

**Quali-SIL Reference Framework**  
**Qualification of Persons**  
**in Functional Safety**  
**in Accordance With the IEC 61511 Standard**

## Quali-SIL Reference Framework

# Qualification of Persons in Functional Safety in Accordance With the IEC 61511 Standard

### Version 02

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This reference framework has been approved by the Steering Committee on January 19, 2011.

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## FOREWORD

The IEC 61511 standard published in January 2003 entitled "Functional safety - Safety instrumented systems for the process industry sector", defines a method for analysing the safety level of an instrumented system. This standard is becoming the accepted reference standard for the integration and use of safety instrumented systems in the industrial sectors prone to significant risks such as the chemicals and energy sectors.

It incorporates two fundamental concepts: the safety life cycle and the safety integrity levels. It is based on the IEC 61508 standard which defines the functional safety concepts for designers and manufacturers of safety related systems and equipment. The IEC 61508 standard is becoming an accepted reference for safety development and qualification for manufacturers of equipment integrating electronics and software.

IEC 61511 is applicable to instrumentation equipment and systems that are either validated through use (experiential feedback reporting), or developed in conformity with the IEC 61508 standard.

The IEC 61511 standard defines safety requirements which are mainly reflected through the following :

- The safety policy must be identified by a safety management system and a clearly identified structure.
- The identification of hazards and assessment of risk.
- The activities necessary for achieving safety.
- Evaluation and audit / verification operations.
- Configuration management for various systems.
- Monitoring and follow-up relating to incident handling.

All of these requirements enable the control and maintenance of the safety instrumented system during all stages of its life (life cycle of the system).

INERIS offers manufacturers a programme focusing on the training and qualification of persons in compliance with IEC 61511 at the national and international levels.

INERIS establishes a structural framework that makes it possible to evaluate the competencies of different actors. It helps to verify that they have the skills and qualifications required to perform the activities for which they are responsible.

The qualification by INERIS leads to an individual certification of competence in functional safety in accordance with IEC 61511 and to the entitlement to use the Quali-SIL mark. This recognition helps to ensure that those persons involved in the different phases of the safety life cycle of an instrumented system possess the appropriate level of knowledge required.

**Disclaimer**

INERIS cannot be held liable for any accident caused by an error made by a person qualified in accordance with the Quali-SIL reference framework, in any phase of the safety lifecycle, from the design to the decommissioning of the system. The Quali-SIL qualification is limited to the attestation of the individual's knowledge and ability to implement the IEC 61511 standard.

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## Glossary

### Competency Certificate

INERIS grants a Competency Certificate to eligible applicants which serves to confirm their knowledge of the IEC 61511 standards and their ability to implement them.

### Qualification Awarding Body

INERIS serves as the Qualification Awarding Body. INERIS is responsible for the application and implementation of the reference framework, assessments and qualification decisions.

### Applicant

Applicant refers to a person who has duly made an application to INERIS requesting that it assess their skills and competence with a view to obtaining a Competency Certificate.

### Functional Safety

Part of the overall safety relating to electrical / electronic / programmable control systems associated with a complex system.

### (Safety) Lifecycle

Necessary activities involved in the implementation of a safety instrumented system occurring over the entire life period of the system – starting from the design stage until the end of life.

### Safety integrity

Average probability of a safety instrumented system satisfactorily performing the required safety instrumented functions under all the stated conditions within a stated period of time.

### Safety Integrity Level (SIL: Safety Integrity Level)

Discrete level (one out of four) for specifying the safety integrity requirements of the safety instrumented functions to be allocated to the safety instrumented systems. Safety integrity level 4 has the highest level of safety integrity; safety integrity level 1 has the lowest.

### Training Organisation

Organisation that provides training in functional safety based on the Quali-SIL reference framework and which is bound by an agreement with INERIS.

#### Applicable Documents

- [1] INERIS Code of Ethics
- [2] PR 0861 General certification rules and requirements
- [3] IEC 61511 Standard

#### QUALIFICATION REFERENCE FRAMEWORK

The Quali-SIL reference framework defines the specific rules and requirements relating to the qualification of the individual's ability to act or intervene on a safety instrumented system in conformity with the IEC 61511 standard.

This qualification results in the issuance of a Competency Certificate to the applicant [Appendix 1].

#### **ORGANISATION / ADMINISTRATION OF THE QUALIFICATION**

INERIS is responsible for the decisions relating to the qualification based on this reference framework. Decisions related to the granting, maintenance, upholding, extension, withdrawal or cancellation of the qualification are taken by the Director of Certification at INERIS.

