From frontline NHS to frontline Afghanistan: transferring skills to defuse conflict

Understanding the issues and tackling the problem

PSYCHOMETRICS IN ERGONOMICS: MEASUREMENT OF THE MIND
Reliability, variance and standardisation

HEALTHCARE TECHNOLOGY CHALLENGES FOR TINY USERS
A HUMAN FACTORS APPROACH TO MENTAL HEALTH IN THE WORKPLACE
Editorial

Keeping calm in difficult times

Arguably one of the most fascinating and demanding areas of our discipline is dealing with the requirements of the particular users who will interact with the system, product or environment that we are working on. One such example is given in the article on healthcare technology developments for resuscitation of newborn babies.

Measurement of the mind, a seemingly impossible task, is discussed with respect to psychometric testing in Bob Bridger’s article on questionnaire design, whilst a human factors approach to supporting mental health problems in the workplace is outlined by Louise Pode.

At a time when the Malaysia Airlines flight MH370 has still not been accounted for and speculation remains rife over its fate, the relatives of the passengers are becoming increasingly angry at the Malaysian government’s account of events. With increasing conflict on the ground, defusing the tension is going to be a difficult process.

This topic is discussed in our main feature article by Ryan Meeks on research into how staff in places such as hospitals and prisons deal with conflict management and violence prevention, in order to identify whether such techniques could be used in a military context.

As Ryan says: “When we think about a police officer arresting an armed civilian or a nurse calming a violent patient, it’s clear that these people possess a relevant set of competences that could also benefit military personnel in an insider attack situation.”

If you have any ideas for feature articles on research or practice of ergonomics and human factors, news items, details of relevant events and new suggestions for content for The Ergonomist, please email us.

Tina, email tina@ergonomics.org.uk
Frances, email frances@ergonomics.org.uk
Times of change and more to come

Now is the time to say goodbye. Now is the time to heave a sigh. Don’t worry – I am not about to break into song. In a few weeks as I write this, and possibly before you have read it, I will be handing over the reins of power to Roger Haslam. It has been a great honour to have been at the head of the oldest and one of the largest professional societies for ergonomists in the world. It’s easy to lose sight of this heritage, although the sad death of two prominent ergonomists from earlier times (Peter Davis and Duncan Troup, both of whom I had the pleasure of knowing) served to make me aware of the long history of what is now the IEHF, and all that has happened over the years in the progression from the Ergonomics Research Society to the present day.

I have been fortunate to have had a long and very interesting and enjoyable career in ergonomics (which isn’t over yet I am pleased to say) and one of the highlights of my term was the day spent last year at the Ergonomics Careers Day, hearing a number of ergonomists (several of whom were just starting out) talking with such enthusiasm about their chosen career.

You will have heard and read a lot over the last few years about Chartership and I don’t want to tempt fate over this but hopefully it’s something you will be hearing even more about in the year to come. It really is an exciting prospect and one that, in many quarters, will serve to demonstrate that ergonomics has arrived and is a credible and important influence and profession.

I was talking very recently to the former President of another UK professional society and he was saying that Chartership has been of great significance for them, not just in the UK but overseas as well (particularly in the Commonwealth countries). I had hoped that it would come to fruition ‘on my watch’ but these things take time, and not a little effort (for which particular thanks go to our CE Dave O’Neill and Registrar Alan Ferris who have borne the brunt of this).

The last few years have been challenging, with the difficult financial situation in the UK and much of the rest of the world. We have seen a lot of challenges in the IEHF as well with major changes amongst the office staff. I would like to extend my thanks to all those who have moved on – and to those who have stuck with us – and my welcome to those who have joined us. Although there is still work to be done I think that we are moving towards stronger and more effective and efficient times.

Finally I would like to extend my thanks to you, the members. You have proved to be more loyal than many of your counterparts in other countries. Hopefully we can continue to grow and develop the IEHF to justify that loyalty and, with your support, to continue to make more people aware of ergonomics and this profession of ours. Good luck – and goodbye.
Psychometrics in ergonomics: measurement of the mind

Robert S Bridger

Questionnaires are used to gather information from users across a wide range of topics, from the assessment of physical and psychosocial stress at work to the usability of consumer products. They are a practical way to consult users or employees, asking everyone the same questions in the same order. Basic training in questionnaire design tends to focus on the ergonomics of questionnaire design, which is concerned with making sure that the response boxes line up with the items and that leading or double-barrelled questions such as “Are badly designed cell phones difficult to use or do you prefer tablets?” are avoided.

Unlike physical measurements, where we can see what we are measuring, questionnaires are often used to measure states of mind that are not directly observable. This lack of visibility introduces the problem of circularity, that is, if it’s not observable, how do you know it’s there? If you hadn’t asked users, would they ever have thought about it in the first place? Scientific reviewers may well ask:

› Do these constructs exist independently of the questionnaire?
› Can the questionnaire measure them?
› Can the questionnaire measure them reliably?
› Are they worth measuring?

Psychometric methods, originally developed by psychologists to measure personality and intelligence, can help. A user-centred approach to questionnaire design is recommended to ensure that the items being assessed are more than just artefacts of the instrument used to measure them.

Psychometrics

The classical approach to questionnaire design in psychology consists of a number of stages: generate items for the questionnaire using focus groups, theory or the opinions of subject matter experts; develop a pilot questionnaire and test it using a sample from the target population; use data reduction techniques to identify the underlying constructs in the domain; group the items into sections and identify those that are most representative of different constructs, then construct summative scales, and finally the validate the questionnaire.

Designing questionnaires

Suppose we want to investigate the ergonomics of mobile phone design by means of a questionnaire. Modern mobile phones are complex and are used for a variety of purposes. There are many variables, so how do we identify the important ones? Where do we start? Answer: we find a valid and reliable questionnaire designed by somebody else and use that. But suppose there isn’t one?

Well, we could start with a literature review then conduct some focus groups or structured interviews, talk to retailers about the popularity of features and/or feedback they receive from customers, and we could develop a pilot questionnaire of, say 50 items with 5-point Likert scales to capture responses (for example, 1=’Strongly Disagree’ and 5=’Strongly Agree’). The pilot questionnaire could be sent to, say 300 people. However, when those questionnaires come back, it isn’t sensible or useful to look at every individual response to each of the 50 questions. Therefore, the responses need to be analysed to discover if there is any covariance between them and, if so, what that covariance tells us about mobile phone design.

Covariance

Covariance is a way of describing the relationship between items in the questionnaire. It can be determined by performing a Principal Component Analysis (PCA), which will group the items depending on the level of covariance between them.

For example, a PCA on the responses to the mobile phone questionnaire may reveal that these three items: “I needed to look at the manual when using this phone”; “I learned how to use this phone quickly”; “I often need to ask for help in using this phone”, covary. A look at the questionnaires reveals that those who agreed they had to look at the manual, disagreed that...
they learned how to use the phone quickly, that is, people who tend to agree with the first item, tend to disagree with the second. Thus, there is a relationship between them.

The next task is to name the relationship using a construct. The three items mentioned can be grouped under a construct entitled ‘learnability’ as they all deal with how easy or difficult it is to learn how to use the phone.

The other items of the questionnaire may load onto other constructs such as ‘style and appearance’ or ‘usability’.

Once it has been determined which items measure which constructs it is then possible to shorten the questionnaire by choosing the items that best measure each construct. This choice is made by calculating ‘Cronbach’s Alpha’ which indicates how well each of the items within a construct correlate with each other. The higher the Alpha value, the stronger the correlation. If, for example, there are nine items that measure ‘usability’, it may be possible to reduce these items to five by determining which five items give the highest Alpha value.

These five items can then create a ‘usability scale’ within the questionnaire, with the answer to each item given a score. The scores from each item can be added together to give a composite usability score. The same can be done for all of the constructs, allowing the questionnaire to measure different dimensions of mobile phone design and making it possible to compare those dimensions across different phones.

