTIVATION GmbH's confidentiality policy.

Acknowledgement of receipt of the appeal is sent to the Appellant by email that confirms receipt of delivery within five-(5) days.

During the review process, additional documentation from the appellant may be requested.

Appellants are notified of the decision render within twenty-one (21) days from the appeal's submittal date. The decision of rendered shall be final. The maximum number of appeals is one per adverse decision.

The appeal policy, process and form is available to the public without request via the CERTIVATION GmbH website. APPEALS

TESTING ACCOMMODATIONS

The purpose of test accommodations is to provide all candidates with full access to the test. However, test accommodations are not a guarantee of improved performance or test completion. CERTIVATION GmbH will provide reasonable and appropriate test accommodations to individuals with documented disabilities who demonstrate a need for test accommodations. Test accommodations may include things such as:

- Extra testing time
- Reader
- Scribe

Test accommodations are individualized and considered on a case-by-case basis. Consequently, no single type of test accommodation (e.g. extra time) would necessarily be appropriate for all individuals with disabilities. Simply demonstrating that an individual meets diagnostic criteria for a particular disorder does not mean that the person is automatically entitled to test accommodations.

SPECIAL TESTING ACCOMMODATIONS POLICY

CERTIVATION complies with the Americans with Disabilities Act (ADA) of 1990, including changes made by the ADA Amendments Act of 2008 (ADAAA) and related regulations. To ensure equal opportunity for all qualified persons, CERTIVATION will make reasonable accommodations for applicants with disabilities. Applicants are responsible for any costs incurred in obtaining the required diagnosis and recommendation. The purpose of test accommodations is to provide all candidates with full access to the test. However, test accommodations are not a guarantee of improved performance or test completion. CERTIVATION and the QPPI Certification Board will provide reasonable and appropriate test accommodations to individuals

with documented disabilities who demonstrate a need for test accommodations.

Test accommodations are individualized and considered on a case-by-case basis. Consequently, no single type of test accommodation (e.g. extra time) would necessarily be appropriate for all individuals with disabilities. Simply demonstrating that an individual meets diagnostic criteria for a particular disorder does not mean that the person is automatically entitled to test accommodations.

Applicants who wish to do so must (1) indicate on their application they are applying for special testing accommodations and (2) submit the completed Special Testing Accommodation Request form with the required documentation.

A licensed professional, i.e. physician, psychologist, psychiatrist must complete the Professional Evaluation section. The documentation requires a clear explanation of the current functional limitation and a rationale for the requested accommodations.

Certificants, who received testing accommodations on previous certification exams, will receive the same accommodation previously provided. However if additional testing accommodations are required, certificants must follow the requirements for requesting testing accommodations as First-Time Applicants.

Applying for Special Testing Accommodations

Applicants requesting accommodations may do so by:
1. Indication on their application if they will be requesting special testing accommodations
2. Submit the completed Special Testing Accommodation application.

3. Save the document in a PDF format using the following naming format: Last_First_TA.pdf
4. Email the signed application to: application@CERTIVATION.com.

Applicants are notified within 7 days if their application is either complete and in the review process or incomplete. The review process is typically 14 business days, however if additional information is required, the process could take longer.   The application review will have one of the following outcomes:

- The accommodation is provided as requested.
- The request for accommodations is denied.

Applicants, whose request for special testing accommodations has been approved, are notified of the decision by email and advised to pay the exam fee. The certification office will notify the testing center of the approved accommodations after the exam fee payment has been processed.

Accommodation Denials

Applicants, whose special testing accommodations were denied are notified by email and advised they have the right to appeal the decision.

Applicants, who do not wish to appeal the decision and would like to take the exam without any special testing accommodations must send notification in writing to application@CERTIVATION.com.

In the event that a test accommodation is denied in part or in full, candidates have the right to appeal the decision.

Candidates must submit the appeal form with a statement from the professional who has diagnosed the disability about why the denial would have negative impact on the applicant's ability to perform successfully on the examination.

The documentation must:
- Be printed on the professional's letterhead

- Be signed and dated by the professional who diagnosed the condition.

TAKING EXAMS REMOTELY

CERTIVATION offers remotely proctored exams that you can take in the comfort of your home. At exam time, you are connected to a proctor over the internet, who will oversee your test. The connection will be via video, audio and remote screen share.

