

TAPOIA Project

Crew Communication Metrics

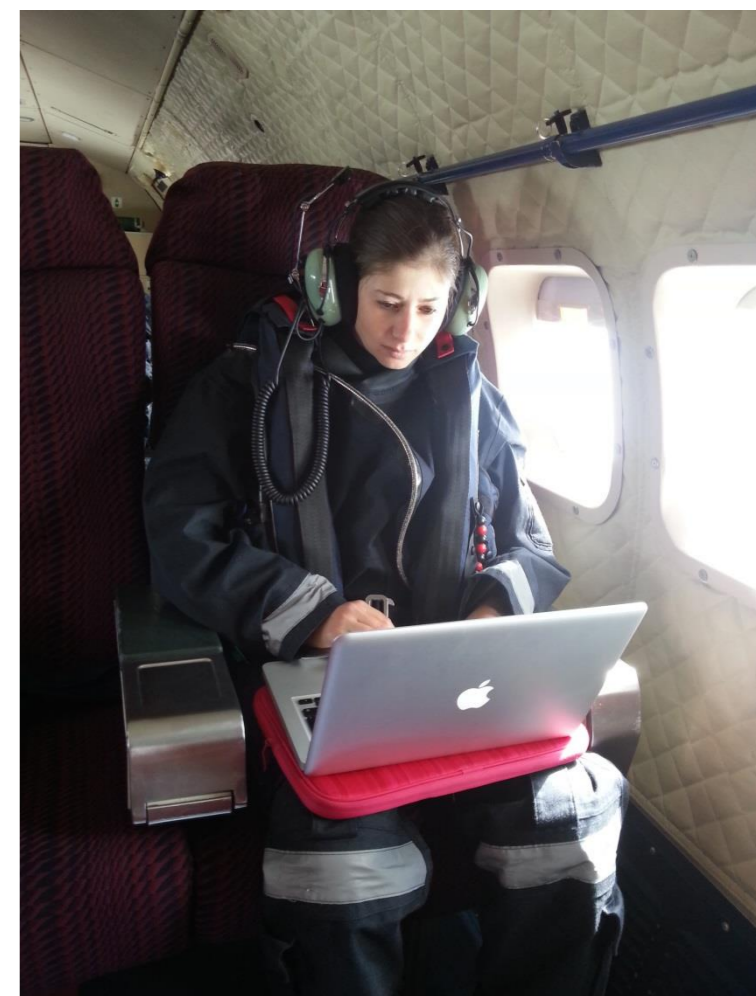


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Speech science and aviation safety?

- **Original Science discovery**; automatic detection of levels of prosodic accommodation between two interlocutors i.e. we can detect whether two people are communicating effectively.
- **Non-verbal communication** is critical is even more importance on the flight deck (given the high levels of instrumentation and situational awareness required)
- **Aviation safety focus**; we established need for objective metrics for assessing CRM skills in pilots.
- Funding for a '**Lab to market**' applied research software development initiative in aviation (sponsored by [Enterprise Ireland](#))



What does prosodic accommodation mean?