The composite score for each dimension gives a useful summary of the data collected by questionnaire, reduces measurement error and makes carrying out statistical analysis on the data much more straightforward.

**Reliability**

If a questionnaire provides the same results every time it is used under the same conditions, then it is reliable. The reliability of a questionnaire is not the same as the stability of the construct it measures, so questionnaire designers have to decide on the time period over which they expect the underlying construct to be stable in order to find out if the questionnaire is reliable. So, for the mobile phone example, we might expect that users’ perceptions of phones to remain stable over a week or a month but not over years, as expectations change with the emergence of new products.

The simplest way to measure reliability is to determine test-retest reliability by having the same group of people fill in the same questionnaire at two different times. The drawback of this method is that there may be confounding effects such as sensitisation of participants to the issues highlighted in the questionnaire.

**Validity and standardisation**

A questionnaire is valid if it measures what it is supposed to measure. Two types of validity are discriminant validity and criterion validity. Discriminant validity refers to the ability of a questionnaire to differentiate user responses to different products or to differentiate the responses of different user groups to the same product. A questionnaire with high criterion validity would be valid in the sense that users’ responses relate to some criterion measure of use. The criterion might be an affective state, such as satisfaction, or an intention, such as the intention to change phones in the next six months.

Good psychometrics is the backbone of questionnaire design and is usually a requirement of scientific review committees and of editorial boards of journals when research protocols and papers are reviewed. In practice, psychometric techniques can be very useful in making complex datasets easier to analyse and interpret and, by exposing the underlying structure, they can give us new insights into what the questionnaire is really measuring.

As with physical anthropometrics, sometimes we need data on single variables such as stature or legibility of screens and psychometric reduction is not needed. However, when it comes to asking more general, or even vague questions such as “Is the population changing in some way?” or “How do people think about their phones these days?”, the psychometric approach to handling complex databases can be very useful.
The following papers have been published in volume 57(2) of the journal Ergonomics.

**Office design’s impact on sick leave rates.** The results of a prospective study of the office environment’s effect on employees indicate differences between office types, depending on the number of people sharing workspace and the opportunity to exert personal control as influenced by the features that define the office types. C B Danielsson, H Singh Chungkham, C Wulff & H Westerlund, pp139-147.

**Good ergonomics and team diversity reduce absenteeism and errors in car manufacturing.** The ageing workforce is considered as productivity risk in manufacturing industries. This study shows that high physical workloads and homogeneous team composition are both associated with higher absenteeism and error rates. L Fritzche, J Wegge, M Schmauder, M Kliegel & K H Schmidt, pp148-161.

**The influence of task variation on manifestation of fatigue is ambiguous – a literature review.** Some laboratory-controlled studies showed some positive effects of increasing temporal variation, providing limited support for introducing frequent interruptions in work. Activity variation showed ambiguous effects. In practice, however, other positive effects of activity variation may occur, for example job enrichment and increased motivation. T Lugier, T Bosch, D Veeger & M de Loose, pp162-174.

**Counteracting skill decay: four refresher interventions and their effect on skill and knowledge retention in a simulated process control task.** Skill and knowledge decay of operators and its consequences have not been investigated intensively. The results of two experiments show that skill and knowledge decay can be attenuated and even avoided by refresher interventions. A Kluge & B Frank, pp175-190.

**Exploring schema-driven differences in situation awareness between road users: an on-road study of driver, cyclist and motorcyclist situation awareness.** This study examined situation awareness in drivers, motorcyclists and cyclists. The findings are used to propose interventions designed to enhance the compatibility of situation awareness between road users. P M Salmon, M G Lenne, G H Walker, N A Stanton & A Filtness, pp191-209.

**Effects of hyperbaric nitrogen-induced narcosis on response-selection processes.** Subjects performed a RT task in which response-selection processes were explicitly manipulated. The ‘compatibility’ effect was modified by inert gas narcosis compared with a control condition: response-selection processes are among the loci involved in the effect of inert gas narcosis on information processing. C Meckler, J E Blatteau, T Hasbroucq, B Schmid, J J Risso & F Vidal, pp210-218.

**Identification of technique variations among microvascular surgeons and cases using hierarchical task analysis.** A hierarchical taxonomy, created from a hierarchical task analysis and work attributes, was applied to describe technique variations among microsurgery cases. Variations in time, frequency and sequence were used to form hypotheses on best methods for standardising procedures. D Yu, R M Minter, T J Armstrong, A C Frischknecht, C Green & S J Kasten, pp219-235.

**The influence of precision requirements and cognitive challenges on upper extremity joint reaction forces, moments and muscle force estimates during prolonged repetitive lifting.** Precision placement during prolonged repetitive lifting increases upper extremity forces and moments, while the addition of a cognitive task is benign. Field assessments of repetitive lifting should include observations longer than 10 minutes. C Joseph, T A C Beach, J P Callaghan & C R Dickerson, pp236-246.

**Validity of the Acti4 software using ActiGraph GT3X+ accelerometer for recording of arm and upper body inclination in simulated work tasks.** Being inexpensive, water-resistant and without wires, ActiGraph GT3X+ seems to be a valid means for direct long-term field measurements of arm and trunk inclinations. M Korshaj, J H Skotte, C S Christiansen, P Mortensen, J Kristiansen, C Hanisch, J Ingebrigtsen & A Holtermann, pp247-253.

**How does the way a weight is carried affect spinal loads?** The loads on a telemeterised VBR were measured in five patients carrying weights in different ways. Holding a weight in front of the body strongly increased the force, while carrying it in a backpack led to only a minor load increase. A Rohlmann, T Zander, F Graichen, H Schmidt & G Bergmann, pp262-270.

**Layering garments during rest and exercise in the cold (8°C): wearer responses and comparability with selected fabric properties.** We examined the way in which selected fibre, fabric and garment (layering) characteristics contribute to performance of the clothing system under cold conditions. Selected properties of the constituent fabrics were found to provide limited insight into how garments perform during wear under the conditions of this study. B A MacRae, R M Laing, C A Wilson & B E Niven, pp271-281.
Early recognition of the effects of excesses of work

Sir William Mather, a British industrialist, introduced the 48 hour working week in 1892 in his engineering factory, Mather and Platt, in Manchester. It was through him that factories did not start work before 8 o’clock in the morning. This became law in the early 1900s.

Sir William was a Liberal politician who sat in the House of Commons between 1885 and 1904. He became MP for Salford and made many speeches regarding the needs of the worker which connect with ergonomics thinking today. He said:

“We employers cannot disregard the almost universal determination of working men to preserve their bodily powers and skills for as long a period as possible throughout life, since they form their only capital.

In the course of nature this capital diminishes as the years increase. It may be exhausted in twenty years of excessive strain, or still be available after forty years of earnest daily work.

The combinations of working men are in duty bound to preserve this capital and if customs prevail which exhaust it wastefully, leaving men prematurely broken and discrepid in body and mind, to be cared for by their fellows or society, we are living under unnatural conditions.”

Thanks to Sheila Lee for this item.

Google uses balloons to provide WiFi connectivity

Two-thirds of the world’s population does not have access to the internet. In an attempt to help rectify this inequality, Google launched Project Loon in New Zealand last June.

Project Loon is described by Google as “a network of balloons travelling at the edge of space designed to connect people in rural and remote areas, help fill coverage gaps, and bring people back online after disasters”.

The balloons travel in the stratosphere and rise and descend in order to catch an air current that will send them in the right direction. Antennae attached to buildings allow people to connect to the internet using the balloons.

The project could potentially have other benefits, with climate scientists asking to use the balloons to monitor the stratosphere to detect climate change indicators.

For more on the story see www.google.com/loon.

Apple iOS7.1 upgrades demonstrate need to balance style with usability

Apple responded remarkably quickly to complaints that design features on the iOS7.1, such as parallax effects, zooms and slide animations were causing some users to experience motion sickness and vertigo.