The proctor can see, hear and see the screen of your computer during the entire time, and everything is recorded and, if required, can be reviewed later.

DUE TO FIREWALL SECURITIES, IT IS HIGHLY RECOMMENDED THAT YOU DO NOT TAKE A REMOTELY PROCTORED EXAM ON YOUR COMPANY COMPUTER.

COMPUTER REQUIREMENTS

- Laptop / computer with 4GB of available memory. The app will not work on phones, chrome books or iPads/tablets. TestReach cannot guarantee service on a Surface-Pro unless it is running a full version of Windows 10.
- A Windows v7.0+ or Mac10.10+ operating system, and MacOS BigSur users need to upgrade to 11.3+.Intel Core i3 (or equivalent) and 4GB RAM
- Intel Core i3 (or equivalent).
- A working webcam that can be used to scan the room, microphone and speakers.
- Minimum candidate internet speed of 2 Mbps.
- Recommended screen size of at least 13" and a resolution of 1024 x 768. **tablets,**

EXAM ADMINISTRATION

The purpose of examinations is to confirm that individuals can perform the duties and responsibilities to an adequate degree of competence. All exams are developed partnership with a psychometric consultant in keeping with generally accepted psychometric and educational testing principles.

EXAM ADMINISTRATION POLICY

CERTIVATION GmbH is committed to ensuring the examination process is fair and valid for all candidates.
As such, they will provide the following:

• Procure examination administration services from an outsourced service provider who shall ensure

• that examinations are safeguarded and secure;

• Exams will be administered in a standardized manner using trained proctors, who are connected to the candidate by video, audio, remote screen share and instant messaging during the entire exam

• Candidates are provided with a standardized test administration experience that complies with all policies and procedures related to exam administration

• Review any candidate feedback concerning test administrations, including information about test site proctors and experience

EXAMINATION ADMINISTRATION RULES

1. No other person is allowed to enter the room while you are taking the proctored exam.
2. The lighting in the room must be bright enough to be considered "daylight" quality. Overhead lighting is preferred. If overhead lighting is not available, the source of light must not be behind you.
3. You must sit at a clean desk or table.
4. The desk or walls around you must not have any writing.
5. The room must be as quiet as possible. Sounds such as music or television are not permitted.

6. The following items must not be on your desk or used during your proctored exam, unless posted rules for the exam specifically permit these materials:
     Books, Paper, Pens, Calculators, Textbooks, Notebooks, Phones
7. You are not allowed to use headphones, ear buds, or any other type of listening equipment.
8. You must not communicate with any other person by any means.
9. You must not use a phone for any reason.
10. You are not allowed to leave the room during the exam for any reason.
11. Ensure that you do not block the webcam for any reason.
12. You may not move around during the examination period – i.e. no wandering around the room. You need to remain in the webcam viewing area at all times.

TAKING EXAMS REMOTELY

CERTIVATION offers remotely proctored exams that you can take in the comfort of your home. At exam time, you are connected to a proctor over the internet, who will oversee your test. The connection will be via video, audio and remote screen share.

The proctor can see, hear and see the screen of your computer during the entire time, and everything is recorded and, if required, can be reviewed later.

DUE TO FIREWALL SECURITIES, IT IS HIGHLY RECOMMENDED THAT YOU DO NOT TAKE A REMOTELY PROCTORED EXAM ON YOUR COMPANY COMPUTER.

COMPUTER REQUIREMENTS

• Laptop / computer with 4GB of available memory. The app will not work on phones, chrome books or iPads/tablets. TestReach cannot guarantee service on a Surface-Pro unless it is running a full version of Windows 10.

- A Windows v7.0+ or Mac10.10+ operating system, and MacOS BigSur users need to upgrade to 11.3+.Intel Core i3 (or equivalent) and 4GB RAM
- Intel Core i3 (or equivalent).
- A working webcam that can be used to scan the room, microphone and speakers.
- Minimum candidate internet speed of 2 Mbps.
- Recommended screen size of at least 13" and a resolution of 1024 x 768. **tablets,**

EXAMINATION REGISTRATION

Once you are approved to take the certification exam, you will receive official notification of your eligibility and advise you to pay the exam-sitting fee. You have **thirty-(30) days** after official notification to pay the exam-sitting fee.
After the exam-sitting fee has been received, you will receive an email from TestReach inviting you to create an account in their testing portal.

