New Zealand Journal of Health and Safety Practice
He rangi ta matawhaiti
He rangi ta matawhanui

A person with narrow vision has a restricted horizon; a person with wide vision has plentiful opportunities

Safety in Design Through University–Industry Collaboration: Embedding Ergonomics in Aviation Product Development. Air NZ AUT Joint Projects

Vol 3; edition 4; November 2026

Author: Madeline Hernon, Air New Zealand – Injury Management & Prevention

Email: madeline.hernon@airnz.co.nz

DOI: https://doi.org/10.26686/nzjhsp.v3i4.11874

Keywords

Tertiary education; industry collaboration; student engagement; safety-in-design

Abstract

Problem: Safety-in-design decisions are often made before users, operating environments and manual-handling demands are understood. This risks products valued by customers creating avoidable physical demands for staff who handle them. Air New Zealand is collaborating with Auckland University of Technology (AUT) to embed human factors and ergonomics (HFE) in product development.

Method: The collaboration engages students from second year to Masters level in manual-handling risk assessment, the hierarchy of controls and ergonomic principles. Students examine products and processes as systems through site-based problem framing, worker input, task analysis and concept review. Two case studies: adaptation of an airline jug, and redesign of the Business Premier mattress. The mattress project, led with a Bachelor of Industrial Design student, mapped its lifecycle: laundry, supply and amenities placement, transport to the aircraft, cabin-crew interaction, storage, offboarding and return to laundry. Whilst second year students did the same with the coffee jug.

Findings: The assessment showed that a desirable customer product can create cumulative risk across multiple touchpoints. Mattress rolling, handling and transfer may expose staff to awkward postures and physical effort; focusing only on the cabin task would miss upstream and downstream contributors. The jug case similarly demonstrated that designs must be assessed against the process of use, not assumed use. Whilst looking well designed and on brand.

Changes made: The collaboration has established an educational and practical pathway for applying the hierarchy of controls before designs become fixed. Students identify opportunities to eliminate or reduce manual-handling hazards through product and process design, and test concepts against real life operational requirements. For Air New Zealand, the approach brings fresh design capability into early problem-solving and strengthens the evidence base for safer procurement and implementation.

Practical relevance: Embedding HFE education in tertiary design programmes can develop graduates who design with workers, not merely for end users. This partnership offers a transferable model for turning manual-handling assessment into safer, more usable product systems in practice.