

PROGRAMME

Functional Safety In the Vehicle Industry

Presentation of the expertise acquired in the research project "Automotive Safety Integrity Levels"

17 January 2013

De Montil nv, Moortelstraat 8, 1790 Affligem (Essene), Belgium

09.30h	Welcome and introduction
10.00h	Preparing a truck OEM for the challenges of ISO 26262 Guillermo Molina, Safety Officer, Volvo Group Trucks Technology, Sweden
	This presentation addresses the challenges of and experiences with introducing the ISO 26262 standard for truck development within Volvo GTT. Getting everybody on board: from upper management to design engineers and purchasers. Preparing for major changes: applying principles of change management to the introduction of ISO 26262. Dealing with suppliers already working with ISO 26262 and working with different development processes in ongoing projects.
10.30h	The Flanders' DRIVE research project "Automotive Safety Integrity Levels" Bert Dexters, Project Manager, Flanders' DRIVE
	A sound engineering methodology is not only a must for safety-critical applications. It is often also more economical to resolve issues at the design stage and not later on when the product has been developed or is already in production. Often, a formalized approach can also result in a more cost-efficient design. Complexity is not only the enemy of safety but also of cost efficiency. With a sound methodology, everybody wins. Flanders' DRIVE, developed a functional safety engineering methodology based on the leading vehicle and machinery functional safety standards and this together with 6 partners (*) in the Flemish industry and with support of TÜV NORD Mobilität and KdG Hogeschool. This presentation demonstrates the methodology and the learnings achieved via practical use-cases.
11.00h	Coffee break
11.30h	Hazard analysis and risk assessment for on- and off-road vehicles Christophe Thomas, Manager Controls Development and Bjorn Aelvoet, Project leader embedded systems and functional safety, Dana Spicer Off-Highway, Belgium
	In off-highway applications, vehicles must create productivity by optimizing the cooperation between the driving function on the one hand and working functions on the other. The functional safety standards of the

between the driving function on the one hand and working functions on the other. The functional safety must be fulfilled for both at the same time. The functional safety standards of the machinery industry and those applying to the different off-highway market segments (fork-lift trucks, earthmoving machinery, agricultural machines etc.) must be fulfilled by one and the same solution that is competitive both in product and development cost. Moreover, off-highway OEM's are working even more according to on-highway processes and requirements. This presentation demonstrates how to perform the hazard analysis and risk assessment.

12.00h Lunch

(*) These are the partners working together with Flanders' DRIVE on the ASIL research project: DANA Spicer-Off Highway, Grammer EIA Electronics, Punch Powertrain, Triphase, Altreonic and PsiControl Mechatronics. The project is supported financially by the Flemish government.

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13.00h Functional safety concept for the research project "Electric Powertrain"

Yoann Descas and Marc Van Vlimmeren, Functional Safety Engineers, Flanders' DRIVE

The Electric Powertrain is a role model showing how complex mechatronic and safety-critical systems are developed today in the automotive industry. The presentation describes the realization of the functional safety concept according to the latest automotive standard ISO 26262. The functional requirements from the driver's point of view and the risks attached form the basis. These requirements are then allocated to the various components so that these comply with the functional specifications and the preset functional safety requirements. This presentation highlights techniques such as Fault Tree Analysis (FTA) and addresses the benefits of using SySML activity diagrams to support the functional safety concept. Aspects of requirements traceability are covered as well.

13.30h Challenges of functional safety on the automotive and railway market – A comparison

Luc De Coen, Technical Director, Bombardier Transportation, Division Propulsion and Controls, France

For railway infrastructure, safety has been a key element since the early days. Recent incidents are an indication for the ever present focus of society on railway incidents. Where initially safety was addressed in technical terms, in more recent years a functional approach has become necessary to cope with the changing background setting: evolving and ever complexer technologies as well as the changed market situation linked to the European framework and legislation. Starting from these two aspects – technology and market – the impact on safety engineering, homologation and organizational aspects of rolling stock and railway infrastructure projects is illustrated and a comparison with the automotive functional safety standards is made.

14.00h Break

14.30h Definition of machine safety architectures including smart sensors, wireless communication and programmable platforms

Peter Coenen, Project Manager, Flanders' Mechatronics Technology Centre, Belgium

A growing number of functions in machines are becoming safety-related. Moreover, modern machine controllers increasingly use smart sensors, wireless communication and programmable platforms (processors, FPGAs). To integrate these safety functions in their control platform, machine manufacturers must be able to define safety architectures using these new technologies, calculate their reliability, and have their solutions certified by a registered body. This presentation highlights the knowledge needed for manufacturers to perform these tasks.

15.00h Cross-domain systems and safety engineering: is it feasible?

Eric Verhulst, Chief Technology Officer, Altreonic, Belgium

Why do we have different systems and safety standards for each domain? There are certainly historical reasons that have led to different approaches. And up to today, different standards are still unavoidable for certification reasons. However, the question remains whether it should stay this way. After all, safety concerns us all and good engineering principles are universal. Recent experiences and projects like Flanders DRIVE ASIL and the EU FP7 OPENCOSS project indicate that it is not only feasible but also desirable for technical as well as economic reasons. The speaker will show that the trend towards a unified systems engineering approach is already happening and that recent standards like CENELEC 50128 and DO-178C reflect this. What we see is a transition towards a systematic but highly iterative process whereby process and development artifacts are continuously verified. The future is not only safer but also lean and agile. The economic benefits are competitiveness, efficiency and trustworthy products and systems.

- 15.30h Panel discussion
- 16.00h Networking drink

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