Only a month after these complaints became public Apple issued a ‘Reduce Motion’ upgrade that replaced most zoom effects with crossfades. Affected users responded very positively to the upgrade and were impressed with the fast and effective fix.

Another accessibility upgrade, ‘Button Shapes’, increases the affordances of the phone’s buttons. Affordances are the clues buttons give as to how they should be used.

Usability experts have argued that while it is welcome, such an improvement should not be part of an accessibility upgrade but part of the standard design.

Affordances make an interface more intuitive and easier to use, something that all users would appreciate. Therefore, they argue, rather than being part of an upgrade, ‘hidden’ in accessibility settings, it should be part of the default design.

The need for the upgrades has indicated a tendency to sacrifice usability for aesthetics in the original design. However, the effectiveness of the upgrades, and the speed at which they were delivered have demonstrate Apple’s willingness to listen to users and to iterate and improve the design on an ongoing basis.

New health and safety app secures funding

RNF Digital, a company based in Warwickshire, has been awarded a £100k grant by the Technology Strategy Board to develop a health and safety app that they claim “has the capacity to revolutionise the way companies fulfil their health and safety obligations”.

The app will allow those responsible for health and safety in companies to fill in real-time intelligent forms that are fully compliant with health and safety legislation, then upload the forms to the cloud.

The aim is to help to reduce the amount of time spent on data collection and reporting, and to allow all employees in a company instant access to health and safety information.

The grant will allow RNF Digital to carry out an initial feasibility study and do basic prototyping and specialist testing of the new app.
Healthcare technology challenges for tiny users

John Crowe, Alexandra Lang & Don Sharkey

Instruments for monitoring physiological functions such as heart and breathing rates, temperature and blood pressure are now widely and cheaply available. Consequently, it is rare that the opportunity arises to consider the ergonomics of a new physiological monitor. However, this opportunity did arise in a collaborative project between the Faculty of Engineering and the Department of Child Health at the University of Nottingham.

The team are developing an optical based sensor, named HeartLight, that can record the cardiac synchronous variations in blood volume, that is, the pulse, from which heart rate can be calculated.

The monitor is to be used during the resuscitation of newborn infants, necessary in 10% of births. The aim is to remove the need for practitioners to suspend the resuscitation process in order to manually measure the baby’s heart rate by counting the beats whilst listening with a stethoscope. It also aims to reduce the risk of errors that are known to occur during manual counting.

The capture of user requirements in this project was essential to the development of the instrumentation. Therefore, the collaboration of human factors academics, clinical consultants and research nurses was vital to the iterative process around which the heart monitor was developed.

The ergonomic requirements of this sensor are twofold. First, the design of the sensor and its attachment mechanism and second, how the calculated heart rate is relayed to the practitioner. Sensor placement must fit within clinical practice that involves placing the premature baby in a polythene wrap/bag and putting a hat on them to avoid hypothermia. The sensor requires contact with the surface of the skin on an area where it is thin enough for the fluctuations in blood volume to be measured. Studies demonstrated that the sensor placement on the forehead obtained reliable results within these parameters. This fact presented a viable solution for attachment of the device. By placing the sensor under the hat against the forehead it presented an optimal position for monitoring. Another benefit of this placement was that the sensor would be unlikely to be dislodged during the resuscitation process.

The scale of technology for use with neonates is another significant consideration. Engineers working on this project have had to consider the specialist requirements and critical time pressures of a resuscitation environment; multiple sensors and alarms, medical devices and hardware with wiring, in addition the need for practitioners to carry out the resuscitation process on a small baby. Technology requirements therefore have to be developed for both the adult clinical user and the tiny patient.

The display of heart rate measures raises more questions. Should the output be visual or audible? What format should this take? Do less experienced clinical staff need more information? What if more than one practitioner is in attendance and how do they share the workload and processing of this information? What accuracy is needed for the
information to be effective in this high-pressure environment?

These issues have proven interesting to investigate since it encompasses the resolution of the output value and the rate of update. The requirements of neonatologists, environmental considerations and quality and quantity of information that they work with provides a complex backdrop to these issues.

This research project is ongoing. Not only do the practical issues of carrying out development and testing of a new device provide challenges to the team, but the additional complications of working with babies and their families and the sensitivity required in emergency scenarios, such as resuscitation, is a significant facet of the work being carried out.

Despite these challenges, the expectations of the device within clinical practice and survival rates for neonates are high. The inclusion of ergonomics from the start of the process has made the eventual roll out of this device more feasible due to the approaches taken early on in its development.

ABOUT THE AUTHORS
John Crowe is Professor of Biomedical Engineering in the Electrical Systems & Optics Research Division and Dr Alex Lang is a Research Fellow in the Human Factors Research Group, both working at the University of Nottingham. Dr Don Sharkey is a Clinical Associate Professor of Neonatal Medicine at the Queen’s Medical Centre in Nottingham.
Human factors now a key discipline in the nuclear industry

On a cloudy day in March, fifty of the UK’s nuclear human factors specialists gathered at the HSE premises in Bootle for the Nuclear Ergonomics Special Interest Group (NESIG) one day annual conference. The purpose was to share knowledge and to discuss key issues that challenge practitioners during the application of human factors techniques in the industry. The event was organised by Richard Simcock and the theme was “Where are we now and where are we going?”

Human Factors Engineer, Paul Traub (pictured centre left top) opened the event by discussing various HRA techniques and how they can be used together to derive human error probabilities. Making an interesting comparison with mixing your drinks, Paul discussed his experience with the use of various techniques such as HEART, THERP and Time Reliability Curves. He highlighted particular combinations of techniques that seem to provide appropriate, reasonable outcomes and used video clips to great effect to entertain and inform.

David Embrey (left middle) of Human Reliability Associates then compared the nuclear industry approach to human factors application with his current area of expertise, oil and gas. Discussing the different aspects of qualitative versus quantitative assessment, David suggested a potential lack of transparency of the type of work being undertaken in the nuclear industry. He went on to demonstrate the benefits of using software to model human errors, including a rating scale to help identify where intervention by ergonomists could be beneficial.

Jon Berman (left bottom), Director of Greenstreet Berman, led a thought-provoking discussion on resilient organisations and the potential for conflict between resilience and compliance. Discussion of how to prepare operators for the unexpected while heavily relying on procedural control was the main focus. He backed the move towards ‘Safety II’ and the need to examine what organisations are doing right while learning from incidents. The need for a shift from reducing to managing uncertainty and the factors that affect compliance were debated.

“Procedures Schmocedures” from Richard Simcock (centre right top) of Ergonomic Systems Ltd, looked at the natural use of procedures and their over-reliance in the workplace. Strongly challenging the guidance that demands the need to use step-by-step procedures for anything important or complex, he stated that we are not currently taking into account people’s strengths and capabilities by dictating the need for procedures in many circumstances where they might not improve human reliability. An interactive, informative presentation.

Mark Roberts (right middle) of Urenco ChemPlants, then gave the group a different viewpoint from outside of the human factors profession. An EC&I Engineer, Mark described how good alarm management can improve operator and plant efficiency and how to make a business case for the integration of human factors. He presented the alarm management process being undertaken on his project and summarised the results of detailed alarm rationalisation. He gave points of warning to the group and highlighted the successful implementation of a collaborative approach to alarm design.
The final presentation came from Jerry Williams (right bottom), a retired Nuclear Regulator, discussing both the achievements of the profession and looking to the future. He described how ergonomics had become a key discipline in the nuclear industry, making reference to Sizewell B and the influential research that has been undertaken. He highlighted a number of aspects that should be considered to improve our influence within the industry, such as providing cost arguments for human factors involvement and researching areas to better understand situational awareness and psychological error mechanisms.

There was plenty of opportunity for networking throughout the event, giving sufficient time to catch up with old friends, debate topics and to make new connections. A good lunch was provided, sponsored by the AREVA RMC Human Factors Team.