#### **PURPOSE OF THE QUALIFICATION**

The process of qualification analyses the individual's ability to effectively intervene during one or more stages of the safety lifecycle of safety instrumented systems in compliance with the IEC 61511 standard.

The result of the qualification process is the basis for the issuance of a Competency Certificate.

The stated objectives include :

1. Recognition of the skills and competence of individuals.
2. Developing and enhancing the awareness of the company's personnel with regard to their role and involvement in the management of safety instrumented systems, particularly in the context of regulations relating to classified installations / facilities.
3. Harmonisation of training in functional safety.
4. The transfer of relevant knowledge to users necessary to ensure the proper use of equipment certified in accordance with the functional safety standards.
5. The ability to validate safety management systems related to instrumented systems as a whole (equipment, installation, operation, testing and repair, organisation / administration, etc).

## **QUALIFICATION AWARDING BODY**

The qualification is awarded by INERIS in its capacity as the Qualification Awarding Body. INERIS is responsible for the application and implementation of this reference framework and for any decisions taken in accordance with it. INERIS is responsible for the review and examination of qualification application case files.

### **ORGANISATION / ADMINISTRATION OF THE QUALIFICATION**

The organisation and functioning of INERIS are defined in the INERIS governing / status documents [1], [2].

INERIS authorises training providers based on their technical skills and competence and their organisational and operational capacity to provide training within training organisations / institutions.

INERIS is required to provide a report to the committee at least on an annual basis, regarding the Quali-SIL qualification activity.

INERIS is charged with providing secretariat services and ensuring the organisation of the committee. INERIS is responsible for publishing the list of qualified persons.

### **ROLE & RESPONSIBILITY OF INERIS**

INERIS ensures that the personnel involved in the training programmes have the required skills and competence and that they are in a position to maintain them.

### **STEERING COMMITTEE**

The Steering Committee is a structure created by INERIS in order to ensure the impartiality of the qualification process and to vouch for its proper functioning and operation. The composition of the committee respects a balanced representation of the different stakeholder groups, it is presided over by the Director of the Certification Branch of INERIS or by his Deputy.

The committee is composed of individuals who have the relevant knowledge and expertise in functional safety, representatives of the manufacturers or users of instrumented systems, training organisations / institutions, regulatory / supervisory bodies and representatives of INERIS involved in the qualification process.

The committee's role is :

- to approve the Qualification Reference Framework;
- to ensure the implementation and application of the reference framework;
- to validate new trainers / training providers;
- to deal with complaints from applicants;
- to ensure the development and evolution of the reference framework.

The committee shall be informed by INERIS as to the number of Competency Certificates issued.



### COMPOSITION

The members of the committee are legal entities or corporations, appointed for a term of 3 years which is renewable. A natural person or individual may only represent a legal entity or corporation.

### OPERATION

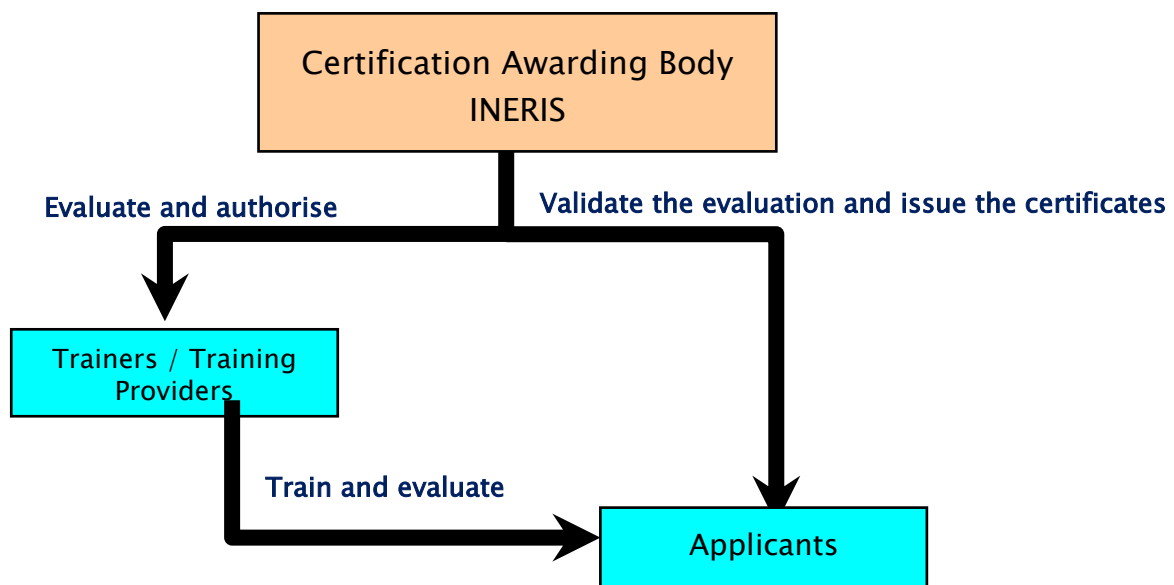
Committee meetings may be held only if at least half of the members are present. Decisions are taken by consensus or failing that by a majority vote of the members present and voting (one vote per organisation). In case of their unavailability or inability to be present during a committee meeting, the concerned organisation is entitled to exercise their vote by mail. All persons participating in the committee (incumbent - titular members, guest members, etc) are bound to maintain professional secrecy. The committee meets at least once per year upon being convened by INERIS.

