

# TÜV / FSENG CERTIFICATION

(FUNCTIONAL SAFETY ENGINEERING) CERTIFICATION - SAFETY INSTRUMENTED SYSTEMS  
OR TÜV FUNCTIONAL SAFETY QUALIFIED



	COURSE #	COURSE NAME	LOCATION	DATE
<b>2010</b>	010-435	TÜV FSEng - SIS	Calgary, AB	Sep 27-30
	010-462	TÜV FSEng - SIS	Edmonton, AB	Oct 4-7
	010-467	TÜV FSEng - SIS	San Diego, CA	Oct 25-28
	010-444	TÜV FSEng - SIS	Calgary, AB	Nov 22-25
<b>2011</b>	011-407	TÜV FSEng - SIS	Calgary, AB	Jan 24-27
	011-417	TÜV FSEng - SIS	San Diego, CA	Feb 21-24
	011-427	TÜV FSEng - SIS	Calgary, AB	Mar 21-24
	011-437	TÜV FSEng - SIS	San Diego, CA	April 25-28
	011-447	TÜV FSEng - SIS	Calgary, AB	May 24-27
	011-457	TÜV FSEng - SIS	San Diego, CA	June 27-30
	011-467	TÜV FSEng - SIS	Calgary, AB	July 25-28
	011-477	TÜV FSEng - SIS	San Diego, CA	Aug 22-25
	011-487	TÜV FSEng - SIS	Calgary, AB	Sept 26-29
	011-497	TÜV FSEng - SIS	San Diego, CA	Oct 24-27
	012-407	TÜV FSEng - SIS	Calgary, AB	Nov 28-Dec 1
	012-417	TÜV FSEng - SIS	San Diego, CA	Dec 19-22

Course Fee: **\$2,995** per student

Includes course registration, course materials, lunch and refreshments, exam, & a submission to TÜV. Price is exclusive of applicable taxes. Courses held in the U.S are billed in U.S. dollars.

## COURSE OBJECTIVE

The TÜV Functional Safety Program supports engineers or any person working in the functional safety business. It supports the professional development of practitioners in the field of functional safety by incorporating the principles of IEC 61511 and other relevant international standards into a training course designed to add to their depth of knowledge and understanding of the subject. The program also offers engineers who possess significant work experience in the field of functional safety the ability to obtain a certificate verifying their expertise. For more information, refer to [www.tuvasi.com](http://www.tuvasi.com)

ACM's TÜV **Functional Safety Engineering** training course within the TÜV Functional Safety Program has been reviewed and accepted by TÜV Rheinland Industrie Service GmbH - Automation, Software and Information Technology (ASI). For more information, refer to [www.acm.ab.ca](http://www.acm.ab.ca)

## WHO SHOULD ATTEND?

This course is well suited to engineers and technologists who aim to follow the best engineering practices with regard to the application of Safety Instrumented Systems in the process industry, including:

- ◆ Risk professionals responsible for establishing corporate tolerable risk targets
- ◆ Managers / Team Leaders responsible for determining SIS design standards
- ◆ Engineers and technicians responsible for ensuring that SIS have been designed to appropriately mitigate the level of risk identified
- ◆ Project Managers who need to understand the concepts and principles of IEC 61508 & 61511
- ◆ Engineers involved in any aspect of the SIS Safety Lifecycle

## COURSE INSTRUCTORS

### Mr. Malcolm Harrison, B.Sc. Mech. Eng., P.Eng., TÜV F. S. Expert

Mr. Harrison is a P. Eng. with over 40 years experience in Instrumentation and Controls. Malcolm spent over 35 years with Shell and has diversified upstream and midstream experience in the heavy oil, offshore, refining and gas processing sectors. He is an experienced SIL Determination facilitator and has worked on billion dollar projects ensuring horizontal I & C alignment between multiple EPCMs. Malcolm is a TÜV Functional Safety Expert and leads training workshops globally for ACM.

### Ken Bingham, CET, TÜV F. S. Expert

Mr. Bingham is the Principal of ACM Facility Safety and a TÜV certified Functional Safety Expert. His background is in engineering design and management, involving safety, instrumentation, electrical and control systems. With Ken's 27 years on the client side, integration side and the SIL consulting side, he brings a holistic and practical perspective. Mr. Bingham has participated on ISA S84 SIL standard committees, has presented numerous papers and courses on SIL Analysis and is the Chief Technical Architect for ACM's field proven, IEC 61511 compliant Safety Integrity Level (SIL) Life Cycle tool, SilCore™.