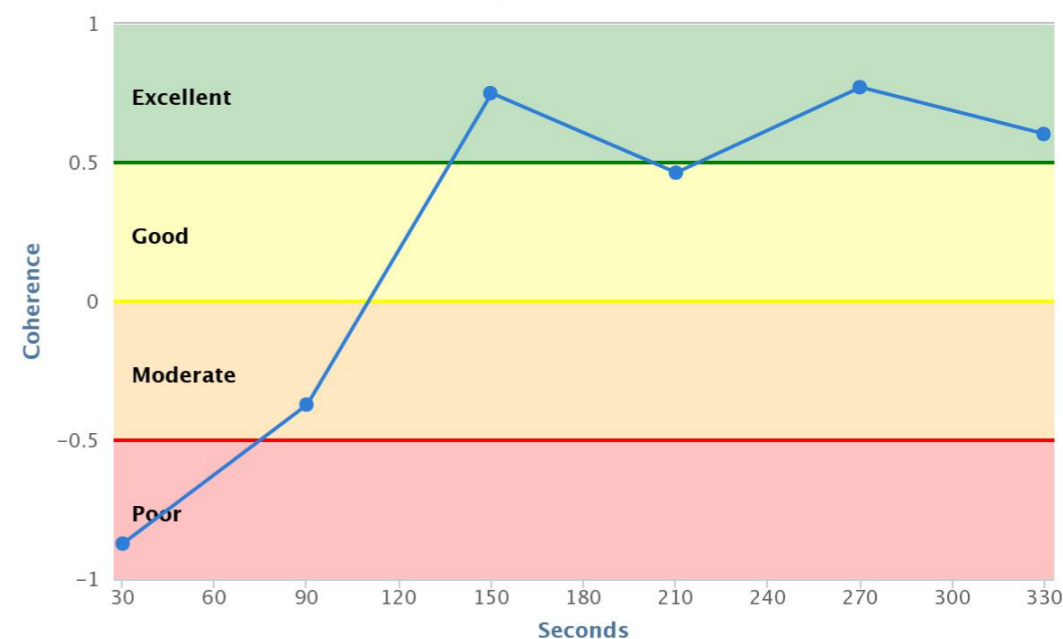
- Clear, **concise** communication means **higher** rates and types of prosodic accommodation
- When people accommodate to each other, they are more **involved** in a conversation
- They are **subconsciously** adapting to ensure clear communication
- They are communicating in a more **cohesive** manner and less prone to miscommunication.



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Measuring communication skills...

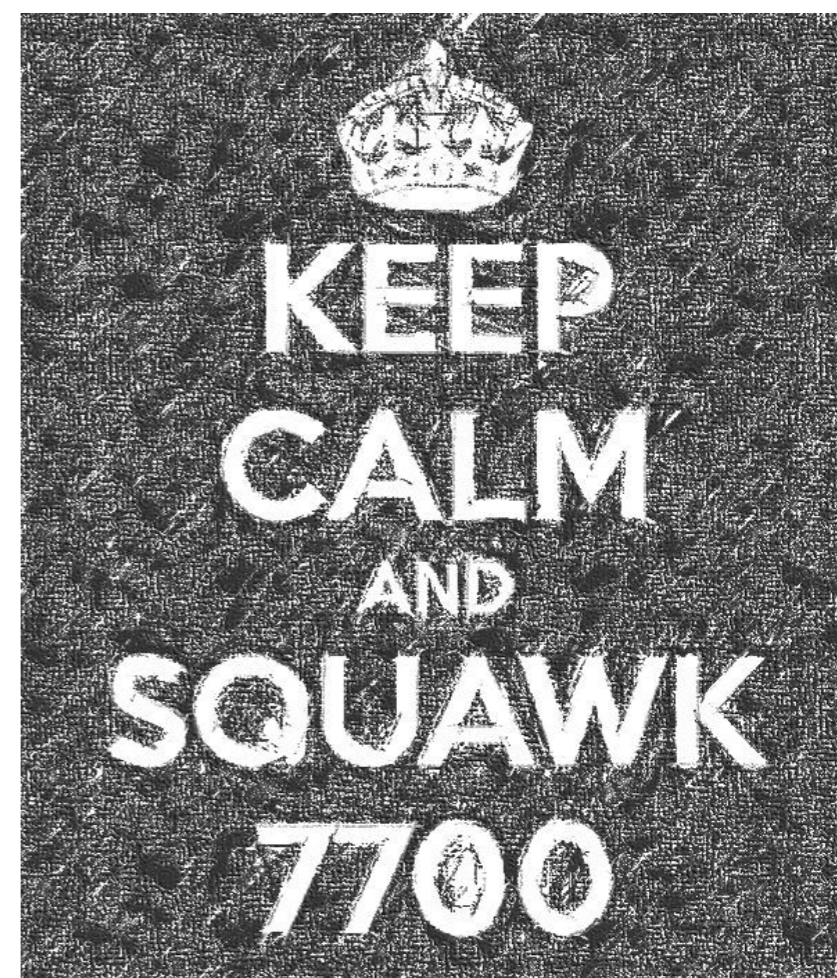
- We developed speech analysis software to examine how the prosody (pitch, rhythm and tone) of two speakers adapts to each other: **accommodation**
- Prosody becomes **more or less** similar during a conversation
- We measure the **dynamic** changes of this adaption during a conversation and represent this via metrics and graphs.
- Sample graph shows overall **communication performance**.
- Scientifically **validated** alongside CRM assessment data(CDA).