### APPROVAL – REVIEW / REVISION

The committee is responsible for approving the Reference Framework. It may be reviewed and revised based on a recommendation or proposal from INERIS or a member of the committee and in all cases shall be subject to approval by the committee.

### PROCESS FOR OBTAINING THE QUALIFICATION

The process for obtaining the qualification is presented in the following figure.



## **QUALIFICATION OF TRAINERS**

The concerned persons are required to :

- complete the Quali-SIL Safety Engineer Training Module through a training organisation that is different from the one attended by the applicant,
- obtain a result of 85% correct responses at the very minimum,
- be audited by INERIS during a training programme,
- have conducted 5 training sessions in the field of industrial safety,
  - depend on a training organisation / institution,
  - provide documentary evidence of four years of experience in the field of functional safety (practical experience),
  - be validated by the steering committee (by a majority representing two thirds) and commit to contributing to the development of support materials and resources by participating in working groups and the promotion of Quali-SIL.

## **QUALIFICATION OF INDIVIDUALS**

### **Step 1 : Application for Qualification**

Any individual who has fulfilled the necessary pre-requisites may apply for a qualification of competence pursuant to the conditions in this Reference Framework. Such an individual shall be deemed to be eligible.

In order to obtain the qualification of competence, the person is required to have worked in the field in connection with one of the stages of the safety life cycle of safety instrumented systems.

An applicant seeking a certification level of "Functional Safety Engineer, Design Specialist and Risk Analysis Officer" - see § 4 – is required to submit :

- a curriculum vitae,
- copies of degrees / diplomas obtained,
- supporting documentary evidence of experience.

A reporting form for recording pre-requisites fulfilled by applicants is featured in Appendix 2. All applications must be evaluated by the training organisation / institution prior to the training.

An applicant seeking a certification level of "Installation and Maintenance Officer and Operations Officer" - see § 4 - is required to submit supporting documentary evidence of his / her experience relating to instrumented systems (confirmatory testimonial from the employer).

### **Step 2 : Training**

The training organisation / institution provides training and ensures the evaluation.

The training organisation / institution shall forward to INERIS the following items :

- The results of the evaluation, upon conclusion of the training,
- The record of attendance confirming the candidate's participation in the training program,
- The pre-requisite reporting form .

The training organisation / institution shall ensure the traceability of the training process.

The training programmes are open to candidates who may or may not be eligible. A minimum of 60% of the participants in a session should pass the Quali-SIL examination upon completion of the training.

### **Step 3 : Decision to Award the Qualification**

All of the materials are reviewed by INERIS in order to determine whether or not to award the competency certificate. A positive result is declared in the event of the assessment yielding 75% or more of correct responses and upon the prerequisites being validated.

In the case of a positive result, the competency certificate is issued to the applicant through the training organisation / institution. A sample template is presented in Appendix 1.

In the case of a negative result, INERIS informs the applicants that they may retake the exam.

### **Application of the Code of Ethics**

The INERIS Code of Ethics is applicable within the context of the qualification of competence. The Code entails impartiality, independence and the qualification requirement level for INERIS personnel involved in the Quali-SIL qualification process.

### **Rules Governing the Use of the Quali-SIL Logo**



For training organisation / institutions: The Quali-SIL logo must appear on documents describing the training programmes and courses and all materials used for the promotion of the qualification.