There was an open discussion asking for delegate feedback on the purpose and goals of the NESIG and how to take the Group forward. One of the aims of this session was to highlight to the group members the need for a group co-ordinator, or a steering committee of organisers, who would be able to expand the involvement of the SIG. Many expressed an interest in supporting the SIG and a co-ordinator, or team, will be identified in the near future.

The NESIG organisers would like to thank a number of groups. Firstly, the ONR for providing a venue for the day, and particularly to Ben McCaulder for his organisation, and Elaine Vinton for the opening address and warm welcome.

Thanks to all the speakers who did an excellent job of providing thought-provoking presentations. This event could not be run without them volunteering their time and ideas for their peers.

Thanks to Ned Hickling and Richard Simcock who ensured the event ran smoothly on the day by chairing the sessions and by being part of the organising committee that put the day together. Finally, to Clare Pollard, who did a wonderful job of keeping a close eye on the time (even if I do say so myself!).

Feedback was received from the delegates and will be reviewed in order to define the next steps for the Group. Well done to Jennie Brown from AREVA RMC for winning the raffle prize of an Ashgate Publishing book voucher.

To all NESIG members, please keep a watch for communications from the present steering committee in order to find volunteers to support future group activities to ensure the continued success of the NESIG.

Clare Pollard

Human Factors in Complex Systems

10-11 June 2014, Nottingham

This event, which is being held to celebrate the work and life of Professor John Wilson, will allow an international group of leading researchers and practitioners in ergonomics and human factors to present and discuss their work in what will be a lively two days with much discussion and debate.

We have been overwhelmed by the enthusiasm for this event, and have put together a wide-ranging programme that covers many of the areas of work that John’s research and practice focused on.

On the Tuesday, we cover systems ergonomics, ergonomics/human factors theory and practice, and rail human factors. Our speakers, who include Gudela Grote, Waldemar Karwowski, Leena Norroa, Paula Savioja, Klaus Zink, Peter Vink, Mark Young, Barry Kirwan, Steve Shorrock and Erik Hollnagel, will present their own perspectives on these topics, as well as participating in panels and discussions. We also have a number of contributions, particularly in the rail human factors area, from colleagues that John worked with in the past. We will end the first day with a series of workshops which will include some focused on rail.

On the second day we take some time in the morning to specifically consider John’s contribution to the field of human factors. Presenters, including Francois Daniellou, Pierre Falzon, Sarah Sharples, Pat Waterson, Roger Haslam, Jan Dul, Peter Buckle and Ken Parsons will consider John’s work in the international E/HF community, his work as an editor of Applied Ergonomics, his contributions in journal papers and his leadership of research activities at Nottingham. This will then be followed by two further sessions, on ergonomics/human factors theory and practice, with a particular focus on health, and finally a consideration of future challenges and areas of focus. Speakers will include Pascale Carayon, Peter Buckle, Colin Drury and Chris Baber.

Registration for the event is now open, and for details of this and all other aspects of the event, visit www.hf-complexsystems.org.uk. We do hope that many of you are able to join us for what will not only be a celebration of the work of someone who many of us knew and enjoyed working with, but also an opportunity for us to discuss some of the key topics in the areas of human factors in complex systems, that will provide a grounding for many of our future thoughts and ideas.

Professor Sarah Sharples will be giving her inaugural lecture the evening before this event on 9th June in Nottingham. More details are available on the event website above.
From frontline NHS to frontline Afghanistan: transferring skills to defuse conflict

Ryan Meeks

Based on actual events, August 2012.

Working closely with UK, US and other Coalition Force colleagues throughout his training, a newly recruited Afghan Local Police (ALP) Officer stands tall at his inauguration ceremony, now ready to proudly protect his nation against the persistent threat of insurgency, social unrest and political instability. He has formed close working and personal relationships with his International Security Assistance Force (ISAF) colleagues over the past weeks, who have taught him a range of military skills and have tried to instil in him a sense of honour and responsibility that is surely so vital to the nation’s continued recovery. Instead of taking on the mantle though, the ALP Officer receives his weapon and opens fire on his colleagues and mentors, his first act in his position of responsibility, leaving two dead. Although killed in the aftermath, he has already left a blood-stained mark on the effort to re-build Afghanistan.

Insider attacks

Insider attacks, also called ‘Green-on-Blue’ attacks, occur when a person in a position of trust within the ISAF and/or Afghan National Security Forces (ANSF) initiates an act of violence against their ISAF/ANSF colleagues. Such insider attacks are a continual threat to deployed personnel, including UK Forces, in Afghanistan. There have been over 90 recorded such incidents since 2008 and they accounted for 15% of all Coalition deaths in 2012. The problem is set to persist throughout 2014, as Coalition troops pull out of the country and transfer security responsibility over to the ANSF, and during the formation and support of the Afghan National Army Officer Academy in Kabul.

The Human Factors Group at Frazer-Nash Consultancy Ltd conducted research on behalf of the Defence Science and Technology Laboratory (DSTL) to tackle the problem. This research involved exploring how conflict resolution, conflict management and violence prevention methods are trained across a range of different organisations and industries in order to identify techniques, methods and strategies for training that could be exploited in the military context.

Understanding the problem

Insider attacks can have a complex mix of contributing socio-cultural, behavioural, organisational and political factors, making it difficult to understand and, therefore, to tackle this issue. Factors such as extremist radicalisation and tribal, cultural, personal and other religious differences may ultimately contribute to an insider attack occurring, presenting a spider web of challenges to overcome. This work aimed to define the complex nature of emerging and escalating insider attack threat incidents in order to equip personnel with simple and easy-to-use methods for dealing with face-to-face immediate threats.

Information was collated from unclassified open source web resources and an analysis was conducted of 93 incidents from July 2007 to September 2013. This analysis allowed the project team to paint a picture of this complex problem and provided valuable insights into challenges faced by personnel when face-to-face with the threat of an insider attack. Some of the most interesting findings include:

› The majority of insider attack incidents occur on joint/combined bases, mainly due to the increased levels of interaction between the ISAF and ANSF Forces.
Personal arguments, animosity and disputes precede many incidents based on interpersonal, cultural and/or social differences, which ultimately escalate into an attack.

Stress plays a major contributing, but little understood, role in insider attacks.

Attacks generally occur at small, more remote locations such as checkpoints and sentries, where perpetrators have more opportunity to conduct the attack and then escape.

Threats to the Afghan concepts of honour, respect and courage are influencers to insider attacks.

Establishing rapport, trust and positive interpersonal relationships between ISAF and ANSF personnel is essential to reduce the probability of insider attacks occurring.

Widening the net – learning from industry

We decided to tackle the problem in a novel way by exploring how a number of pan-industry organisations train people to deal with conflict and threat situations. It was found that insider attack incidents are often preceded by interpersonal conflict and dispute, and so the ability to de-escalate and defuse potentially dangerous intensifying conflict could be central to the solution.

People deal with conflict and threat in a number of roles and environments such as policing, the prison service, hospitals, customer service, peacekeeping organisations, security services and more. When we think about a police officer arresting an armed civilian or a nurse calming a violent patient, it’s clear that these people possess a relevant set of competences that could also benefit military personnel in an insider attack situation.

From a detailed literature review of cross-industry training solutions, engagement with subject matter experts and attendance at training courses, we developed a network of knowledge, skills and attributes (KSAs) that allow people to deal with conflict effectively. These KSAs revolved around the ability to ‘read’ other people in order to assess their level of stress and fear and to recognise the cultural and social factors that might contribute to conflict. Interpersonal skills such as the use of verbal and non-verbal cues and the ability to empathise and to create rapport and trust were important attributes of those who were able to defuse conflict. It was also necessary to be able apply a range of conflict resolution styles flexibly depending on the nature of the situation and to be aware of behavioural ‘red flags’ and social faux pas that could escalate conflict.

