

# **FISITA 2008**

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**Title:** Failure mechanism analysis bridging improved test and reliability strategies - safeguarding the future?

**Key Words:** automotive, failure mechanism, lifetime prediction, physics of failure, powertrain, qualification, reliability, virtual qualification

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**Abstract for the presentation:**

"There is no product, that touches more the people, which arouses more emotions, than an automobile" [1].

The automotive industry enthused one more again on the latest International Motor Show (IAA) with highest innovative products. And the impact is reflected by the huge effort inside research and development for strengthen innovation.

Mainly the areas of safety, powertrain, comfort and networked vehicle are speeding up to complex and electronically controlled systems. Additional the permanent growing requirements ask for complex systems consisting of electronics, mechanic and software within development cycles getting shorter and shorter. These systems have to survive long-term operation in a harsh environment, where humidity, vibration and, most of all, high temperatures will impact reliability. On top of that, temperature and lifetime requirements are increasing.

The current development time for electronic control units is about 2-3 years. One task for the long period is the qualification time, by today it takes about 6 months. Due to the fact, that there is a demand for extended warranty but also a call for decreasing development time of automotive electronics new approaches and methods are required to decrease qualification time. Understanding about failure mechanism is one essential topic for questions regarding accelerated test methods, lifetime prediction and decreasing testing time.

This implies actions needed for covering these challenges for the establishment of overlapping test and reliability strategies for system-, ECU-, board- and component level. Out of this one vision can be a global networking between suppliers and OEM in automotive industry to go one step in the "virtual qualification"-direction.

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[1] *excerpt:* Matthias Wissmann, president of the association of the automotive industry (VDA), IAA 2007 in Frankfurt.