

FUNCTIONAL SAFETY AUTOMOTIVE

TRAINING AND PERSONAL QUALIFICATION

PUBLIC TRAININGS, IN-HOUSE SEMINARS, WEBINARS
PERSONAL QUALIFICATION ON ISO 26262



THE SGS GROUP

is the leader in the fields of testing, verification and certification with 75,000 employees worldwide. Founded in 1878, SGS headquartered in Geneva has been setting benchmarks for top standards that are recognized around the world. Since 1920 SGS has been active in Germany.

SGS-TÜV SAAR GMBH

as a joint venture between SGS and TÜV Saarland e.V. supports you in all matters relating to Functional Safety. As an accredited services provider, we are active in the areas of training, consultancy, safety analytics, testing and certification. We define ourselves as your global business partner along the entire value chain.

THE EXPERTS

of SGS-TÜV Saar actively participate as members of the relevant standardization bodies. Therefore, we are consistently involved in the further development of the state of science and technology and are able to provide our customers with comprehensive consultancy and training in this field.



OUR TRAINING PROGRAMME

You have to optimally implement the complex new ISO 26262 standard to guarantee Functional Safety on the one hand and to keep your efforts and costs within reasonable limits on the other?

You need a training programme that allows you and your staff to meet every requirement while keeping a handle on rising cost pressures?

A training programme that reflects all current development in the field of Functional Safety – a training programme with contents that are imparted by the most competent and expert trainers:

THE TRAINING PROGRAMME OF SGS-TÜV SAAR

The years of experience of our experts in the field of Functional Safety have been incorporated into our training programme presented on the following pages. We have designed it as a modular system. This allows you to individually select your topics and to use your training as effectively as possible.



Marcus Rau, Head of Training

YOUR TEAM OF TRAINERS

The trainer team is led by Marcus Rau, Head of Functional Training Safety at SGS-TÜV Saar.

He previously worked as a team leader and training manager for Functional Safety at another TÜV organization for eight years.

Before, Marcus Rau had gathered more than ten years of practical safety experience as a planning engineer and Technical Representative for Functional Safety at Linde Engineering. He is a member of German Standardization Bodies.

Marcus Rau is supported by a team of experienced trainers. Every one of them draws on many years of experience in how to put Functional Safety requirements into practice.



TRAINING CATEGORIES AND TARGET GROUPS

Every one of our training modules is tailored exactly to the needs of the target group and conveys the specific contents. Our offering ranges from 2- to 3-hour introductory sessions primarily addressing decision makers through to special modules for hardware and software developers. In addition, our experts are able to develop workshops for your individual topics of interest from which you benefit in your day-to-day work, which is a key advantage in view of consistently increasing time and cost pressures.

AT SGS-TÜV SAAR, WE EXCLUSIVELY USE TRAINERS WHO DRAW ON MANY YEARS OF EXPERIENCE IN THEIR SUBJECT AREA AND WHO HAVE PREVIOUSLY SUPPORTED OR ARE CURRENTLY SUPPORTING RELEVANT PROJECTS.

| Training Categories | Target Groups | | | | |
|------------------------------------|---|--------------------|----------------------|------------------------|------------------------|
| | MANAGERS/ PROJECT LEADERS/QM RESPONSIBLE | SAFETY MANAGERS | SYSTEM DEVELOPERS | SOFTWARE DEVELOPERS | HARDWARE DEVELOPERS |
| INTRODUCTION | ■ | ■ | | | |
| OVERVIEW OF STANDARDS | ■ | ■ | ■ | ■ | ■ |
| FUNCTIONAL SAFETY MANAGEMENT (FSM) | ■ | ■ | | | |
| CONCEPT/SYSTEM | ■ | ■ | ■ | | |
| SOFTWARE | | ■ | | ■ | |
| HARDWARE | | ■ | | | ■ |
| ANALYTICS | | ■ | ■ | ■ | ■ |
| SPECIAL TOPICS | | ■ | ■ | ■ | ■ |



TRAINING VARIANTS

You have the choice between four variants for your individual training.