Simple and rapidly exploitable

The aim was to propose a solution that everyone in the field can easily pick up and use. The focus was on simple and easy-to-use methods already tried and tested in other organisations and industries that can be trained quickly and effectively.

We based our training recommendations on the assumption that trainees will likely have at most two or three hours to learn the conflict skills needed, and so recommendations for a course were bounded into six simple key training areas:

-) Insider attacks can have a complex mix of contributing socio-cultural, behavioural, organisational and political factors, making it difficult to understand and, therefore, to tackle this issue.
Verbal techniques including the use of active listening and the control of language style and delivery.

Non-verbal techniques such as body language and techniques to convey assertiveness and self-confidence.

Observation techniques including the ability to analyse human behaviours and identify warnings at an interpersonal level, as well as the ability to notice environmental and situational cues that might indicate conflict.

Risk techniques and the ability to apply the techniques flexibly.

Self-control techniques including strategies to control psychological and physiological responses to stress, fear and anxiety and to recognise the indicators given off by others.

Conflict resolution models and concepts including wider frameworks for responding to conflict from organisations such as the UK Police, HM Prison Service and the NHS. An example of one of these methods is the LEAPS model, used widely in the NHS, which teaches people to Listen, Empathise, Ask, Paraphrase and Summarise when dealing with a threat.

The proposed areas for training link to the identified competences and take into consideration the context of insider attack incidents. They have been designed to allow trainees to be able to influence a threat situation in a number of different ways and at differing levels of conflict escalation, from slight verbal disputes to overt physical attacks. The focus was on simple and rapidly exploitable techniques, methods and strategies that can be flexibly employed in an insider attack situation to positively affect the outcome.

**Beyond Afghanistan**

Although the immediate focus is on implementing these training solutions in Afghanistan to counter the current insider attack threat, the wider benefits of this training could continue post-Afghanistan. The simple and generic nature of the conflict resolution methods means that they could better prepare personnel for dealing with local forces and populations in future deployments and even enhance general skills such as leadership, communication and negotiation.

The insider attacks problem is inherently complex, novel and Afghan-specific in so many ways. However, the main benefit of our approach has been to bring together best practice from across a number of different organisations and industries to identify the generic aspects of conflict resolution and dealing with threat that can be applied in response to the counter insider attack challenge. The military can learn a lot from industry, and vice-versa, to establish well tested approaches to conflict resolution training and other areas.

Think back to the ALP Officer at his inauguration ceremony turning his weapon on his colleagues. There may have been windows of opportunity to detect, defuse and or dissuade the threat prior to the eventual tragic outcome. By equipping Coalition personnel with simple and easy-to-use conflict resolution methods, we are giving them, as far as is reasonably possible, the tools with which to identify threats early, implement mitigation techniques and engage with the perpetrator to potentially positively affect the situation and save lives.
Dates for your diary

**Peninsular South West Regional Group**

**30 April 2014, Paignton**

The next meeting of this Regional Group will take place between 7 and 9pm on Wednesday 30th April at The Paignton Club, The Esplanade, Paignton.

Veronica Conboy and Bobby Ashworth will talk about “The Crab Study Revisited” followed by Bernard Masters with “Neuro-Mechanical Fail Codes: The Ghost in the Machine”.

Refreshments will be served in the break. Please contact Bernie Masters if you wish to attend, email drbernie_masters@hotmail.com.

**Human Factors and Usability Engineering in the Development of Drug Delivery Products**

**3 July 2014, Cookham**

Medical Device Usability will host a one day seminar that focuses on the practical aspects of human factors testing for medical devices and drug delivery technologies. Speakers will include practitioners from industry and human factors specialists. There will be a practical workshop during the afternoon to focus on how to design, set up and run human factors testing for medical products. For more details visit http://medicaldeviceusability.co.uk/portfolio/seminars/.

Nominations sought research medal

The International Ergonomics Association provides the most prestigious annual award for outstanding original research leading to the reduction or mitigation of work-related injuries and/or to the advancement of theory, understanding, and development of occupational safety research. The IEA/Liberty Mutual Award in Occupational Safety and Ergonomics is funded by Liberty Mutual, whose Research Institute for Safety undertakes extensive research in this area. The recipient of the Award receives a US$10,000 prize and a medal. Details on the award can be found on the IEA website at [www.iea.cc/award/yearly_liberty.html](http://www.iea.cc/award/yearly_liberty.html). The winning paper and source journal would be recognised internationally through press releases issued by the IEA. The deadline for nominations is 31 May 2014. Communication in relation to nominees should be forwarded to the Chair of the IEA Awards Committee, Andrew Imada at pastpres@iea.cc.

**IEA Fellow nominations due soon**

The IEA Fellowship is given to recognise extraordinary or sustained, superior accomplishments of an individual. To be considered for a fellowship two eligibility criteria must be satisfied. In addition, the candidate’s distinction as an ergonomics professional must be demonstrated. Nominations are due by 1 May 2014. The submission form is available at [www.iea.cc/award](http://www.iea.cc/award).

Human & Organisational Factors in the Oil, Gas & Chemical Industries

**14 - 15 October 2014, Aberdeen**

The fifth international event in this series features speakers from some of the largest companies in the sector: Chevron, Total, BP and Maersk. You’ll hear how the latest human factors practices and ideas directly help improve procedures, competence and safety culture at all levels. More details will soon be available at [www.ogc2014.org.uk](http://www.ogc2014.org.uk).

The list of speakers for the two days is almost complete but the organising committee would be pleased to receive proposals for half or full day workshops for the day before or the day after the event. These proposals should be based around key human and organisational issues facing the oil, gas and chemical industries today, or they should encourage the transfer of knowledge from other high hazard or safety-critical industries such as nuclear, rail, defence, aviation, shipping or healthcare.

We particularly welcome proposals that present case studies of the application of tools and techniques or provide instruction in the use of such tools. These workshops should be interactive sessions that engage participants in working groups and exercises, rather than extended presentations. Where content is based around proprietary tools and techniques that are commercially available, the workshop materials should include working versions, even if they have limited functionality. To be considered, please submit a short proposal outlining the workshop content, duration, and biography of the facilitators at [http://bit.ly/1dI3661](http://bit.ly/1dI3661).

For any other information, please contact Marketing & Events Manager, James Walton, email j.walton@ergonomics.org.uk.
Student Voice

The PhD Blog
by Steph Eaves

The majority of the qualitative element of my analysis is now complete. It was certainly hard work, and after staring at 80 transcripts of interviews from builders, there were times that words stopped making sense and started just swimming around the screen instead!

That being said, I have thoroughly enjoyed revisiting my interviews with the builders; it was great to see how many of them cared about their health and wellbeing at work, which makes me feel really proud to be doing research in this area to hopefully improve their quality of working life.

I am now preparing to present my findings at various conferences this year, with the first being an internal conference here at Loughborough University.

DesRes (Design School Research Student Conference) is to be held on the 2nd April, which is perfect timing for me to rehearse my presentation for the IEHF Ergonomics & Human Factors conference the following week.

Not only will I be presenting my findings at various conferences, but I am also hoping to give a talk to Age UK’s Cambridge Committee. The Cambridge Committee are contributing to my project so I am really looking forward to showing them how their funding is being put to good use!

The findings from the first phase of my research will also be used for the second phase of my data collection, where they will be presented to stakeholders in the industry in order to gain opinions on opportunities and barriers to facilitate change in construction.

It’s great to know that this research is getting out to a wide variety of audiences, ensuring that healthy ageing in the workplace is an issue which continues to be seriously considered.

I also attended the Health & Wellbeing @ Work conference and exhibition at the NEC Birmingham in March. This is an event I have attended before and once again it did not disappoint. Our research got further exposure as my supervisor Dr Diane Gyi presented on healthy ageing in the construction industry, alongside a talk on human factors in offshore systems from Nick Taylor and a fantastically interesting presentation on being an expert witness by Dr Celine McKeown.

