



PROGRAMME

Functional Safety Engineering Processes: not a burden but a benefit

Thursday, April 29th 2010

De Montil, Moortelstraat 8, 1790 Essene, Belgium

9.00h Reception and coffee

9.25h Welcome

Herm Lux, Account manager Flanders' DRIVE, Lommel, Belgium

9.30h Zen and the art of safety engineering

Eric Verhulst, CEO, Altreonic, Linden, Belgium

The perfectly safe car could be the one that doesn't move. Clearly, more will be needed to make such a Panamarenko car acceptable as a real car. What's needed is a total concept of Trustworthiness. The trust that it works as advertised means not only good systems engineering but also that it works as advertised under all circumstances. Albeit an important one, safety is just one of the required system properties.

10.00h Functional Safety Engineering Standardization

Geert Boogaerts, Product Manager Risk and Environment

Kristophe Van Immerseel, Contract Manager Risk & Environment

Vinçotte Environment, Vilvoorde Belgium

This presentation starts by explaining the scientific background on basis of reliability engineering of the basic standard and derived standards in the framework of electric, electronic and electronic-programmable functional safety systems. The various standards (IEC 62061, 60601, 50126, 50128, 50129, ...) are discussed briefly, with the IEC 61508 as a starting point. Then the used definitions (random failures, systematic failures, common mode failures, safe failure fraction, diagnostic coverage,...), common to all standards, are explained in more detail. Hereafter the basic principles of the SIL (Safety Integrity Level) determination are treated and illustrated and finally the SIL verification is discussed.

10.45h Break

11.00h Functional Safety Engineering in Machinery

Bert Paquet, Competence Centre Manager EE&S, CNH, Zedelgem, Belgium

The Machine Directive and additional safety regulations are pushing OEM's to put in place robust processes in order to achieve compliance with the appropriate safety standards covering all machine functionalities. In particular for X-by-wire, mechatronic systems need special attention regarding the system architecture and the system design approach resulting in a safe, yet reliable, product.

11.30h **Functional Safety Engineering in Off-Highway**
Christophe Thomas, Manager Controls Group, Dana Spicer Off-Highway, Brugge, Belgium

In off-highway the vehicles have to create productivity by optimizing the cooperation between driving function and working function. The functional safety has to be fulfilled for both at the same time. The functional safety standards of the machinery industry and those for the different off-highway market segments (fork-lift trucks, earth moving machinery, agricultural, ...) have to be fulfilled by Tier I supplier with the same solution to be competitive in product cost and development cost. Moreover the off-highway OEM's are working more and more according to, on-highway processes and requirements. How can a Tier I supplier take advantage of those constraints?

12.00h **Functional Safety Engineering in Railway**

We would be pleased to present you here a topic on Functional Safety Engineering in Railway.

12.30h **Lunch**

13.30h **Functional Safety Engineering in Automotive (On-Highway)**
Marnix Lannoije, R&D Manager, Flanders' DRIVE, Lommel, Belgium

The Audi dynamic steering system is not only one of the greatest innovations in the new Audi A4, A8 and Q5, but also a rolemodel of how complex mechatronic and safety-critical systems are developed today in the automotive industry. The presentation describes not only the design but also the realization of the functions and the safety concept to the latest automotive standards. The basis is the functional requirements from the sight of the driver and the risks attached. These requirements are allocated to the various components so that they comply to the functional specifications and to the required safety criteria and safety integrity requirements. The actual application is demonstrated based on a detailed subsystem. To be able to prove the fulfillment of all functional and safety requirements, it is demonstrated how the final comprehensive test strategy is conceptually structured and implemented.

14.00h **Software Engineering for Safety Critical Aerospace Applications**
Jean-Louis CAMUS, Safety Manager, Esterel Technologies, Toulouse, France

A number of aerospace systems and their software are highly safety or mission critical. This presentation will provide an overview of the requirements currently imposed for software development, in particular by DO-178B for civil avionics. It will then explain how modern model-based software development allows addressing highly complex software developments within competitive time/effort budget.

14.45h **Functional Safety Engineering in Medical**
Yves Arys, Managing Director, NiniX Technologies, Brugge, Belgium

This presentation will give you an idea how to tackle 'functional safety' over the life cycle of a medical device and give you a view to our practical approach used. I will address briefly the European regulations (COUNCIL DIRECTIVE 93/42/EEC amended by 2007/47/EC) and how to classify a device. I will try to elucidate some of the specific tools used in the quest to proof compliance as there are: Quality management systems ISO13485, international standard IEC 60601, risk management to medical devices ISO 14971 and Medical device software life cycle process IEC 62304.

15.30h **Break**

15.45h

Flanders' DRIVE 'ASIL' Project

Bert Dexters, Project leader, Flanders' DRIVE, Lommel, Belgium

In this presentation, the collective Flanders' DRIVE research project 'Automotive Safety Integrity Levels' will be presented. In this project, a system safety & engineering development methodology is created, based on leading international functional safety standards, which can be applied regardless of the type of vehicle or machine. The 'ASIL' project is running since January 2009.

16.15h

FMTC 'Safety architectures' Project

Peter Coenen, Project leader, FMTC, Heverlee, Belgium

A growing number of functions in a machine are becoming safety related. Moreover, modern machine controllers increasingly use smart sensor, wireless communication and programmable platforms (processors, FPGAs). To integrate these safety functions in their control platform, a machine manufacturer must be able to define safety architectures using these new technologies, calculate their reliability, and let the solutions certify with a notified body. This project will build up the knowledge for the manufacturers to perform these tasks.

16.45h

Panel discussion

Bert Dexters, Project leader, Flanders' DRIVE, Lommel, Belgium

17.15h

Conclusions followed by a networking drink