

Human Error

As system safety engineers we often have to consider the human contribution to the safety of our systems. This encompasses the systems' operators, maintainers, and potentially others. Our pertinent analyses include Q&SHA and FTA.

Human errors include Errors Of Omission (EOD), Errors Of Commission (EOC), and Cognitive Task Errors (CTE). We know the ROM of the probabilities of these errors. We recognize that the best type of data is field data (i.e., incident rates) but this data is rarely available. We understand the causes of human error. This said, this does not make us Human Factors Engineers (HFEs).

Some HFEs are experienced in Human Reliability Assessment (HRA). There are 3 papers by B. Kirwan covering "The Validation of Three Human Reliability Quantification Techniques—THERP, HEART and JHEDI". (THERP—Technique of Human Error Rate Prediction, HEART—Human Error Assessment and Reduction Technique, JHEDI—Justification of Human Error Data Information) The first paper introduced the need for validation, the techniques themselves and pertinent validation issues. The second paper details the results of an extensive independent validation experiment. The third paper deals with the detailed investigation of the empirical validity of three techniques.

Depending on the situation, we may interface with HFEs on our projects, although in many cases we do not have this luxury. What can we do in the absence of THERP, HEART, JHEDI, etc., HFEs and field data? See the September newsletter!

System Safety Engineers

There is considerable variance in the knowledge and competency of those who we refer to as "system safety engineers". This variance includes educational background, number of years of experience, safety management experience, safety analysis experience, sector-specific experience, knowledge of system safety-related disciplines, software safety experience, and design experience.

Experience can include SMP, SSPP, HAZOP, hazard logs, PHL, PHA, SSHA, SHA, Q&SHA, FHA, PSSA, SSA, CCA, FTA, FMEA, FMECA, safety cases, DALs, SILs, SCCs to name a few. Knowledge of standards can include SAE ARP4754/4761, MIL-STD-882, DO-56, IEC 61508, RTCA DO-178, DO-254, etc. This is by no means the end of the list. Aspects related to software safety, for example, increase the length of this list substantially. How about "hardware" safety? Hardware means much more the electrical and electronic elements!

One quickly comprehends the potential breadth and depth of knowledge and experience that these individuals possess. The value of system safety engineers increases with these two parameters and it is not unusual for these people to be well respected by their employers forming part of the organization's infrastructure. Industry should respect these people, nurture them, reward them, and encourage their continued growth. We do.

Much More Coming

Look for much more in the newsletters to follow. This being the 3rd, we have barely scratched the surface.

Feedback

From Sikorsky Aircraft

I agree with your newsletter explanation of "SMP/SSPP", but would like to add a few comments. In my experience, a System Safety Management Plan (SSMP) is normally written by US Army customers to define Risk Assessment Codes (RAC), to include hazard severity level descriptions and probability of occurrence requirements. The SSMP also addresses Design/Development Assurance Levels, as well as regulatory references, publications and directives that the customer has imposed.

When an SSMP is provided, the SSPP wraps the SSMP and the contractor's own Safety Management Plan (SMP) into a single document, tailored to the specific contract.

The SSPP is also where the customer's Statement of Operation Intent (SOI) and other related safety and operational requirements/guidance from the SOW and DID are formalized and molded into a single viable guide for System Safety Engineering design and certification requirements.

Keep up the good work.

ISSC 2008 Conference

This event is taking place August 25-29 in Vancouver. For further information, visit www.system-safety.org/~issc2008/. Be sure to enjoy west coast salmon while you are there!

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