Insights

Breaking Down the Silos:

Can an integrated human factors and systems assurance approach result in better project outcomes?

In Acmena's first ever podcast, Principal Human Factors Consultant, Stephanie Cynk, Sue Milner (Human Factors) and Katherine Eastaughffe (Systems Assurance) discuss the challenges and benefits of integrating human factors and safety assurance programs in major projects to deliver successful outcomes.

Transcript:

SC: "Hi. I'm Stephanie Cynk, Head of Discipline for human factors and principal consultant for Acmena. I'm joined today by Sue Milner and Dr Katherine Eastaughffe who are directors and principal consultants for Acmena also.

Sue is a human systems engineer, a chartered engineer of the Institute of Engineering and Technology in the UK and a certified professional ergonomist with the Human Factors and Ergonomics Society of Australia.

Katherine is a systems and safety engineer and a fellow of Engineers Australia. They both have strong engineering backgrounds and between

them have over sixty years of experience. In this recording we will be discussing the challenges we often experience when integrating human factors with safety assurance in projects and how we can overcome these challenges for a successful project outcome.

So, Sue, based on your experience, what is the relationship between safety assurance and human factors?"

SM: "Well, Stephanie, the human factors and safety disciplines are very similar in many ways and they face the same challenges in a project.

They are both examples of systems thinking where people are necessarily part of the system of interest."

KE: "And by systems thinking, we mean that holistic, helicopter view of the world and thinking about things in a broad perspective to gain that overall picture, rather than immediately narrowing down and focusing on the detail and technology of the system of interest.

Asking and answering questions of how is the system going to operate in practice, what are the key objectives of the system and project and who are the people interacting with the system."

SM: "Yes, that's right, and going back to similarities between human factors and safety assurance they are often both seen as peripheral activities to the main engineering and design tasks of the project.

And because they are seen as peripheral, that often means that they start later in the project itself.

I guess I speak for both of us, Katherine, when I say that they shouldn't be viewed this way. They need to start early to get any benefit and in particular when key design decisions are being made to ensure that the right inputs are provided to the whole design making process.

There are differences though. Safety is an emergent property of what we're building whereas human factors is the specific application of expertise, tools and techniques.

Human factors contributes not only to the safety of a system, but it also contributes to other system properties such as overall performance and resilience. These are some of the many different dimensions of any project."

KE: "Sue, you mentioned the emergent properties of a system and it's worth talking about what that means. It refers to something that occurs in complex systems, something that can't be planned for or seen when you look at the component parts of a system.

It only becomes apparent when things are plugged together and interact. For example, safety is a property that emerges from the interaction of people with technology. How people interact with the system, how the system has been designed for that interaction makes a difference to the likelihood of safety incidence, making them higher or lower.

People are always involved in that incident sequence of events and are often the last line of defence. What that means is, to have a good safety case and a good safety engineering process, human factors has to be considered. You can only make a safety argument about a system if you consider that human interaction and think of the user inside the system boundary."

SC: "How can safety engineers and human factors specialists better support each other?"

SM: "That's a very good question. There's actually a lot of overlap in what we do. For example, one of the things we both do is to understand the system boundary and its context. That's really considered more of a systems engineering task, but it's frequently omitted from a project, so when we need it, we need to step up and fill the gap.

This is something that can be done once by either discipline and used by the other. And also a human factors specialist will be interested in whether there's any human interaction with the system and if so where the touch points are. This actually supplements the context and again, once done, it can support the whole of the project to avoid any duplication of effort."

KE: "And another example is operating and support hazard analysis. This is analysis done to identify and consider the hazards related to the tasks of operating and maintaining assets. It typically uses a task breakdown and it makes sense that the task breakdown could be the output of a task analysis that a human factors specialist has already done.

Safety engineers tend to be very focused on system assets and failures of the system equipment. But one of the important things in safety is having a complete understanding of causality, so having that equipment focus doesn't really provide the full picture.

Human factors people, coming from that users perspective, then becomes very valuable because it provides that complementary view point to completing the picture."

SM: "That's true, but I also think the success of a program needs the human factors and safety assurance specialists to be working together from the very start of the program. Planning how that

KE: "Human factors and safety assurance disciplines have similar challenges in projects particularly in relation to integrating with project teams so we can definitely support each other."

I think it's all too common to think about the human factors and safety aspects too late in the day after key decisions have already been made by the project. And then it becomes hard to wave a magic wand over those decisions if safety and human factors weren't inputs to the decision in the first place.

So, in our experience, successful programs have all disciplines, including safety assurance and human factors, working together right from the outset. This is definitely the best way to get the best out come for a project."

will happen and who's responsible for what aspects of the work, and when they need to confer, I believe is fundamental.

It's also important to think about the human factors outputs work together with the safety outputs and vice versa. For example, the human factors issues register and the hazard log – where are the human factors safety issues captured and how will they be transferred between the two? And similarly, with the human factors assurance report and the safety assurance report."

SC: "You're both directors of a company that offers the integration of human factors and safety assurance, what do you think are the benefits that brings?"

SM: "That's true. We actually need to make sure disciplines don't work in siloes. Communication of key information and design decisions is very important.

And that goes for any discipline, whether it's human factors, safety or others. This is why INCOSE, which is the International Council on Systems Engineering, has started calling systems engineering a trans-disciplinary activity.

They recognise that systems engineering, which includes safety assurance and human factors, is

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the glue which facilitates bringing disciplines together and integrating them. Systems thinking, which we have spoken about before, is actually common across all three of these disciplines."

SC: "So what you're saying is that human factors and safety assurance programs need to start early to provide benefit and that it's more efficient in terms of project delivery and avoids duplication of effort?"

KE: "That's right and working together will deliver a consistent story or narrative and as a result a much better safety argument."

SC: "Thank you both and thank you for listening to our Insights. If you'd like to find out more about the integrated approach Acmena offers, please visit our website – www.acmena.com.au"

Profiles

Katherine Eastaughffe
Principal Consultant & Director

Katherine is a recognised authority in engineering safety management, specialising in reliability, quality and integrity, with over 23 years' experience in the rail industry. She is currently Systems & Safety Assurance Manager for the Cross River Rail RIS Package.

Sue Milner
Principal Consultant & Director

Sue is a highly accomplished Chartered human systems Engineer and certified professional ergonomist with a breadth of experience in the specification, design, evaluation and delivery of high-integrity systems. Her project work includes Sydney Metro and ATMS Advanced Train Management.

Stephanie Cynk
Principal Consultant

Stephanie is a chartered human factors professional with over 14 years' experience in the rail and transport sectors. Specialising in physical and congnitive ergonomics, her project work has included the Digital Systems Program, System Integrator and Sydney Trains Metro Integration.

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