



Choose certainty.  
Add value.

# CERTIFICATE

**Frank Moonen**

Has successfully completed the Functional Safety  
Certification Program requirements for

***Functional Safety Professional***

In accordance with  
IEC 61511:2016

Date issued: 20-November-2025  
ID number: TP11050404  
Field: Process Industry  
Subject: Safety Instrumented Systems

Two handwritten signatures in blue ink. The signature on the left is "G. Greil" and the signature on the right is "Dr. Michel Houtermans".

G. Greil  
Certifier

Dr. Michel Houtermans  
Trainer

# C U R R I C U L U M

- **Functional safety management:**  
Life cycle concept, documentation requirements, verification, validation, assessments and audits, modifications
- **Hazard & Risk Analysis:**  
Hazard identification, hazard analysis, risk reduction, safety function definition using FTA, HAZOP, LOPA, Risk matrix, risk graph
- **Planning the safety system:**  
Planning for end users, integrators, and realization of safety systems, safety plan, verification plan, validation plan, safety requirement specification, requirements for suppliers, FAT, SAT
- **Hardware design:**  
Hardware lifecycle, energize vs de-energize, low demand, high demand, demand mode, continuous mode, redundancy, diversity, voting, hardware fault tolerance, safe failure fraction, type A/B, architectural constraints, proof testing, diagnostic tests, measures to avoid and control failures
- **Hardware reliability:**  
Reliability modeling, FMEDA, simplified equations, block diagrams, FTA, Markov, failure data, HFT, SFF, DC, CCF, SIL, PFH, PFD
- **Software design:**  
Software lifecycle, embedded software, application software, utility software, fixed programming languages, limited variability languages, full variability languages, software architecture, V-model, measures to avoid failures
- **Operation and maintenance:**  
Installation and commissioning, safety validation, operation, maintenance and repair, modification and retrofit, maintenance override
- **Experience:**  
The holder of this certificate has more than 6 years experience in more than 2 functional safety projects