■ VARIANT 1

You join us in Munich or at another specified training location, stay at a first-class hotel and can fully concentrate on the training. Of course we will create an atmosphere that will make you feel comfortable throughout your stay.

■ VARIANT 2

You have our trainers travel to a location of your choice such as your company. This gives you the benefits of saving travel costs for your staff and staying within a closed circle that will allow you to discuss companyinternal topics as well.

■ VARIANT 3

This is an extension of Variant 2 where you specify the training contents yourself. To enable you to make a targeted selection we will provide you with an overview of the sub-modules of our trainings. Alternatively, you just let us know your issue relating to Functional Safety and we will develop a tailor-made workshop for you.

■ VARIANT 4

Free 1–2 hour webinars. You will receive a quick overview of the objectives and contents of the standard. Questions can also be put to the speaker.

| Training Variants | | | | |
|--------------------|--|--|---|--|
| | VARIANT 1 | VARIANT 2 | VARIANT 3 | VARIANT 4 |
| DESCRIPTION | Public trainings | In-house Module trainings (standard modules) | In-house Customized trainings (compiled from standard modules) | E-learning Web-based training presentations with voiceovers |
| DATES | On scheduled dates (registration at www.sgs-tuev-saar.com/fs-training) | Subject to coordination | Subject to coordination | For specific dates (application for registration can be found under www.sgs-tuev-saar.com/fs-training) |
| PLACE | Munich, Dortmund, (further details see www.sgs-tuev-saar.com/ fs-training) | Subject to coordination | Subject to coordination | Online |

COMPLETE OVERVIEW OF TRAINING MODULES

The overview shows all of the training modules currently available for automotive. The training modules can be booked separately.

The basic modules are intended for all beginners in the subject matter of standards, with or without previous training in functional safety.

The advanced modules intensify the learning content of the basic modules.

The first contact with standards can be made easier with our free introductory module K0, which gives an initial overview of the objectives and content of ISO 26262.

Our K1 module compresses the contents of the K2–K6 training modules into 2 days and is therefore intended for those wanting a concise introduction to all parts of the standard.

| | INTRODUCTION | OVERVIEW OF STANDARDS | FSM | CONCEPT DEVELOPMENT |
|--------------|---|------------------------------------|--|---|
| CODE | K0 | K1 | K2 | K3 |
| AFSP-MODULE | | | Day 1 | Day 2 |
| TITLE | The Functional Safety challenge in automotive development | Overview of ISO 26262 requirements | Safety management processes/supporting processes | From the risk analysis to the Functional Safety Concept |
| SUB-TITLE | Core statements of ISO 26262 | All parts | Acc. to ISO 26262-2 and -8 | Acc. to ISO 26262-3 |
| DURATION | 2-3 hours | 2 days | 1 day | 1 day |
| TARGET GROUP | Decision makers (management), all interested | All personnel involved in FS | Project managers, safety managers, QM managers | Safety managers, project managers, function developers |

| | Advanced module | | | |
|--------------|--|---|--|---|
| CODE | K21 | K31 | K41 | K61 |
| TITLE | Safety-related production process | Detailed Hazard Analysis | SEooC – Safety Element out of Context | Software Verification |
| SUBTITLE | ISO 26262-7 requirements | Practice-oriented assessment of hazards | SEooC development using an example from the semiconductor industry | Proof of safety for safety-related SW component |
| DURATION | 1 Day | 1 Day | 1 Day | 1 Day |
| PREREQUISITE | Basic knowledge of ISO/TS 16949 | Basic knowledge of GuR (e.g. K3 basic module) | Basic knowledge of safety-related hardware development (e.g. the K5 basic module) | Basic knowledge of safety-related SW development (e.g. the K6 basic module) |
| TARGET GROUP | Safety Managers, Production Planners, Production Supervisors | AFSP, Safety Managers, System Supervisors | AFSP, Safety Managers, Hardware Developers, Developers of intelligent semiconductors | AFSP, Safety Managers, SW-Testers, SW-Developers |