EXAM SITTING FEE

Examination Sitting Fees are the **non-refundable** fees paid to take the knowledge examinations.

Candidates **must** pay the exam-sitting fee within **thirty-(30) days** of acceptance into the program and must schedule their exam within the **one-(1) year** of paying the exam-sitting fee.

Failure to do so, the candidate shall forfeit all fees paid.

- ◆ Individual Competency Certification Exam Sitting Fee: **$350 [USD]**
- ◆ Pipeline Integrity Engineer Certification Exam Sitting Fee: **$500 [USD]**

SETTING UP YOUR TESTREACH ACCOUNT

Once you have paid your exam-sitting fee, you will be registered for the exam and notified of the registration through an email from TestReach.

The email will contain a user name, password and any specific instructions for the exam, inviting you to login to the system.
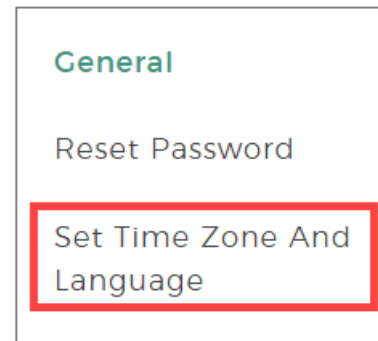
First, you click on the link provided in your email, which will open in a browser

Next, you enter your email address and the assigned password that you have received via email.

If it is your first time taking an exam on TestReach, you will need to download the TestReach application to your computer.

You will then be guided through a procedure to download and install the TestReach Candidate Application and carry out a short system check, which ensures your computer is all set for exam day.

It is very important that you set the correct time zone and time zone name to ensure your exam starts at the correct time.

REGISTERING FOR EXAM

The exam times available to you will be displayed on the screen and will be shown in the same time zone that your computer is set to.

The dates and times available are on a first come first serve basis. The maximum candidates per day is five-(5). The available dates are shown in sixty-(60) days calendar blocks.

However, you have one (1) year to schedule and take your exam from your official notification of eligibility.

Failure to take the exam within that year, you will forfeit all fees paid.

PRIOR TO THE EXAM

There is a three-step process for preparing for exam day. Candidates must confirm or book their exam three-(3) days in advance of exam day. Candidates who do not complete this process three-(3) days in advance will be considered a no-show and will not be able to sit their exam.

1. Download the TestReach application
2. Complete the system check
3. Confirm or book your exam

- Candidates will receive an email with login details from TestReach with the subject "TestReach New Account". If you cannot find this email, please check your spam folder.
- Please ensure that you have your user ID and password with you on the day of your exam.
- All candidates are advised to take "Test Tutorial", which guides you through taking an exam on TestReach. We suggest that you go through this tutorial by clicking "Enter" so that you can familiarize yourself with the exam canvas. You can use this tutorial Multiple times and your answers will not be recorded.
- All exams need to be booked or confirmed **3 days** in advance.
- Candidates are also advised to be in their login to their exam 20 to 30 minutes before their scheduled exam start time in order to login, enter exam and go through the system checks. 15 minutes before exam, the "connect" option will activate, and candidates can click on this to commence the pre- validation process.

Note: If you have, any difficulties with regard to logging on for your exam please contact:
+353 (1) 699 1385 / +44 (0)20 34758685 /
+1 (833) 202 2819
https://www.testreach.com/candidate-support.html
support@testreach.com

For information on the availability of TestReach services see
https://status.testreach.com

1. Before your exam please ensure that you have downloaded the TestReach application (as per your enrolment email)
2. Make sure you have completed the webcam check and confirmed your exam slot **at least 3 days in advance of exam day.** Candidates who do not complete this process 3 days in advance will be considered a no-show and will not be able to sit their exam.
3. Make sure that you have completed the Test Tutorial
4. You must ensure that you have your TestReach user information with you – user ID and password.
5. Do not forget your signed Photo ID – either passport or driving license only
6. You must not be interrupted throughout your exam. Please make sure your room / space is private and well lit.
7. You will be asked to scan the room for a 360° view using your monitor / webcam.
8. Ensure that your computer area is free of all clutter and unauthorized materials.
9. Your mobile phone should be turned off and put out of reach once you are connected with your supervisor.
10. Please do not have a second monitor on your desk or within reach.
11. You may not move around the test site – i.e. no wandering around the room. You need to remain in the webcam viewing area at all times.
12. No smart watches are allowed. You will be asked to show your wrists to the supervisor
13. There are **NO** Comfort Breaks allowed during this exam
14. Please behave in a suitable manner towards the Supervisor, comply with any procedural requests, and respond to all validation questions.