DIVERSIONS...

Is anybody there?
A session living up to its billing...

Thanks to Mark Rayson for this contribution.
Bursting into flower

What a lovely winter it has been. The crunch of frost under your shoes, sun splitting the ice blue sky, the sound of a three thousand horsepower pump trying to drain the floodwater out of your house. Perfect. The ideal time to throw another log on the fire, put your feet up with a warm Horlicks and read an ergonomics book.

But maybe your collection has been washed away? Well, option one is to speak to your insurers and pay Amazon to deliver a book at considerable cost or, in exchange for a one thousand word review which is published in the journal Ergonomics, you can have one for free. There is no catch and full guidance and support on how to write the review is provided. All we seek is a fair, balanced, professional critique of the work and an answer to the immortal question “would my fellow ergonomists find this useful and worthy of the purchase price?” What’s nestling on the ‘books for review’ shelves ready to burst into spring flower this month?

Staying indoors

As we all know, this winter the UK has been afflicted with some of the worst floods in a generation. What better time, then, to think about The Healthy Indoor Environment. Architectural and environmental ergonomics has become something of a theme in recent years and this book “makes recommendations for future procedures for investigating indoor environmental quality based on an interdisciplinary understanding”. This book is hot off the presses, and I am fairly sure somewhere inside is a recommendation to avoid three feet of floodwater in your home.

Winter warmer

Let’s continue the theme with another excellent title from Routledge called Adaptive Thermal Comfort. Again, this will appeal to the architectural angle on ergonomics. It looks at the conflict between comfortable buildings and energy efficient buildings. It doesn’t originate from an ergonomics view but it is clearly an ergonomic question. We need a reviewer to tell us what it might mean.

What did IBM ever do for me?

Let’s switch tack now and ask ourselves why computers look the way they do? Who decided they should be a box, a monitor and a keyboard? Who decided they should be cream coloured? According to this book it was the industrial designers who “calculatedly worked with IBM to shape the public image of the corporation and its products”. It wouldn’t matter if we weren’t still swearing at the ergonomic shortcomings 40 years later.

It’s catching

In Epidemic of Medical Errors and Hospital-Acquired Infections we learn the rather disturbing fact that this, rather than some causes of illnesses, are a bigger killer of patients. It sounds incredible but it’s true. This book is particularly interesting because it zooms out from the front line nurse, doctor, or whoever may have been the proximal cause of a mistake, to instead look at the wider social, organisational and societal issues. Coming soon to a waiting room coffee table near you. Or perhaps not.

2014 promises to be another bumper year for new ergonomics titles, all of which will be appearing here for review in due course.

For now, the full list of books for review appears below and are available for immediate despatch by contacting Dr Guy Walker, Heriot-Watt University, Edinburgh, EH14 4AS, email G.H.Walker@hw.ac.uk. Happy reading.

Books for review


Advances in traffic psychology. Sullman, M & Dorn, L Eds. 2012, Farnham, Ashgate, 978-1-4094-5004-7

Mental health issues are endemic in the workplace. Stress, depression and anxiety are estimated to be the cause of more working days lost than any other work-related illness. The Perkins Review of December 2009 clearly outlined the benefits that appropriate employment can bring to an individual including status, social connections, opportunities and financial reward. There is also strong evidence that appropriate work plays an important role in rehabilitation and recovery.

Access to Work is a Government scheme, run by the Department for Work and Pensions, which aims to aid people with physical disabilities or mental health problems in the workplace. Access to Work identified that individuals with mental distress would benefit from tailored support and commissioned ProAbility to design and deliver an operational pilot. The programme had historically focused on providing referred individuals with tangible objective support, such as support workers and adaptations to premises. However, for those with less tangible conditions, such as mental health problems, the barriers to work are often not physical.

ProAbility designed and delivered a human factors model of workplace support for individuals who either had mental distress or a diagnosis of mental illness. Mental distress has a much wider scope than the related term mental illness, which normally refers to a specific set of medically-defined conditions. A person in mental distress may be depressed, or exhibit symptoms such as anxiety and low self-esteem, without having a specific diagnosis of mental illness. People who endure mental distress in the longer term are more likely to be diagnosed with mental illness. The focus of the support was not on diagnosis but on the person's ability in the workplace based around the impact of work on their health.

ProAbility was aimed at supporting individuals with mental distress who had taken time off work with ill health or those in work who were having difficulty coping.

The defined aims of the ProAbility pilot were:

› Identify suitable referrals from customer groups who were at risk of having mental distress associated with their workplace.
› Provide holistic, confidential, tailored support for suitable individuals who were experiencing mental distress that was related to their work.
› Empower the customer and provide them with a toolkit of coping strategies that they could use in the future.
› Assess and report on the viability of the pilot methodology with a view to full implementation into the national Access to Work scheme.

The pilot was initially commissioned for 60 individuals in the North West of England and, due to its success, extended nationally, supporting over 160 individuals.

A human factors philosophy was used to develop the model of support with the main focus on user-centred design (UCD). The customer was placed at the centre of the model and their skills and knowledge were used to understand how all aspects of their working environment impacted on their mental health. Placing the individual at the heart of the support encouraged them to take an active role in their recovery from day one by making them an integral part in identifying problems and resolving them.

The scheme aimed to provide holistic support that was impartial to both the customer and the employer. The support was tailored to each individual, flexible and customer-led to encourage the customer to feel empowered and positive about their own abilities. The long term goal was to develop the individual's independence by developing a toolkit of coping strategies to enable them to help themselves and improve self-confidence.

Support was provided through a series of one-to-one meetings over a flexible time frame, the average being 16 weeks. At the first meeting a human factors health assessment was completed to gain a picture of the individual's health and to identify the impact the working environment

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Feature

A human factors approach to mental health in the workplace

Louise Pode
had on them. The assessment was designed, not to be a definitive diagnostic tool but to ensure the assessment was holistic and comprehensive. The working environment was divided into four areas: task/job design, organisation, environment and personnel, with the aim of identifying any aspect of the environment from physical demands to management style, which could be having a negative impact on their mental health.

An integral part of the assessment was using the skills and knowledge of the individual to pinpoint key stressing factors in their role. A modified hierarchical task analysis (HTA) proved to be a useful tool in helping the individual identify the aspects of their work that impacted on their condition. This analysis was particularly important for those who were overwhelmed by emotion as a result of their experience. The clear systematic approach of HTA enabled them to identify a clear way forward to overcome their barriers to work.

Following the health assessment, a Support Action Plan was drawn up with the individual to identify a framework for their support. The barriers to the customer’s work were broken down into small goals with clearly defined actions, which were dealt with individually, providing focus and reducing the scale of the task ahead. Inherent within the Plan was identifying where the working environment could be modified to suit the individual’s current requirements. Management of issues such as anxiety, conflict, anger and depression in the workplace were included. Coping strategies were developed for these that would enable the individual to manage in the longer term. Central to the success of the plan was its flexibility; with mutual agreement it could be modified at any point to reflect the individual’s needs.

Working with the employer was an important part of the support process. Employers who are better informed can make the workplace far less intimidating by educating managers and colleagues. It was also important to develop the individual’s self-confidence so they felt able to engage with their employer. Regular employer review meetings were important tools in ensuring the individual had a forum to outline their concerns and successes in the long term.

The results of the pilot were positive and clearly demonstrated the effectiveness of the human factors model. ProAbility supported a wide variety of individuals from a diverse range of jobs. It demonstrated that the human factors model was robust, adaptable and effective. The very nature of mental distress and pressure of the current economic climate and stigma of mental health makes individuals wary of seeking support. ProAbility achieved its aim of accessing these individuals by working with the medical support networks to establish itself in the community. The success of the approach was reflected in the statistics, with 80% of individuals being new to Access to Work.

