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| Title | Demonstrate knowledge of introductory Human Factors, tools and principles for the aviation industry | | |
| Level | 4 | Credits | 8 |

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| Purpose | <p>People credited with this unit standard are able to demonstrate knowledge of: the development of Human Factors and the emergence of Crew Resource Management; information processing and decision-making in the context of an ultra safe industry; the effects of stress on the individual Liveware component of the SHEL model; the principal theories behind Threat and Error Management and identify skill-based tools utilised as countermeasures.</p> <p>They are also able to: demonstrate basic knowledge of the threats to communication in the aviation environment; and explain teamwork in a multicrew environment.</p> |
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| Classification | Aviation > Aviation - Core |
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| Available grade | Achieved |
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Guidance Information

- 1 Definitions

Accepted industry standards refer to the recommended practices set by the International Civil Aviation Organization (ICAO) and the Civil Aviation Authority of New Zealand (CAA).

SHEL refers to the model Software/Hardware/Environment/Liveware.

Ultra safe industry refers to the concept formulated and discussed by Prof. James Reason.
- 2 Texts referred to or applicable to this unit standard include –

Prof James Reason, *Human Error* (Cambridge: Cambridge University Press, 1990);
 Frank H Hawkins, and Harry W Orlady, *Human Factors in Flight*, 2nd ed (Hampshire: Ashgate Publishing, 1993);
 David O'Hare and Stanley Roscoe, *Flightdeck Performance – The Human Factor* (Ames, Iowa: Iowa State University Press, 1990);
 Roger G Green, Helen Muir, Melanie James, David Gradwell, and Roger L Green, *Human Factors for Pilots*, 2nd ed (Hampshire: Ashgate Publishing, 1996).
- 3 All descriptions, analysis and demonstrations of knowledge are to be made in accordance with accepted industry standards and texts.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the development of Human Factors and the emergence of Crew Resource Management.

Performance criteria

- 1.1 A historical analysis of the development of Human Factors is demonstrated.
- Range ergonomics should include – anthropology, engineering, physiology, psychology.
- 1.2 Knowledge of Human Factors are demonstrated to recognised incidents and accidents.
- Range Human Factors defined within the SHEL model.
- 1.3 Knowledge of the emergence of Company Resource Management as an accepted tool and its evolution is demonstrated.

Outcome 2

Demonstrate knowledge of information processing and decision-making in the context of an ultra safe industry.

Performance criteria

- 2.1 Information processing is explained.
- Range explanation may include – perception processes, basic physiology of sensors, attention, memory and pattern recognition.
- 2.2 Decision-making is explained.
- 2.3 Threats to decision-making are identified using examples.
- 2.4 Systematic problem-solving models are identified and explained.
- Range explanation must incorporate a minimum of two interactive examples of use.
- 2.5 The need for Crew Resource Management countermeasures to become an integral part of operating practice is described using examples.
- Range examples must be real and show contradicting approaches.

Outcome 3

Demonstrate basic knowledge of the threats to communication in the aviation environment.

Performance criteria

- 3.1 Perception in communication and the process of communication in an aviation environment are explained.
- 3.2 Effective communication principles are described.
- Range questioning, listening, understanding, delivery.
- 3.3 Barriers to communication in an aviation environment are described in terms of the SHEL.

Outcome 4

Demonstrate knowledge of the effects of stress on the individual Liveware component of the SHEL model.

Performance criteria

- 4.1 Stress is described.
- Range description may include – definitions and basic models of arousal, cause and effect.
- 4.2 The effects of stress on human performance are described.
- 4.3 Management of stress as a countermeasure is described.
- Range defence mechanisms, coping strategies, stress management processes.

Outcome 5

Demonstrate knowledge of the principal theories behind Threat and Error Management and identify skill-based tools utilised as countermeasures.

Performance criteria

- 5.1 Threat and Error Management is defined and described.
- Range description may include – definition of a threat, definition of an error, definition of an accident, the role of Human Factors in accidents.
- 5.2 Countermeasures of Threat and Error Management that incorporate relevant threat and error models are described.
- Range decision-making models, Company Resource Management, avoidance trapping and mitigating error, information processing influenced by cognitive processes.

- 5.3 Knowledge of Threat and Error Management within a team is demonstrated to recognised incidents and accidents.

Outcome 6

Explain teamwork in a multicrew environment.

Performance criteria

- 6.1 Teamwork in a multicrew environment is explained.

Range concepts of effective teamwork, examples of poor teamwork, accident events and limitations of the individual Liveware component when affected by concepts of conformance, lack of authority or leadership skills, risky shift.

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| Planned review date | 31 December 2025 |
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Status information and last date for assessment for superseded versions

| Process | Version | Date | Last Date for Assessment |
|-----------------------|---------|-----------------|--------------------------|
| Registration | 1 | 22 August 2005 | 31 December 2020 |
| Review | 2 | 9 December 2010 | 31 December 2020 |
| Review | 3 | 26 April 2018 | N/A |
| Rollover and Revision | 4 | 25 May 2023 | N/A |

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| Consent and Moderation Requirements (CMR) reference | 0028 |
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This CMR can be accessed at <http://www.nzqa.govt.nz/framework/search/index.do>.

Comments on this unit standard

Please contact Ringa Hora Services Workforce Development Council qualifications@ringahora.nz if you wish to suggest changes to the content of this unit standard.