ON EXAM DAY

Login into TestReach using your User ID and Password.

It is advised that all candidates enter exam 15 minutes before start time in order to allow the candidate to go through pre - validation process with their Supervisor.

Note: Candidates will be permitted to commence the exam up to 30 minutes after the scheduled start time. The duration of their exam remains the same. If a candidate has not connected within 30 minutes, their exam will expire and they will not be able to do the exam.

Select "Connect to Supervisor". Please note that the connection to the Supervisor
- May **not** be immediate but that the Supervisor is aware that you are ready to start your exam.
- Once you are connected, Supervisor can immediately see: the candidate's desktop / screen, a 'chat box' for any Instant messages between the supervisor and candidate and a live audio/ video of the candidate via webcam.
- Supervisor will advise candidate of pre-validation process before they begin their exam via audio

VALIDATION PROTOCOL FOR CANDIDATES

There is a list of steps taken to verify a candidate's Identification and secondly that the testing area is secure.

a. The supervisor will ask you to show your photo ID to the camera. This ID should either be an in date passport or driving license, with photograph and signature.
b. The candidate will be asked to pan their monitor / camera around the room to get a 360° view – the supervisor will need to make sure that the candidate pans the whole area. This is to ensure that:
    - There is no second monitor / computer visible in the room

- Any phone visible has been put out of reach
- There are no notes / wall boards with information on them
c. The candidate will also be asked to scan their desk (including any shelves under the desk) – *this is to make sure that there are no phones, books, post-its etc. nearby.* **As there are no resources allowed for this exam other than water / drink the test area should be clear**.
d. If the supervisor observes any unauthorized items, they will request that the candidate removes them from the testing area.

SAMPLE INFRINGEMENTS GUIDELINES

Minor Infringements

A Minor Infringement is one that is deemed a low-level exception. Minor Infringements may not compromise
the test and can be rectified immediately however all minor infringements are logged.
- Leaning out of view of the camera.
- Blocking the computer camera.
- Commencing hand movements that could be interpreted as sign language.
- Glancing at other areas of the room that the supervisor cannot see (in this instance prior to raising an infringement the supervisor will query the candidate and ask the candidate to pan the room and in particular that area to check)
- Behaving in an unsuitable manner to the supervisor.

Major Infringements

A Major Infringement is one that is deemed a medium level exception. One that does not compromise the test and one that is rectified quite quickly with the candidate during the test.
- Accessing (or trying to access) another site / document when online
- Referring to any material – if there are no resources allowed.
- Not removing objects that are deemed interactive such as smart watches.

- Not agreeing or responding to the validation questions asked by the Proctor.

BLOCKER INFRINGEMENTS

A Blocker Infringement is one that is deemed a high-level exception. One that compromises the test and causes the test to be terminated. Supervisors will warn the candidates in advance.

- Leaving your computer for ANY reason.
- Communication of any sort with a third party discussing anything about the exam.
- Mobile phones are not to be used in the testing area at all once the exam has commenced.

The supervisor alerts the candidate that an action has been recorded. The supervisor will then log all the exceptional actions and inform the client via an actions log.

ACTIONS TAKEN IF AN INFRINGEMENT OCCURS

There is an actions log available to the supervisor, which will log any infringement made (including any notes written by the supervisor) and be timed and dated automatically.

If the supervisor notices any suspicious activity the supervisor will update the feedback log to indicate that an exception has occurred and detail the activity in question. A recording of the exam will also be taken to provide supporting evidence.