70% of individuals receiving return to work support successfully achieved their goal. 100% of these customers had retained their employment at the six month point. Of those individuals who were being supported whilst in work because they were not coping, 93% retained their employment. Customer response data demonstrated that individuals felt more in control, had increased confidence and used their coping strategies to manage their mental health in the workplace.

More specifically, from supporting individuals with cancer, it identified that a specialist cancer work support service should be developed aimed at fatigue management programmes, assisting with psychosocial barriers and coping strategies for cognitive difficulties.

ProAbility’s human factors approach to supporting individuals with work-related mental health problems has made a significant difference to those involved in the pilot. Its strength lies in the UCD approach, which places the individual at the heart of the support, as an integral part of the process, thus empowering them.

Fundamentally, early human factors intervention and provision of personalised support, which engages the individual and increases their confidence, proved to be an effective way to sustain employment and enable them to have a good day at work.
News in brief

The bank robber’s new tool: a text message

A new threat to banks has been identified in Mexico, where cybercriminals have developed malware that allows a text message to order ATMs to spit out money.

The malware, known as Ploutus, allows the criminal to connect a mobile phone to the ATM. It is necessary to break into the ATM cabinet to physically connect the phone via USB cable, but once that is done all that is needed to obtain cash is to send a text to the phone.

Technology bloggers are warning that since 95% of the world’s ATMs use Windows XP, and XP is due to be decommissioned this month, the danger that this sort of cyber attack will become widespread is very real.

For more on this story, see http://bit.ly/1dJDLD9.

Secretive robots in Oxford

Researchers at the University of Oxford’s Internet Institute are exploring ways in which humans might interact with life-like robots that take on tasks such as companionship for the elderly.

One issue they are considering is privacy and the ways in which robots might be programmed to protect people's information.

Because the robots will have the ability to gather and store large amounts of information about the people they work with there is a danger that they could ‘betray’ them and pass on their information to third parties.

The issue of building secrecy into robots’ programming is a complex one, and researchers are exploring questions such as “who should decide on the values that determine a networked society?”

For more on this story visit http://bit.ly/1lcrQST.

Mistrust is a barrier to home working

Research carried out by recruitment specialists Randstad has shown that one of the biggest stumbling blocks in increasing flexibility in the workplace is the belief among management that if they cannot actually see staff working then they are not doing any work.

Despite the fact that flexible work practices such as working remotely, working part time or doing condensed days have been shown generally to increase productivity, there is still a lack of trust between organisations and their employees.

For more on this story see http://bit.ly/1gTpBPZ.

Complex series of events led to Resolute plane crash

On 20 August 2011 a Boeing 737-200 travelling from Yellowknife to Resolute in Canada crashed into a hill and broke into three pieces, killing all four crew members and eight of the eleven passengers.

The final report into the crash was released last month. In the report, the Transportation Safety Board of Canada concluded that the crash was due to a series of events that meant both the pilot and copilot did not realise how close they were to terrain until it was too late.

According to the report, the aircraft missed the runway centreline signal as it made its autopilot-managed approach to the airport in Resolute Bay.

An inadvertent movement of the control column caused the autopilot to switch modes, but neither the pilot nor the copilot realised this switch had been made due to being oversaturated with work in preparing to land. As a result of the mode switch, the autopilot did not continue turning to try to reintercept the centreline signal but instead levelled out.

In addition, the compass on the aircraft was malfunctioning and providing incorrect readings to the flight instruments. This incorrect information caused the pilot to believe the aircraft was flying more toward the west than it was. In fact the aircraft was flying parallel to the runway and was being blown further to the east.

The First Officer raised concerns about the incorrect heading and suggested a go-around more than once but the pilot ignored him as he was trying to reconcile the conflicting information he was getting from the aircraft’s flight controls.

A go-around was attempted when the ground proximity alarm sounded but there was not enough time to gain altitude before impact.

Investigation revealed that the pilots had received outdated training in a compressed format.

The report concluded that what ultimately caused the crash was the failure of communication between the pilots due to poor training and recommended that Canadian regulators act to ensure a higher standard of training among air crew.
**Membership matters**

The IEHF Special Interest Groups (SIGs) are topic-based groups that provide a forum for exchange of ideas and growth of the topic within the subject of ergonomics. They assist in promoting ergonomics within that topic area to a wider audience. They also take a key role in identifying and responding to consultations from government bodies.

At the start of the year, the following SIGs were in existence:

- **Ageing and Work**: organiser Joanne Crawford, Joanne.Crawford@iom-world.org
- **Driving Ergonomics**: organiser Nick Gkikas, nick@autonomics-consulting.co.uk
- **Early Career Researchers**: organiser Laura Lewis, earlycareerresearchers@gmail.com
- **Healthcare Ergonomics**: organiser Janet Anderson, janet.anderson@kcl.ac.uk
- **Human Computer Interaction**: organiser Tony Russell-Rose, hci_sig@yahoo.co.uk
- **Motorcycle Ergonomics**: organiser Laurence Clift, L.Clift@lboro.ac.uk
- **Nuclear Ergonomics**: caretaker organiser Clare Pollard, clare.pollard@arevarmc.com
- **Occupational Safety & Health**: organisers Terry Woolmer, Stuart Shirreff and Andrew Pinder, oshen@ergonomics.org.uk
- **Sports Ergonomics**: organisers Steve Bayer & Daniel Simmons, steve@spartanintl.co.uk and dsimmons@ccd.org.uk

Are you a member of a SIG? It’s easy to join one. You can become part of any SIG by emailing the organiser and telling them you would like to be on the mailing list. Then you’ll receive communications associated with the group’s activities. The level of involvement depends on you — get information, share your thoughts on topics, support consultations, go to meetings — all of this will depend on how much effort you want to expend.

Did you know there’s a new SIG in town?

Aside from the list above, there is a new SIG that was approved by Council last month. The Children’s Ergonomics Special Interest Group has been formed by Jim Taylour (Jim.Taylour@orangebox.co.uk). Its aim is to exchange and distribute research, observations, findings and guidelines which all help to raise design standards and policies for children at home, on the move and in schools with the intention of improving health, safety and wellbeing amongst the young.

The group aim to have a lobbying function to encourage parents, health practitioners and education leaders to focus concern in applying pressure on government to think again about the health and safety guidelines in schools protecting children. It will strive to work with charities and other bodies nationally and internationally and are planning to hold a bi-annual meeting.

Other groups are busy planning meetings, responding to calls for consultation, and engaging with their members. This week I was at the Nuclear Ergonomics SIG annual conference. It was a great event that was really well attended, with some thought-provoking presentations and a free lunch! See page 10 of this issue for more details about this event.

So, join a SIG. If you’re already a member of a SIG, please think about contacting the organiser to offer them some help. All of them are volunteers who are busy with their day jobs so I’m sure they would appreciate any support you could give them.

As usual, please feel free to contact me if you wish to discuss any aspect of IEHF membership, by emailing me at clare.pollard@arevarmc.com.

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**DIVERSIONS...**

**Telling it like it is**

Probably best not to try and discuss the finer points of this statement.

*Thanks to Murray Sinclair for this contribution.*
Membership update

The Institute welcomes those listed below who have recently been accepted as new members, and congratulates those who have upgraded.

Fellows
Tim Hughes from Gloucestershire. BSc Psychology 1989, University of Birmingham.
Laura Milnes from Guildford. MSc Work design & Ergonomics 1996, University of Birmingham.

Registered Member
Robert Bracewell from Lancashire. MSc Human Factors 2009, University of Nottingham. Employed as a Human Factors Analyst.
Jeremy Mawhood from Stockport. MSc Applied ergonomics by distance learning 2012, University of Nottingham.
Anna Ponting from Reading. MSc Ergonomics 2005, Loughborough University. Employed as a Senior Human Factors Analyst at AWE.
J Paul Clark from Farnham. MSc Ergonomics (Ergonomics or HF/HCI specialisms).
Laura Lewis from Middlesex. MSc Human Factors 2010, University of Nottingham. Employed as an Ergonomics Consultant.