## COURSE OUTLINE / DURATION

- ◆ Three (3) days of classroom instruction by a TÜV Functional Safety Expert
- ◆ Morning of Day Four – Final Exam (4.5 hours) - 120 multiple choice and 4 working problems

## FINAL EXAM

A passing mark of 75% is required on the Final Exam. Students should bring a complete, unmarked copy of the full IEC 61511 - *Functional safety - Safety instrumented systems for the process industry sector* standard to the course. It is the only reference material allowed into the exam. The standard is readily available from various sources, including the ISA web site <http://www.isa.org/>

## PARTICIPANT ELIGIBILITY REQUIREMENTS

In accordance with the TÜV Functional Safety Program guidelines, students should possess:

- ◆ A minimum of 3 to 5 years experience in the field of functional safety
- ◆ University degree or equivalent engineer level responsibilities status as certified by employer

Participants are eligible to receive a TÜV certificate and to use the title "TÜV Functional Safety Engineer" concerning Safety Instrumented Systems within the TÜV Functional Safety Program provided that they:

- ◆ Attend ACM's TÜV Functional Safety Program training in Safety Instrumented Systems;
- ◆ Pass the Final Exam after attending ACM Automation Inc. training; Meet all other eligibility criteria according to the TÜV Functional Safety Program.

Note: Participants who meet these requirements without a professional engineer designation (ie. Technologists) will be given the option of selecting either the "TÜV Functional Safety Engineer" or "TÜV Functional Safety Qualified" title. These individuals alone are responsible and liable for the use of the protected logo / mark / title in the jurisdiction of their registered residence.

## COURSE AGENDA

The course follows the framework of the SIS Lifecycle within the IEC standards.

Day 1	Day 2	Day 3	Day 4
Overview of TÜV Program Why are we here? Introduction to Safety Instrumented Systems Overview of IEC 61511 Standard Phase 10 - Management of Functional Safety Phase 1 - Hazard & Risk Analysis Phase 2 - Allocation of Safety Functions to Protection Layers SIL Determination Methods - Fault Tree - Safety Layer Matrix	SIL Determination Methods (continued) - Calibrated Risk Graph - LOPA Phase 3 - Safety Requirements Specification Phase 4 - SIS Design & Engineering	Phase 4 - SIS Design & Engineering (Cont'd) Phase 5 - Installation, Commissioning & Validation Phase 6 - Operation & Maintenance Phase 7 - Modification Phase 8 - Decommissioning Phase 9 - Verification Phase 10 - Assessment & Auditing Phase 11 – SLC Structure & Planning	Morning – 4.5 hr exam

**CONTACT ACM TO REGISTER**




Registration form available at : [www.acm.ab.ca/register](http://www.acm.ab.ca/register)

Contact Jacqueline Schmautz for further information at [jschmautz@acm.ab.ca](mailto:jschmautz@acm.ab.ca)

or call toll free at 1-877-264-9637

- *ACM Facility Safety is a recognized global provider of Process Safety training, tools and methodologies*
- *ACM prides itself on neutral, third party unbiased workshop oriented training sessions developed from real life experiences of our instructors*
- *Our instructors have lived and implemented all phases of the IEC 61511 Safety Lifecycle during their careers at some of the world's largest operating companies*
- *Our lead instructors are practitioners with industry experience and are available for private in-house sessions at your facilities*

**OUR LEAD INSTRUCTORS**

"We developed these courses and workshops based on real life situations"	"Global Expertise"	"Lived all phases of the Safety Lifecycle"
 <p><b>Malcolm Harrison, B.Sc. Mech. Eng., P.Eng., TÜV F. S. Expert</b></p> <p>Mr. Harrison is a P. Eng. with over 40 years experience in Instrumentation and Controls. Malcolm spent over 35 years with Shell and has diversified upstream and midstream experience in the heavy oil, offshore, refining and gas processing sectors. He is an experienced SIL Determination facilitator and has worked on billion dollar projects ensuring horizontal I &amp; C alignment between multiple EPCMs. Malcolm is a TÜV Functional Safety Expert and leads training workshops globally for ACM.</p>	 <p><b>Marcel Leal-Valias, CET, PHA/PSM Expert</b></p> <p>Mr. Leal-Valias has 47 years experience in Engineering, Process Design &amp; Drafting, mechanical maintenance, and project management. Mr. Leal-Valias has been a Piping Manager, Construction Site Manager, Project Manager and for the last 20 years, he has developed and become an internationally respected Process Hazards Analysis (PHA/HAZOP) trainer and facilitator performing hundreds of PHA studies for all types of facilities. Mr. Leal-Valias has a broad operational understanding of all exploration, production and refining facets of the oil and gas industry as a result of 45 years spent in international postings in Brazil, Australia, and Canada.</p>	 <p><b>Ken Bingham, CET, TÜV F. S. Expert</b></p> <p>Mr. Bingham is the Principal of ACM Facility Safety, Chief Technology Officer and a TÜV certified Functional Safety Expert. His background is in engineering design and management, involving safety, instrumentation, electrical and control systems. With Ken's 27 years on the client side, integration side and the SIL consulting side, he brings a holistic and practical perspective. Mr. Bingham has participated on ISA S84 SIL standard committees, has presented numerous papers and courses on SIL Analysis and is the Chief Technical Architect for ACM's field proven, IEC 61511 compliant Safety Integrity Level (SIL) Life Cycle tool, SilCore™ the only tool in the world that prepares you in real time for loss of safeguards and ACM's MP Real-time risk exposure tool with contingency planning.</p>