The exams administered for the pipeline integrity engineer certification program are intended to be delivered under standardized conditions. If the invigilator /proctor observe any irregularities during the exam, CERTIVATION GmbH will review the report and the video recording evidence to determine whether action is warranted. Testing irregularities include, but are not limited to:

1. Evidence of prohibited behavior on test day,
2. Evidence that a test taker may have falsified his or her identity,
3. Impersonation.

If CERTIVATION GmbH determines, in its sole discretion that the candidate has undertaken or participated in any action that compromises the

integrity and confidentiality of an exam or certification program, or an exam Irregularity has been identified in connection with the exam; CERTIVATION GmbH will determine which actions should be taken and all decisions are final.

Actions may include, but are not limited to:

1. dismiss that person on test day and void the person's answer document,
2. void or cancel the person's score;
3. may revoke any and all certifications you may have earned and ban you from earning future certifications or;
4. determine that the scores were not affected by the irregularity and take no action

APPEALING EXAM IRREGULARITIES DETERMINATION

Individuals, who have been denied certification due to a determination of exam irregularities or cheating, may appeal this decision. Additionally candidates may also request to view the video evidence. The request must be made in writing and noted in the comment box on the appeals form.

EXAM RESULTS

Candidates' results are will be made aware if they pass or fail the exam immediately following the online exam. However, the results will be considered provisional until the testing center has confirmed no suspicious activity took place during the examination.

Only after confirmation from the testing center will certification be awarded.

RETESTING

Candidates have three-(3) attempts to pass any of the Pipeline Integrity Exams, which includes the individual competency standard exams. Candidates who do not achieve a passing score on their first attempt must wait ninety-(90) days before retaking the exam. Candidates who do not achieve a passing

score on their second attempt, the candidate must wait one-(1) year from the date of their last attempt before retaking the exam.

Candidates requesting to retake an exam do so by:
1. Complete the 'Application for Retaking an examination' form in its entirety
2. Save the document in a PDF format using the following naming format: Last_First_RR.pdf
3. Email the signed application to: application@CERTIVATION.com.

Candidates are notified within 7 days if their application is approved. At that time, you will be advised to pay the retesting fee.

NOTE: Candidates, who received testing accommodations on previous certification exam(s), will receive the same accommodation previously

I PASSED THE EXAM, NOW WHAT?

Only individuals, who meet a combination of education, experience, training and mentoring requirements as well as demonstrated their knowledge by successfully passing a certification exam as well as to agreeing to abide by the provisions stated in the Candidate Agreement & Statement of Acknowledgment and Code of Conduct will be awarded certification.

At the end of the exam, candidates are notified immediately after submitting their exam computer-generated preliminary passed or failed score is issued. The results are considered provisional until the testing center has confirmed no suspicious activity took place during the examination. It is only after confirmation of no exam irregularities have taken place will the certification be awarded.

The certification office will notify candidates via email within five-(5) days following the exam of their award.

provided.   However   if   additional   testing accommodations are required, certificants must follow the requirements for requesting testing accommodations as First-Time Applicants.

Additionally, candidates who did not previously did not receive special testing accommodations can apply for accommodations during the application process

EXAMINATION RETESTING FEE

The examination retake fee must be paid for each attempt.
- ◆ Individual Competency Certification Retake Fee: $250 **[USD]**
- ◆ Pipeline Integrity Engineer Certification Retake Fee: $350 **[USD]**

CERTIFICATION REGISTRY

The Certification Registry is an online up-to-date record of individuals who have earned a certification and those who have chosen to keep it active. No personal contact information, such as email, physical address, or phone number, will be included in the registry.

Certificants can opt out of the having their name published in the online registry during the application process.   Stakeholders may contact us either in writing or by phone to verify if a certificants credentials are current. No other information will be provided.

No personal contact information, such as email, physical address, or phone number, will be included in the registry. Inclusion in the registry is voluntary. If you have an active certification and choose not to

be listed in the certification registry, your information will not be included. The certification registry will only include the following information:

- • Certification holder's first and last name
- • Country of residence
- • Certification Type
- • Certificate ID

CERTIVATION MARKS, LOGOS & CERTIFICATES

Usage of Marks, Logos & Certificates

CERTIVATION GmbH is the owner of the mark(s) and the certificate and provides individuals who have met the eligibility requirements and have successful passed the certification exam with a certificate suitable for framing and a digital seal. Certificants must comply with the following policy. The certificate holder must contact CERTIVATION GmbH in case of questions regarding the use of the certification mark in accordance with the rules.