Graduate Members
Ara Avakian from London. MSc HCI with Ergonomics 2012, University College London.
Catherine MacMillan from Greater Manchester. MSc Health Ergonomics 2012, Derby University.

Associate Members
Claudia Krehl from Oxfordshire. MSc Management of IT 2009, University of Nottingham.
Dana Budzinski from Australia. Postgraduate Diploma in Occupational Health Nursing, Curtin University, graduates in 2014.
Fairoz Noor from Singapore. MSc Design Engineering, Swinburne University Of Technology, graduates in 2016.
Emma Dawson from Gloucester. MSc 2014, Cranfield University.
Beaux Bryant from London. BSc Physiotherapy 2000, Brunel University.
Catherine Driussi from Western Australia. MSc Human Factors 2012, University of South Australia.
Mia Hitchcox Lederman from East Sussex. BSc Osteopathic Medicine 1997, European School of Osteopathy.
Stefanos Symeonidis from York. MSc HCI with Ergonomics 2013, University of York.

Student Members
Harry McKendrick from Newcastle. BSc Ergonomics (Human Factors), Loughborough University, graduates in 2016.

Back pain research ergonomist dies

It is with sadness that we report that Duncan Troup has passed away. Duncan was a PhD supervisor at Liverpool during the 1980s, before retiring to Huntly in Aberdeenshire.
His group won the Volvo prize for lower back pain research in 1987 and he was well known to those from the Roben’s Institute, those that started out in mining research, and those with an interest in patient handling and lower back pain research. A fuller obituary will follow.

New Chief Executive sought

After more than 6 years guiding the IEHF towards Chartership, Dave O’Neill has decided that it is time for him to stand down as our Chief Executive. I am pleased to say however that he will be continuing his involvement with ergonomics and the IEHF for some time to come.
We have therefore turned our attention to the search for his successor. The advert on the back page of this issue will be appearing more widely in the next month or so and we hope to have someone in post towards the end of the summer.
Although there will be further opportunities for a more detailed vote of thanks to Dave, I would like to take this early opportunity to thank him for all is work for the Institute and to wish him the very best for the future.
Richard Graveling
IEHF President
**Academic Vacancies**

**PhD Studentship: Digital Innovation for Improving Travellers’ Experience**  
**Loughborough University**

This research study will investigate design opportunities that improve travellers’ experience through digital innovations. Methods in service design and interaction design will be used to research about user requirements and design a prototype.

The PhD candidate can propose to tackle a specific aspect of travellers’ experience, such as hospitality, emotional experience, travel-related service, travel-related initiatives for social good, cultural interactions, or experience during the journey, etc.

The PhD candidate is encouraged to specify the targeted user group(s) by considering characteristics such as purposes of travel, psychological profiles, demography or other personal attributes. The candidate is also encouraged to be original in proposing the specific research study.

The ultimate aims of this research are to discover design opportunities that improve travellers’ experience, propose a digital innovation, and design a prototype.

Applications with strong connections to service design will be especially welcomed.

Deadline: 22 April 2014. For more details, visit [www.jobs.ac.uk/job/AII518](http://www.jobs.ac.uk/job/AII518).

**PhD Studentship: Computational modelling of the dynamic interaction between the human body and a car seat**  
**University of Southampton**

The modern car seat consists of nonlinear polyurethane foam cushions and complex supporting structures, and the seated human body is also a highly damped nonlinear dynamic system.

The complicated dynamic interaction between the two systems can be described by computational models of the car seat and occupant and are required for optimising the seat design, for example to promote ride comfort.

This PhD project is designed to research the dynamic interaction between car seats and the seated human body and develop a computational model of the seat-occupant system using nonlinear finite element methods.

It is expected that the development of the model can help advance understanding the dynamic interaction between the seat and the body and that the developed model can be used to predict seat transmissibility, and to optimise the seat design so as to improve ride comfort.

Deadline: 26 May 2014. For more details, visit [www.jobs.ac.uk/job/AIL294](http://www.jobs.ac.uk/job/AIL294).

**PhD Studentship: Digital Technologies for Sustainable Travel**  
**Loughborough University**

This research will take a service design approach to improve the experience (and ultimately uptake) of sustainable transport choices. It will be based around the development of digital technologies and will aim to have an exploitation path through engagement with appropriate external bodies (public, private or third sector).

Recognising the increasing importance digital technology plays in the experience of and interaction with sustainable travel choices, this research will seek to enhance user experience, through the engagement with and development of particular tools and methods to capture and/or display travel information, behavior or choices.

The research could examine mobile or tablet applications, interactive displays, ambient media or public information displays as methods for sharing information, and study ways in which this information is imparted to and received by the viewer.

Deadline: 22 April 2014. For more details, visit [www.jobs.ac.uk/job/AII492](http://www.jobs.ac.uk/job/AII492).

**Lecturer in Human Factors**  
**University of Nottingham**

Applications are invited for the post of Lecturer in the Department of Mechanical, Materials and Manufacturing Engineering in the Faculty of Engineering at University Park, Nottingham.

The appointment will complement and strengthen the Faculty’s research and teaching activities in human factors. The successful candidate will contribute to the delivery of teaching for the Department’s undergraduate and postgraduate taught courses.

hey will also be expected to join the Human Factors Research Group within the Infrastructure, Geomatics and Architecture Research Division and contribute high quality research.

Deadline: 16 April 2014. For more details, visit [www.jobs.ac.uk/job/AIU810](http://www.jobs.ac.uk/job/AIU810).
Device Development Scientist – Human Factors/ Packaging Development

The Device Development Team in Mylan’s Global Respiratory Group is responsible for device design, industrialisation and analytical testing of new inhalation drug products. The team is part of Mylan’s Global R&D group.

In this position the successful candidate will have a key role in the support of the Device Development Groups’ Human Factors and Device labeling / packaging development programs. The candidate will have a clear understanding of FDA Quality Systems-Design Control requirements and be responsible for ensuring that the needs of the user are appropriately defined, verified and validated. This position will interact with key external vendors and include the development and testing of device labelling and instructions for use.

This position will support the Human Factors Assessment Programs in accordance with regulatory guidelines and standards. As part of the Human Factors program, you will deliver graphics for device packaging components resulting in a commercial-ready pack.

If you want to be part of a global healthcare company that is making a difference and changing lives, Mylan may be the place for you. We encourage you to visit Mylan.com to learn more about our unconventional approach and how your skills might complement our mission. Mylan offers competitive salary, excellent benefits and an environment conducive to professional growth and advancement.

To find out more, visit the jobs list at www.ergonomics.org.uk.

Chief Executive

East Midlands
£40 - £50,000, depending on skills and experience

You will be a Chief Executive with a collaborative style, lots of enthusiasm and the ability and experience to take the Institute of Ergonomics & Human Factors forward into the next phase of our development – we are at an exciting time in the Institute’s history. You will inspire and lead our small team of staff, working with the Institute’s Board of Trustees (Council), to increase influence, membership, and income whilst ensuring compliance with the obligations of a charity.

The Institute was established over 60 years ago as the first professional body for ergonomics/human factors in the world and attracts worldwide membership. Ergonomics/human factors is about designing for people, wherever they interact with products, systems, processes and environments, and the IEHF is the only body in the UK managing and representing qualified ergonomists as well as promoting a wider understanding of ergonomics.

You will be educated to degree level, or equivalent and have the ability to promote the IEHF externally to a wide variety of stakeholders in the UK and overseas, including key opinion-formers in government, industry, academia and other organisations and professional bodies. You will also contribute towards promoting the highest professional standards among our members.

The duration of the post is negotiable, but expected to be for a period of not less than five years. The role is full-time, but a part-time position may be considered for an outstanding individual where this is to the benefit of the Institute and the candidate.

See www.ergonomics.org.uk for further details and how to apply.

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