**FURTHER INFORMATION, DATES
AND A REGISTRATION FACILITY
ARE AVAILABLE AT
WWW.SGS-TUEV-SAAR.COM/FS-TRAINING**

Basic module

| SYSTEM DEVELOPMENT | HARDWARE DEVELOPMENT | SOFTWARE DEVELOPMENT | ANALYTICS | LAW |
|---|--------------------------------------|--------------------------------------|--|--|
| K4 | K5 | K6 | K7 | K8 |
| Day 3 | Day 4 | Day 5 | Day 6 | |
| Technical safety concept and system design | Safety-oriented hardware development | Safety-oriented software development | Methodical approach to safety analysis | Legal requirements in the context of ISO 26262 |
| Acc. to ISO 26262-4 | Acc. to ISO 26262-5 | Acc. to ISO 26262-6 | Acc. to ISO 26262-9 | |
| 1 day | 1 day | 1 day | 1 day | 1 day |
| Safety managers, system developers, hard- and software developers | Safety managers, hardware developers | Safety managers, software developers | Safety managers, analytical engineers | Safety managers, decision makers, QM managers, lawyers |

| K71 | K72 |
|---|--|
| Fault Tree Analysis (FTA) | Hardware Analysis (FMEDA) |
| FTA applications in automotive development according to ISO 26262 | FMEDA applications in the development of automotive electronics |
| 1 Day | 1 Day |
| Basic knowledge of analytical methods (e.g. the K4 basic module) | Basic knowledge of analytical methods (e.g. the K5 basic module) |
| AFSP, Safety Managers, System Developers and Analysts | AFSP, Safety Managers, HW-Developers, Analysts |



LEARNING-BY-DOING

We know that participants learn most by interacting with the subject. We therefore actively encourage discussion of Functional Safety topics in our seminars. During the five-day AFSP training we simulate the complete safety lifecycle of a Functional Safety project, creating the work products starting with the item definition through to the Safety Analysis.

WORK PRODUCTS CREATED DURING THE SIMULATED PROJECT



We select the subject (item) of the simulated project depending on the training group. Different example projects are available.

The required safety integrity (ASIL) and the associated safety goals are determined.

A Functional Safety concept is created to achieve these safety goals and derives further parameters, such as the safe condition and fault tolerance time. A preliminary functional architecture is created including ASIL decomposition for elements of the system. Technical safety requirements are then derived from the Functional Safety requirements and the draft architecture of the system. A possible system design is drafted including a description of the technical safety measures. At system level the necessary integration tests and steps to confirm the safety goals at vehicle level are defined. At hardware level, the required probabilistic hardware metrics are determined. At software level the necessary, ASIL dependent, development methodologies identified. At the end, participants of all courses have a complete Functional Safety documentation folder.



OUR PERSONAL QUALIFICATION PROGRAMME

The more complex the technology the more experts for Functional Safety are needed.

BUT THE QUESTION IS: WHO IS AN EXPERT FOR FUNCTIONAL SAFETY?

ISO 26262 does not answer this question. On the one hand it demands that only experts assess or manage Functional Safety but on the other it does not specify any of the prerequisites to be met by someone who may be considered an expert.

SGS-TÜV Saar as an accredited services provider now offers you the possibility to impart the technical knowledge for Functional Safety to personnel and to thereby qualify them.

As an individual possessing this qualification, you justify or even increase your market value. As a business, you have the opportunity to have your staff qualified by an independent party and to secure this technical knowledge for the long term.

QUALIFICATION PROGRAMME FAQS

■ WHAT IS A PERSONAL QUALIFICATION PROGRAMME?

We qualify you or your staff for working with Functional Safety. SGS-TÜV Saar has developed a 2-step qualification programme for this purpose. After successful completion of this programme the „SGS-TÜV Saar“ seal confirms to the attendee that he/she is an expert for Functional Safety.