Authorized Persons

Use of the Pipeline Integrity Engineer Certification Program marks and logos is limited to those persons who have been granted the certification by CERTIVATION GmbH and who satisfy all maintenance and recertification requirements established by the QPPI Certification Board. Use of the mark and logo by
individuals who have not been granted and maintained the certification is expressly prohibited.

Non-Assignability & Non-Transferable

Permission to use the certification mark is limited to the certified person, and shall not be transferred to, assigned to, or otherwise used by any other individual, organization, or entity.

Acceptable Usage

CERTIVATION GmbH permits the use of certification marks (certificate and seal/logo) exclusively in direct connection with the certified scope of application. It may be used on websites, information and advertising material. The certified organization is allowed to advertise with the following marks during the period of validity of the certification:

- Seal/logo;
- Certificate. The certificate may be used for external presentation as a PDF document.

Certification marks (certificate and seal/logo) of CERTIVATION GmbH may not be passed on to customers of the certified organization for use. The certificants may use the certification certificates issued by CERTIVATION GmbH only in their entirety and not in extracts or modified.

The certification mark may only be shown in the standard size and design. Standard size and design can be provided by CERTIVATION GmbH upon request. The size and colors of the certification mark may not be changed. The certification mark must always be shown in its entirety.

The user of the mark must comply with the requirements of CERTIVATION GmbH when referring to his certification status in communication media.

CERTIVATION GmbH requires its certificants not to make or permit misleading statements regarding its certification. This includes that the certified organization does not use or permit the use of the certification documents or parts thereof in a misleading manner.

The use of the mark is limited to the scope of the certification. This requires:
- Mention of the certification standard applied;
- The presentation in connection with the certified scope and avoid misleading reference to noncertified areas, activities, sites, products or services;
- The mention of the certification body.

The certification mark may not be used on test reports, calibration certificates or certificates. The marks may not be used on products or product packaging, nor may they be used in any other way that could be interpreted as marking product conformity. CERTIVATION GmbH requires all certificants not to use the CERTIVATION GmbH certification in a manner that brings CERTIVATION GmbH and/or the certification system into disrepute. The certificate holder must contact CERTIVATION GmbH in case of questions regarding the use of the certification mark in accordance with the rules.

All advertising materials must be modified accordingly if the scope or validity of the certification has been changed. In the event of suspension or withdrawal of certification, the instructions of CERTIVATION GmbH must be complied with and, if necessary (e.g. in the event of withdrawal or expiry), the use of all advertising material containing references to certification status must be terminated immediately.

CERTIVATION GmbH remains the owner of the mark(s) and the certificate.

Suspension or Revocation of Permission to Use Mark or Logo

The mark or logo may not be used in any manner that could bring the CERTIVATION GmbH into disrepute or in any way be considered misleading or unauthorized. The mark or logo may not be used in any manner that would imply an invalid connection between CERTIVATION GmbH and the certified person's business. This includes any use of the mark or logo that the public might construe as an endorsement, approval, or sponsorship by the CERTIVATION GmbH of a certified person's business or any product or service thereof.

The right to use the marks automatically expires when the validity of the certification expires. The right to use the mark also expires after suspension or withdrawal of certification. In such cases, the user of the mark may no longer use any existing documents, records, etc., bearing the marks from the date of expiry.

Actions by CERTIVATION GmbH to suspend or revoke use of the certification mark shall be communicated in writing to the person whose privileges are being suspended or revoked and to all other persons affected by the decision. CERTIVATION GmbH may also publicize its actions on its website and any other of its publications. Should any person continue use of CERTIVATION GmbH's mark or logo after notice of suspension or revocation, CERTIVATION GmbH shall seek full

equitable and/or legal remedies through a court of competent jurisdiction.

Amendments to the Regulation on the Use of Signs

CERTIVATION GmbH shall inform the user of the mark without delay of any changes to the regulations governing the use of the mark.

RECERTIFICATION

RECERTIFICATION POLICY

Recertification is an essential part of an accredited certification process. Standards, technologies, methodologies, and regulations change with time, and the recertification requirement is designed to ensure certificants are keeping up to date with those changes. Recertification demonstrates a commitment to maintain competency.