AVIATE - NAVIGATE - COMMUNICATE

Why is this important for pilots?

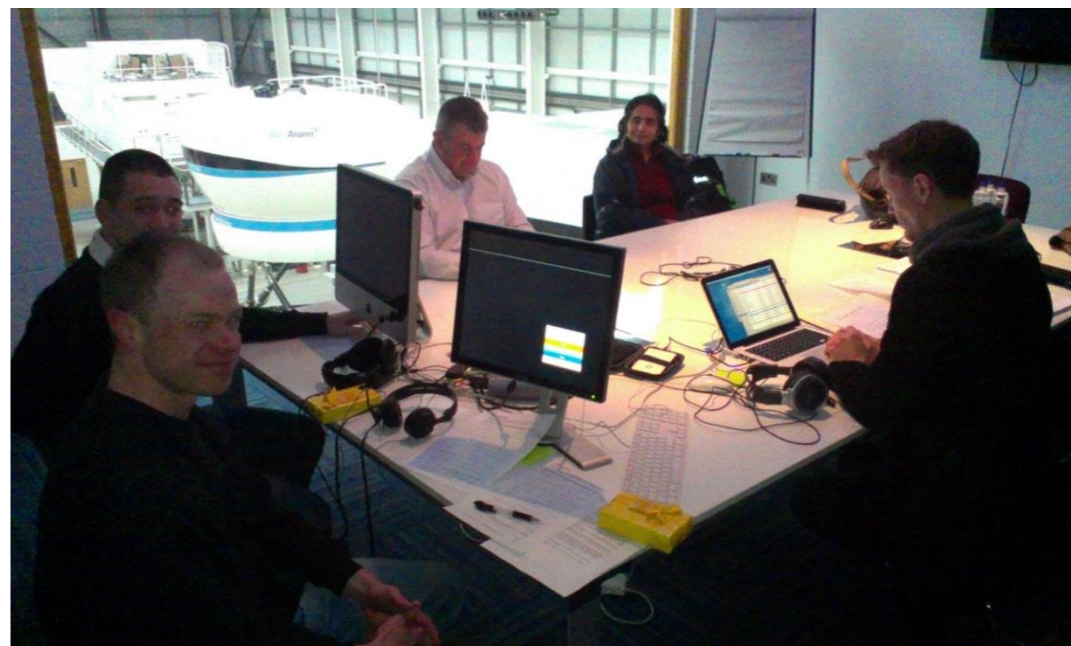
- Crews working in **mission critical** environments need clear, concise communication.
- The physically **restricted confines** of a cockpit mean that good vocal communication and coherence are a critical skill.
- Pilots rely on each other to communicate clearly, especially in an **emergency** or difficult situations.



Partnered for validation phase...



CIHS



Benefits of communication metrics?