■ WHAT EXPERT STATUS CAN BE ACQUIRED AND WHAT ARE THE PREREQUISITES TO ACQUIRE IT?

The first level of expert status is called „AFSP“ (Automotive Functional Safety Professional). You receive this designation after successfully passing a 2-hour exam. Attendance of the preparatory training modules or, alternatively, proof of completion of equal training, is a prerequisite for admission to the test.

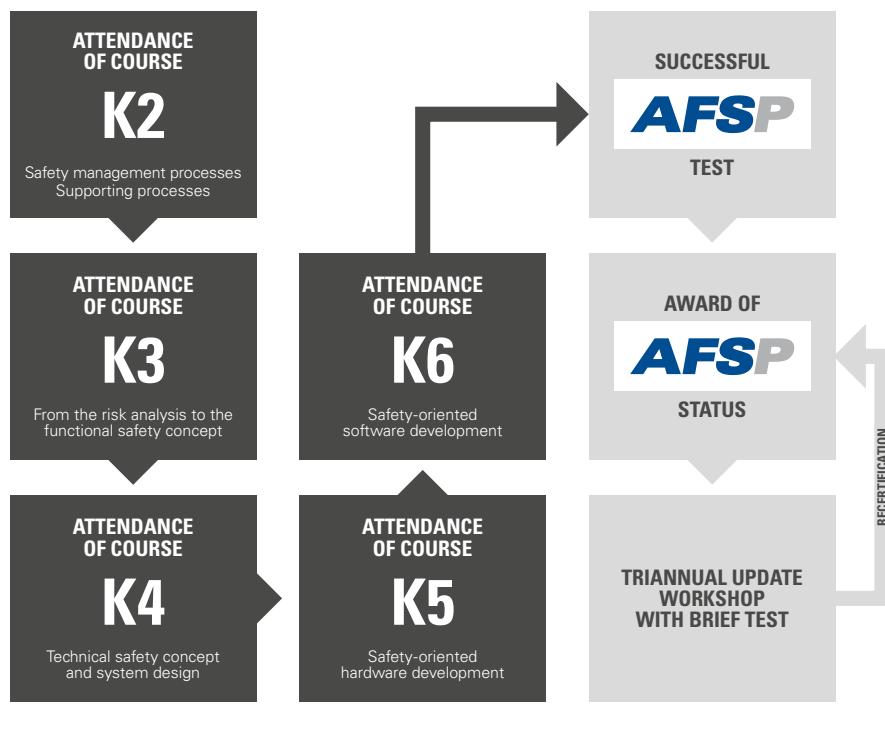
The second expert status is called „AFSE“ (Automotive Functional Safety Expert): To attain it, you will have to demonstrate that you have performed relevant work for at least five years. Individuals desiring to achieve this status have to apply with the SGS-TÜV Saar Testing Commission, document their experience in Functional Safety and successfully pass a qualification audit.