For applicants: Individuals who have achieved the competency certificate may use the Quali-SIL logo on professional documents (business cards, etc) over the validity period of the certificate.

### **ABUSIVE USES OF THE QUALIFICATION**

A Quali-SIL competency certificate may be withdrawn if :

- The certificate holder requests its withdrawal ;
- The certificate is used improperly / abusively or under poor conditions.

## **WITHDRAWAL OF THE QUALIFICATION**

The certificate withdrawal sanctions are effective upon receipt of the letter from INERIS, notifying the certificate holders of the decision and forwarded by registered mail with acknowledgment of receipt.

The concerned certificate holder affected by the withdrawal is required to cease and desist from citing or claiming qualification status and to take all necessary action to remove any mention of his / her qualification.

## **APPLICANT'S RESPONSIBILITY AND LIABILITY**

It is incumbent upon the applicant and their company to furthermore ensure they possess the specific skills and competence related to their field of activity. Accordingly, the certificate holder and their company shall remain liable for all accidents related to their activities.

## **CONFIDENTIALITY AND ANONYMITY**

The confidentiality of information collected by INERIS during the execution of its qualification activities is covered by the relevant general provisions in force at INERIS.

All persons involved in the qualification process are bound by professional secrecy requirements. Records and documentation compiled by the applicants and the evaluation reports are considered to be confidential.

## **MANAGEMENT OF THE QUALIFICATION PROCESS**

### **FILE / RECORD MANAGEMENT**

The qualification file consists of all of the documents leading to the qualification and mainly comprises of the following elements :

- The application for qualification,
- All documents submitted by the applicant (Eligibility Documents)
- Certificate of attendance / participation in the training programme,
- Results of the evaluation,
- The original of the competency certificate,
- Any other document that is deemed useful to retain.

### **RETENTION OF RECORDS**

All records relating to the qualification are archived in accordance with the general provisions in force at INERIS.

### **FORM AND USE OF THE COMPETENCY CERTIFICATE**

The competency certificate is issued in French and may also be provided in other languages based on the demand.

Any modification must be requested by submitting an application for extension or amendment of the competency certificate.

The competency certificate has a validity period of 5 years. It may be renewed after review by INERIS of the professional experience chalked up over the period considered. In the event the standard appears to have undergone significant change, on the advice of the committee, additional training may become necessary and shall lead to the assessment of the applicant.

### **Authorisation of Trainers**

The trainers shall be monitored and supervised by their organisations in order to evaluate their capacity to conduct training. A control audit of the training organisation / institution is carried out periodically by INERIS.

## TYPES OF TRAINING PROGRAMMES

### DOMAIN OF QUALIFICATION

The qualification is intended for those persons who are responsible for the execution of one or more of the tasks related to the safety life cycle of a safety instrumented system. This Reference Framework proposes a level of competence for each of the domains (A through E) corresponding to the various occupations / positions related to the safety life cycle of a safety instrumented system :

- A. Operations Officer SIS
- B. Design Specialist SIS (Part 2 of the Functional Safety Engineer qualification)
- C. Risk Analysis Officer SIS (Part 1 of the Functional Safety Engineer qualification)
- D. Functional Safety Engineer
- E. Installation and Maintenance Officer SIS

The following table defines the correlation between the qualification options and the associated training modules.

	Domain A	Domain B	Domain C	Domain D	Domain E
	Operations Officer SIS	Design Specialist SIS	Risk Analysis Officer SIS	Functional Safety Engineer	Installation and Maintenance Officer SIS
Duration of the training	1 d	2 d	2 d	3.5 d	2 d
Duration of the examination	1 h	2 h	2 h	3.5 h	2 h
Pre requisite concerning experience	1 year	2 years	2 years	2 years	1 year

### TRAINING

The training programmes are conducted in compliance with the good practice guidelines developed by the committee.

### EVALUATION

An evaluation is performed by the trainer at the conclusion of each training programme. It is carried out on the basis of the responses recorded on an examination questionnaire specific to each domain.