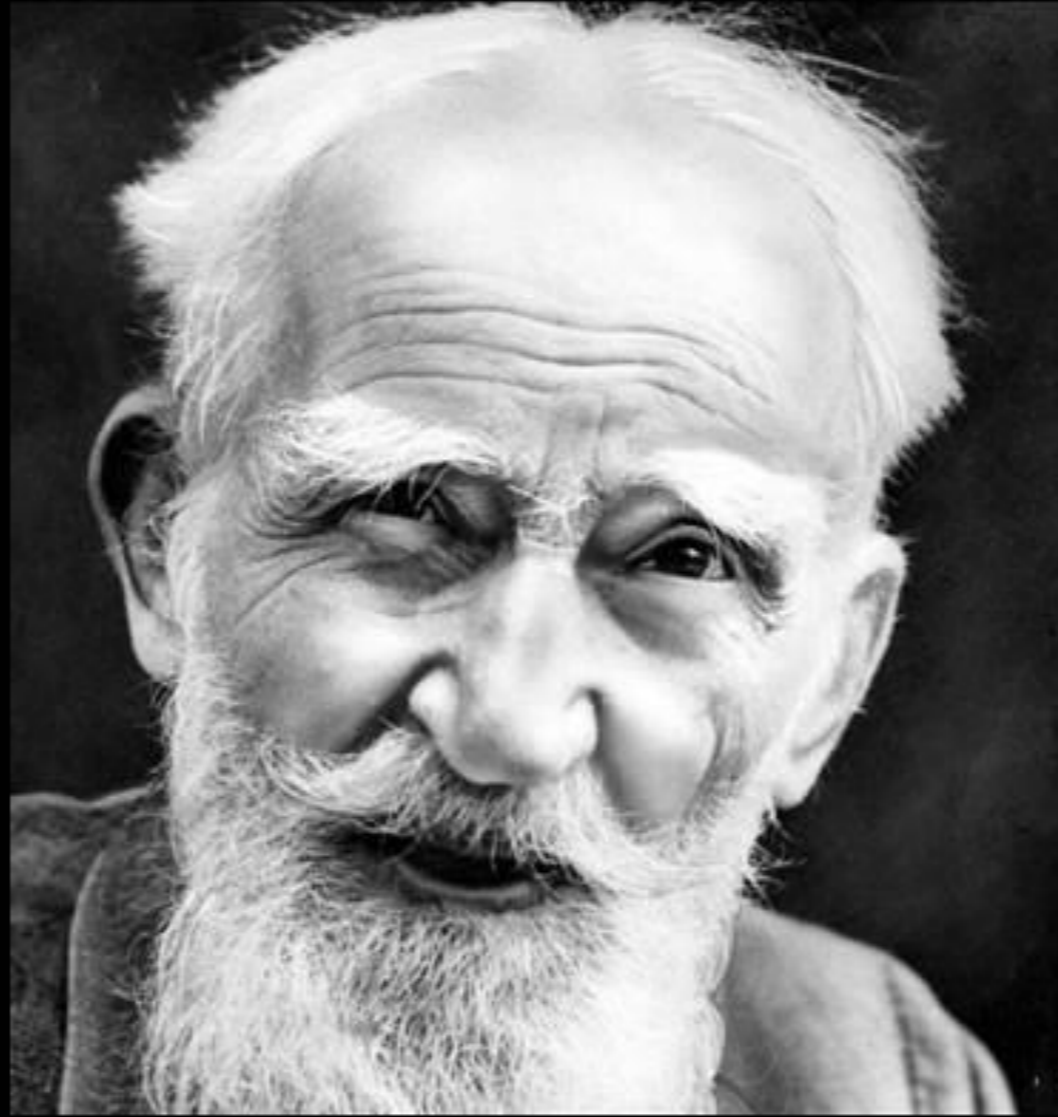
- **Pilots** can receive objective performance based feedback on their non-technical skills (validate their expertise and/or receive coaching to develop their skills further).
- **Airlines** now have the opportunity to set new objective standards for communication skills. Measurable, achievable and accredited.
- **Instructors** can be more confident they are assessing crews in a more uniform manner. An advanced debriefing technology to complement existing systems.



Development plans...

- Launched a **campus company** to engage the aviation safety and crew training industry in a more meaningful way.
- Launched a cloud-based **Serious Game** called 'ShipWreck' for airlines and ATOs to begin sampling pilot communication skills (is there a skills gap?)
- Looking to **integrate** the core speech analysis technology into simulators for use in LOFT.
- Seeking 3 **airline partners** for a 12month commercial research and development programme. (more details available)





