

THE OMNICON®

R E P O R T

Published by The Omnicon Group, Inc. www.OmniconGroup.com

Fall 2008

New Software Analysis Program Reduces "Sneaky" System Anomalies

Omnicon's automated approach makes sophisticated sneak analysis economically feasible for every system

What are "Sneak Conditions"?

Sailors and flyers during World War II had their own name for it. Imaginary little monsters called "gremlins" were widely held responsible for unexplained shipboard and aircraft malfunctions. The idea of gremlins became so popular that they found their way into wartime books, as well as Warner Brothers and Disney cartoons.

In modern electronic parlance, "sneak conditions" are anomalies in either hardware or software that randomly cause undesired events, or inhibit desired ones from occurring. Examples might include unintended vehicle acceleration, loss of flight control on an aircraft, train doors that open on the wrong side, an inadvertent missile launch, or hazardingly misleading instrument readings.

What are Their Consequences?

Sneak conditions are not caused by component failures. They are inherent to the system design and characterized by their own random nature and ability to escape detection, even during the most rigorous of standardized system tests. At minimum, an undetected, uncorrected sneak in a control system will most certainly cause improper operation and lead to a reduction in system availability. In critical situations they may result in damage to, or even loss of the equipment or system, and sneak conditions hold the potential of causing injury or death to personnel, along with severe financial consequences.

The Virtues and Economics of Sneak Circuit Analysis

Sneak Circuit Analysis is not a new idea. In fact, it goes back to the late 1960s when it was initially developed by NASA as a means of verifying the integrity and functionality of their electronic systems. Omnicon has been performing Sneak Circuit Analyses for its Aerospace and Transportation customers for more than 20 years, as a means of uncovering potentially harmful and dangerous anomalies. Typically used to examine electronic hardware, the methodology may be applied to software as well. It is, however, a very manual-labor-intensive, costly

undertaking. Consequently, it is often reserved only for the development of systems that are highly critical in nature, and supported by very large budgets.



"Okay! Okay! Maybe investing in a sneak circuit analysis for the controller might have been worthwhile!"

While no one would question the value of Sneak Analysis, there are many safety-critical, mission-critical and revenue-critical systems that are denied its benefits simply because the high costs cannot be economically justified. With the advent of Omnicon's new Sneak Circuit Analysis Program, however, the economic barrier has been lowered appreciably.

Recognizing the significant benefits Sneak Analysis offers, in terms of reduced risk and enhanced performance and safety, a team of analysis experts and talented software engineers at The Omnicon Group set out to make it more widely affordable. Their efforts resulted in the development of a new software tool that automates the process and reduces its cost to the point where it can be

justified for virtually all critical systems.

According to Omnicon President Scott Abrams, "Our goal in developing the tool was put the cost of the Sneak Analysis on par with conducting a Failure Modes, Effects and Criticality Analysis on the same system."

Karen Frank, the company's Director of Business Development, expands on this by pointing out the differences that make the product so revolutionary. "Although there are a few automated tools that claim to handle sneak circuit analysis," she states, "none offer the versatility, flexibility, automation and robust analysis methodology that Omnicon's analysis tool provides."

Low-cost Analysis Yields Impressive Results

Currently, this software tool is generating a savings around 75% to 80% when compared to traditional Sneak Circuit Analysis methodologies. Perhaps just as significant is the new tool's ability to deliver results in a quarter of the time experienced with prior analysis techniques.

In the absence of Sneak Circuit Analysis, the only recourse is to wait for a sneak condition to occur and then address its impact on system availability and performance or resulting hazards. Considering that the nature of the consequences cannot be anticipated, this can easily represent an unacceptable level of risk...especially as the cost of analysis goes down.

The gremlins of World War II were undoubtedly the result of an engineering model that emphasized fast, cheap development and minimal testing in response to an unprecedented need for materiel to support the war effort. This is not true today. "With high cost no longer acting as an economic barrier," Scott Abrams asks, "can any manufacturer afford the risk of not performing a Sneak Analysis on their critical systems?" ■

Omnicon Exhibits and Presents at the 55th Annual Reliability and Maintainability Symposium

On January 26-29, 2009, RAMS will be held at The Worthington, A Renaissance Hotel, in Fort Worth, Texas. This year the theme of the conference is "Reliability as a Competitive Advantage – From Theory to Practice." Omnicon will be an exhibitor and a presenter at this unique and informative event.

Nat Ozarin, Senior Reliability and Safety Engineer, will be presenting a paper entitled "Applying Software Failure Modes and Effects Analysis to Interface Designs." Mark Saglimbene, Director of Reliability, Maintainability and Safety Engineering, will be presenting a paper entitled "Reliability Analysis Techniques and How They Relate to Aircraft Certification." For additional information visit www.rams.org.

Our Business Development team is currently scheduling appointments with companies that are interested in obtaining additional information on how Omnicon can work with them

in achieving their RM&S goals. To arrange for a meeting with our engineering representatives, contact Karen Frank at kfrank@omnicongroup.com. ■

Omnicon Engineers Work to Enhance Safety Practices

Designated engineers at The Omnicon Group regularly participate in related industry committees to provide knowledge transfer and remain up to date on the latest engineering developments. As an active member of SAE International's S-18 Aircraft Safety Assessment Committee, we felt it would be helpful to summarize its latest activities. The SAE international S-18 charter is to support effective safety management by developing and maintaining recommended practices for accomplishing initial design and in-service safety assessment of aircraft, as well as related systems and equipment. The two documents currently being updated are ARP4754 and ARP4761.

The most significant change to ARP4754 is a revision to the development assurance level assignment. The original ARP4754 had one Development Assurance Level (DAL) the new version breaks this into two DAL's:

1. DEVELOPMENT ASSURANCE LEVEL (DvAL)
2. DESIGN ASSURANCE LEVEL (DsAL)

The reasons behind the change include the difficulties encountered in understanding and applying the original DAL, and the fact that the subject systems have become more integrated and less federated. The new version of ARP4761 has updated the Markov Analysis (Appendix F) and added a Preliminary Aircraft Safety Assessment (PASA) to Appendix B (Preliminary System Safety Assessment (PSSA)). These documents are still being revised with their release anticipated in 2009. For information go to www.sae.org. ■

FIRST CLASS
U.S. POSTAGE
PAID
PERMIT NO. 14
HUNTINGTON, NY

The Omnicon Group
40 Arkay Drive
Hauppauge, NY 11788 USA
(631) 436-7918
www.omnicongroup.com



The Omnicon Group is an award-winning engineering company specializing in software, systems, reliability, maintainability, safety and test equipment engineering.

Visit us at the
55th Annual Reliability and Maintainability Symposium
January 26-29, 2009 • Fort Worth, TX
"Reliability as a Competitive Advantage - From Theory to Practice"
www.rams.org