## LIST OF APPENDICES

Appendix 1	Sample template of the Competency Certificate
Appendix 2	The Pre-Requisite Reporting Form for the Functional Safety Engineer module

## Appendix 1

# Competency Certificate Template

SECURITE FONCTIONNELLE DES SYSTEMES INSTRUMENTÉS DE SECURITE  
FUNCTIONAL SAFETY OF SAFETY INSTRUMENTED SYSTEMS

## ATTESTATION DE COMPETENCE COMPETENCY CERTIFICATE

**Quali-SIL**

**INERIS 08-SIS-0001**

L'INERIS, Organisme responsable de la qualification Quali-SIL, atteste que :  
INERIS, the organisation responsible for the Quali-SIL qualification, certifies that :

**Madame / Monsieur Nom Prénom**  
**Ms / Mr First Name Last Name**

à l'issue de l'évaluation individuelle réalisée le : Jour / Mois / Année  
Following the individual assessment carried out on : Month / Day / Year

**a été reconnu(e) compétent(e) en tant que** : **Personne qualifiée**  
**Was recognised to have achieved qualification as** : **Qualified person**

pour la qualification suivante : **Domaine A à F, (explicite)**  
for the following domain : **Domain A to F, (specify)**

Désignation de l'entreprise : **Société ou Agence** / Company or Agency  
Name of the company :  
adresse / address 1  
adresse / address 2  
code postal / post code - ville /city  
pays / country

Cette attestation est valable jusqu'au : **XX / XX / XXXX**  
The present certificate is valid until : **XX / XX / XXXX**

Verneuil-en-Halatte, le / date **XX / XX / XXXX**

Le Directeur de la Certification  
Director of the Certifying Body



## Appendix 2

### Pre-Requisite Reporting Form for Functional Safety Engineers

**First Name and Last Name** \_\_\_\_\_

**Company / Organisation** \_\_\_\_\_

**Postal Address** \_\_\_\_\_

of Company / Organisation \_\_\_\_\_

Email \_\_\_\_\_

Telephone – Business \_\_\_\_\_

Fax \_\_\_\_\_

Current Position \_\_\_\_\_

For INERIS use only	Pre-requisites in compliance	YES <input type="checkbox"/>	NO <input type="checkbox"/>
---------------------	------------------------------	------------------------------	-----------------------------

**Experience in the field of functional safety**

Title / Position	Company / Organisation Name	Location
Start Date :	Description of the position held  Name of Manager :..... Date, Manager's Signature and Stamp of company / organisation :	
End Date :		
Number of months in functional safety :		

if necessary for summing up the 24 months of required experience, complete and submit this same reporting form for previous positions

Title / Position	Company / Organisation Name	Location
Start Date :	Description of the position held  Name of Manager :..... Date, Manager's Signature and Stamp of company / organisation :	
End Date :		
Number of days of training :		

Title / Position	Company / Organisation Name	Location
Start Date :	Description of the position held  Name of Manager :..... Date, Manager's Signature and Stamp of company / organisation :	
End Date :		
Number of days of training :		

Attach a document summarising all the training programmes conducted in functional safety with the following information: date, the number of days, the number of participants for each training course and the name of the company for in-house training programmes.

**Education / Qualification Level - minimum required Bac + 2 (French Baccalauréat + 2 years of higher education)**

University or School / College	Subject or Discipline taught	Level of qualification obtained	Date	Certificate or Degree / Diploma
Nam :				
City :				
Country :				

Attach a copy of the degree / diploma

University or School / College	Subject or Discipline taught	Level of qualification obtained	Date	Certificate or Degree / Diploma
Nam :				
City :				
Country :				

Attach a copy of the degree / diploma

Participant's First Name LAST NAME : ..... I hereby certify that the above information is accurate to the best of my knowledge, and have noted that incorrect information may at any time in the future result in the revocation of my qualification.	Date / Signature
---	------------------

If the education level attained is lower than Bac + 5 (French Baccalauréat + 5 years of higher education, equivalent to a postgraduate qualification), attach the appended testimonial from the employer attesting to a level of equivalent responsibility

To be completed if the educational qualification attained is of a level higher than or equal to Bac + 2 and lower than Bac + 5

**Participant Name** (*First LAST*) : .....

Testimonial issued by Name - *First LAST* .....

Functional Capacity (*supervisor, manager*) : .....

Employer Details (corporate name, status) :.....

Address : .....

.....

Area(s) of intervention in the employer structure : .....

.....

Job / Position held (*function, duration*) : .....

.....

Department / Unit: .....

Duties / responsibilities fulfilled as engineer : .....

.....

.....

I the undersigned, ....., hereby certify that Ms / Mr .... is employed as an engineer and as such is required to fulfill the responsibilities and demonstrate the skills and competencies consistent with such a position.

Place and date : .....

Signature and stamp of employer