

# HUMAN FACTORS

I met an international pilot the other day who asked me what I did for a living. I told him that I work for the Civil Aviation Safety Authority. “Oh”, he said as he shrank back a little, “and what do you do there?”

“I’m a human factors researcher.”

He took on a slightly patronising tone. “Right. Human factors is just crew resource management, remember that and you will be fine”.

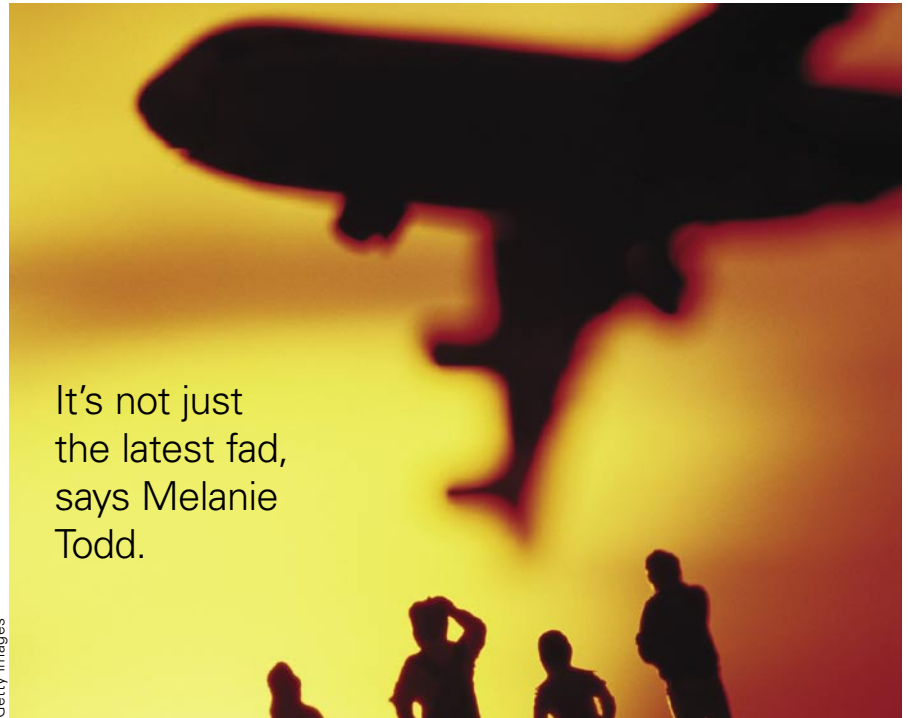
I let the comment slide. I was astounded that a senior pilot could think that.

As well as CRM, the discipline of human factors includes such areas as ergonomics (design of cockpits, tools, cabin galleys), psychology (decision making, judgment, information processing) and physiology (fatigue, physical limitations, operating environment).

Human factors aims to optimise the interaction between humans and technology, including our interaction with equipment, the physical environment, procedures and other people. Human factors includes the management, avoidance and control of human error, recognized by the International Civil Aviation Organization (ICAO) as the single most serious threat to aviation safety.

The origin of the discipline dates back to the 1930s. It was in this decade that the journal “The Human Factor” first appeared in response to studies conducted into workplace deaths and accidents due to heavy machinery. Safeguards were developed from these investigations to help prevent these types of accidents occurring. These were the first ergonomic studies designed to help prevent and protect workers from the disastrous effects of operator error.

By 1949 the Ergonomics Research Society had been created in the UK in response to aviation safety issues identified during the Second World War. In 1957 the Human Factors Society was established in the USA and in 1959 the In-



It’s not just the latest fad, says Melanie Todd.

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ternational Ergonomics Association was born. In 1971 Loughborough University in the UK ran a short course in human factors in transport aircraft operations, one of the milestones for aviation human factors.

Human factors looks at the actions of individuals from the point of view of people’s intentions. What goals were they trying to achieve? People do not set out to make mistakes that end in incidents and accidents. Quite the opposite, their actions are often dictated by the information they receive, their training and their understanding of the consequences of their actions.

**System set-up:** Often there are other factors that influence the outcome. For instance a pilot retracting the gear instead of flaps on landing may do so due to a combination of a poorly designed cockpit, poor procedures and fatigue – not because they chose to do so. An engineer may reassemble a part incorrectly because the maintenance manual was unclear or they were distracted from the task and returned to it, thinking they had completed more than was done. Cabin crew may suffer injuries from working around sub-standard equipment because they had no other choice because of the design of the cabin or deficiencies in equipment.

People do not usually choose to do the wrong thing; the system they are working within sets them up to do something that is unsuitable or incorrect. This could be because of misguided preconceptions, deficient equipment, poor design of the workspace, the effects on judgment and decision making of stress, fatigue or other factors. Sometimes the culture of the workplace promotes actions that result in unsafe conditions.

Human factors aims to address these issues by removing as many error-producing conditions as possible and training crews to catch errors that sneak through and deal with them adequately. This requires continual monitoring for threat and error at all levels – from management decisions to the operation of equipment. You’ve also got to watch out that in fixing something you don’t introduce another error.

Human factors training has been mandatory for candidates for commercial and ATPL licences since the mid-1990s and under CASA’s regulatory reform process it is also likely to be required for cabin crew and maintenance. The leading airlines worldwide are expanding human factors training for their operational staff. It is certainly not a passing fad.

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