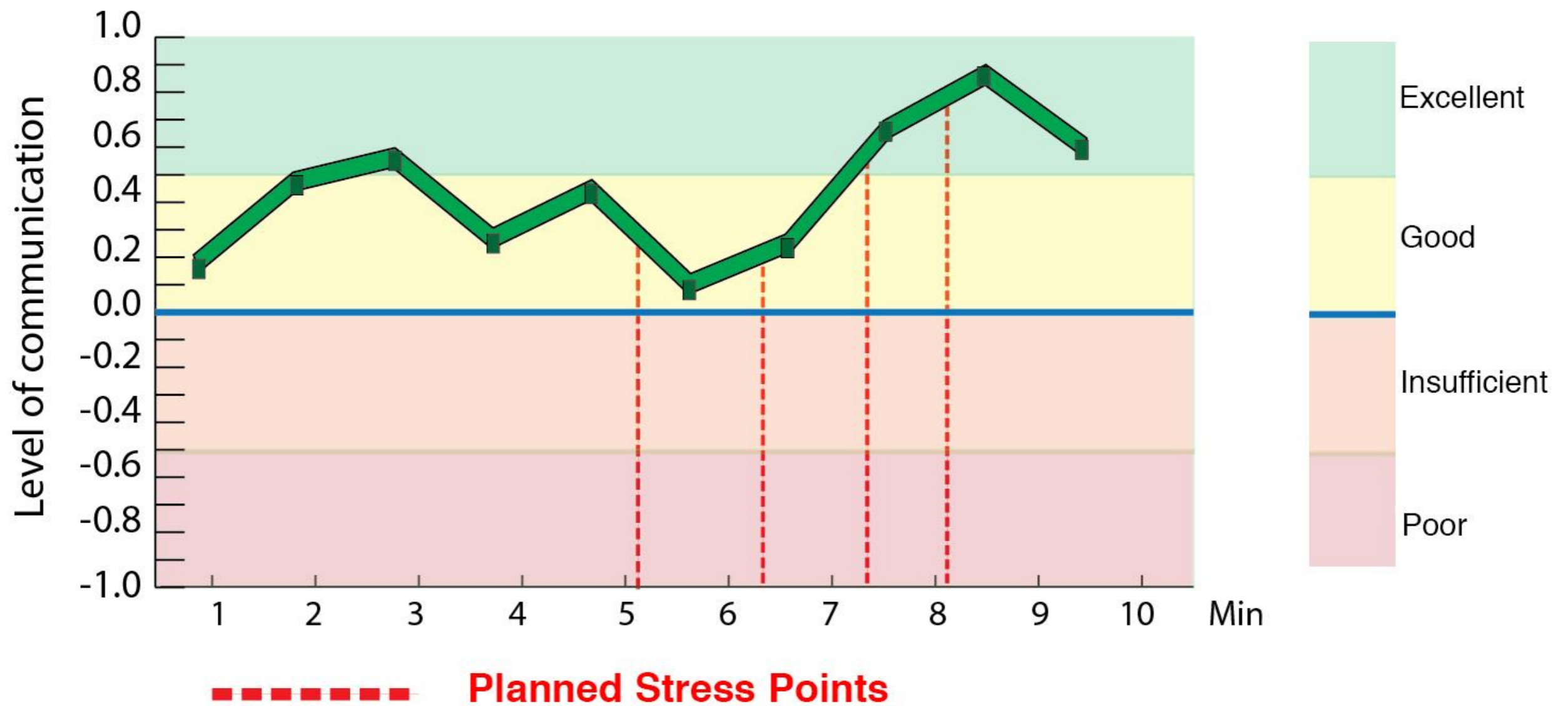
**The single biggest problem in communication is
the illusion that it has taken place.**

George Bernard Shaw

Appendices

Sample metric...

Communication between pilots over the course of the task



Project achievements..



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Speech science style @ 10,000ft



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of our report
summary here

<http://tinyurl.com/p5mp8k3>

Pilots have their say...

"We were delighted to support this CRM skills research project. It was great to see the positive reactions of crew to a new innovation from an Irish University, particularly where crew training and air safety are in focus. Given that Human Factors is perhaps the final frontier in aviation safety, we remain committed to supporting this extremely valuable initiative"

Paul Cullen

*Director IALPA Safety and Technical Committee
2011-2013*



Contact us now at CrewFactors...

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