AFSP/AFSE CONDITIONS, RE-CERTIFICATION

| | AFSP | AFSE |
|---|---|--|
| CONDITIONS TO RECEIVE TITLE (FIRST TIME) | <ul style="list-style-type: none">■ Visit of trainings K2 to K6 at SGS-TÜV Saar, alternative similar training of another supplier | <ul style="list-style-type: none">■ Minimum 5 years job experience in the automotive industry (CV required)■ 3,000 h work in Functional Safety area within the last 3 years (confirmation of employer and activity report required) |
| APPOINTMENT | <ul style="list-style-type: none">■ Successful participation in the AFSP-exam (min. 60 % of achievable points) | <ul style="list-style-type: none">■ Successful audit by AFSE-commission (3 h)<ul style="list-style-type: none">■ Presentation of activities by audited person■ Development of a „Case Study“■ Expert interview |
| VALIDITY OF THE TITLE | 3 years | 3 years |
| CONDITIONS FOR RECERTIFICATION | <ul style="list-style-type: none">■ Evidence of minimum 3 days further training in Functional Safety within the last 3 years<ul style="list-style-type: none">■ Trainings and workshops■ Participation in congresses (1 day will be taken in account)■ Articles in magazines (for each 2 articles 1 day will be taken in account)■ 1,500 h work in Functional Safety area within the last 3 years (confirmation of employer and activity report required)■ Participation in an update workshop with successful exam (short version) | <ul style="list-style-type: none">■ Evidence of minimum 3 days further training in Functional Safety within the last 3 years<ul style="list-style-type: none">■ Trainings and workshops■ Participation in congresses (1 day will be taken in account)■ Articles in magazines (for each 2 articles 1 day will be taken in account)■ 1,500 h work in Functional Safety area within the last 3 years (confirmation of employer and activity report required) |

AFSP QUALIFICATION STEPS



Attendance of the training modules may be substituted by demonstrated completion of equal further education/training.

REGISTRATION

You may register to attend the personal qualification programme and/or relevant trainings and tests either by fax or online at www.sgs-tuev-saar.com/fs-training.

We will also be pleased to discuss the steps which may still be required if you should already possess relevant experience. Of course we will also elaborate appropriate courses of actions that correspond to your existing know-how.

Additional information on dates, fees and training locations is available on the internet at www.sgs-tuev-saar.com/fs-training.

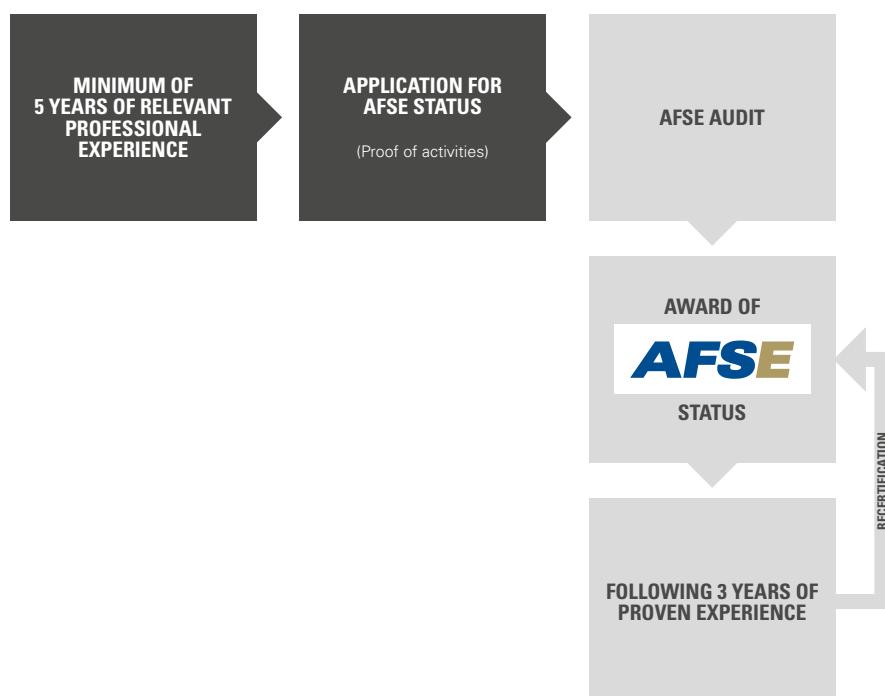
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AFSE QUALIFICATION STEPS



SGS IS THE WORLD'S LEADING INSPECTION, VERIFICATION, TESTING AND CERTIFICATION COMPANY. SGS-TÜV SAAR, AS A JOINT VENTURE BETWEEN SGS AND TÜV SAARLAND E.V., ENSURES THE RELIABILITY AND QUALITY OF PROCESSES, PRODUCTS, AND TECHNICAL SERVICES.

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WHEN YOU NEED TO BE SURE