The Pipeline Integrity Engineer Certification and certification in individual competencies are valid for five-(5) years from date of issue. Recertification requires certified person to sit for and pass the certification examination again.

APPLYING FOR RECERTIFICATION

Candidates requesting to retake an exam do so by:
1. Download the recertification application from the www.CERTIVATION.com website.
2. Complete the 'Recertification Application form in its entirety
3. Save the document in a PDF format using the following naming format: Last_First_RA.pdf
4. Email the signed application to: application@CERTIVATION.com.
5. Pay the recertification fee.

Applicants are notified within 7 days if their application is approved. At that time, you will be advised to pay the exam fee.

Applications must be filled out in its entirety and must include either a physical or electronic signature. (see Signature / E-Signature Policy)

RECERTIFICATION FEES

In order to maintain active certification status, candidates must apply for renewal of certification to the Certification Committee every five (5) years.

- ◆ Individual Competency Certification Recertification Fee: **$350 [USD]**
- ◆ Pipeline Integrity Engineer Certification Recertification Fee: **$425 [USD]**

Special Testing Accommodations

Certificants, who received testing accommodations on previous certification exams, will receive the same accommodation previously provided. However if additional testing accommodations are required, certificants must follow the requirements for requesting testing accommodations as First-Time Applicants.

Additionally, certificants who did not previously did not receive special testing accommodations can apply for accommodations during the application process.

COMPLAINT POLICY

A complaint is a formal request for resolution of an issue related to CERTIVATION's certification activities or to a certified person's behaviors.

In order to maintain the credibility of the Pipeline Integrity Engineer Certification scheme, CERTIVATION GmbH has adopted procedures to allow individuals and/or entities to file complaints for but not limited to the following:

- Misuse or misrepresentation of certification(s);

- Unethical behavior of certificants, candidates or applicants to the Pipeline Integrity Engineer Certification program;
- The examination invigilators/ the testing center.
- CERTIVATION GmbH or related bodies

CERTIVIATION GmbH certification management is responsible for reviewing, determining the validity and rendering a decision for complaints against certificants. Quality Management of CERTIVIATION GmbH handles all other complaints.

All complaints must be submitted in writing using the complaint form completed in its entirety.

Information submitted during the complaint and investigation process is considered confidential and shall be handled in accordance with the CERTIVATION GmbH's confidentiality policy.

Individuals and/or entities who bring forth complaints are not entitled to any relief or damages by virtue of this process, although they shall receive notice of the actions taken.

The complaint form, policy and process is available to the public without request via the CERTIVATION GmbH website and in the candidate handbook.
The complaint process and complaint form can be found on the CERTIVATION Website.
COMPLAINTS

Misconduct & Disciplinary Actions Policy

CERTIVATION GmbH has the authority to suspend, reduce and/or withdrawal certification from certificants. Additionally CERTIVATION GmbH shall ensure any issues about certificants' practice and conduct are fairly and reasonably investigated and determined, and protect the public against unprofessional and unethical conduct by certified persons.

General causes for suspension or withdrawal include, but are not limited to fraud, deceit, failure to follow the policies and procedures of the Pipeline Integrity Certification program, including submission of inaccurate data to obtain and/or maintain certification.

Specific examples of violations that are grounds for certification suspension and withdrawal include:

- Falsifying information or misrepresentation
- on an initial or recertification Pipeline Integrity Engineer Certification program application.
- Releasing confidential examination materials or participate in fraudulent test-taking practices.
- Conviction of a felony under federal or state law.
- Misusing or misrepresenting the certification mark or logo.
- Violation of the Code of Conduct.
- Violation of established personnel certification policies, rules and requirements

Appealing Suspension or Revocation of Certification

Individuals whose certification has been suspended or withdrawn may appeal this decision. The reason(s) why you believe the suspense or withdrawal has been made in error need to be explained in detail on the appeals form.

IMPORTANT DEALINES

DESCRIPTION	DEADLINE
Change of contact information during application process	7 days
Application Discrepancies Correct any discrepancies or missing information	30 days
Exam-Sitting Fee Pay after official notification of approval	30 days
Schedule Exam From the day of exam-sitting fee payment	1 year
Appeal File any appeal after denial	14 days