

Maintenance Environment Survey (MES – 3rd Version): A Scale to Measure Safety Climate,
Fatigue, Stress, Violations and Errors

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This is an instrument that was used to measure safety climate, fatigue, stress, violations and errors in an aviation maintenance setting. Researchers are welcome to use the questionnaire or any part of it, provided that due acknowledgements are made.

The relevant citation for the validation research is:

Fogarty, G. J. & Buikstra, E. (2008). A test of direct and indirect pathways linking safety climate, psychological health, and unsafe behaviours. *International Journal of Applied Aviation Studies*, 8 (2), 199-210.

A copy of this paper can be downloaded at:

<http://eprints.usq.edu.au/4862/>

The paper contains information relating to response format for the various items. The paper does not contain descriptive statistics or correlations, so these are reproduced below.

If you need anything further, please contact me via email: fogarty@usq.edu.au.

Summary Statistics for Safety Climate and Violation Behaviour Variables (N = 308)

	<i>M</i>	<i>SD</i>	No. of Items	α
Management Support	3.42	.77	3	.82
Safety Commitment	4.12	.56	4	.79
Management Awareness	2.72	.84	3	.87
Communication	3.30	.78	3	.85
Resources	4.12	.66	4	.85
Training	3.24	.58	7	.54
Workload	3.10	.64	5	.81
Stress	2.66	.65	5	.79
Fatigue	2.52	.73	4	.72
Violation Behaviour	2.01	.68	5	.81
Violation Attitude	2.18	.80	4	.85
Error Cause	2.19	.56	10	.90
Error Type	1.78	.45	10	.86
Mistakes	2.20	.58	4	.82

Correlations Among Scales (N = 308)

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Management Support													
2. Safety Commitment	.27												
3. Managem't Awareness	-.34	-.25											
4. Communication	.54	.22	-.31										
5. Resources	.32	.22	-.34	.25									
6. Training	.38	.23	-.28	.33	.31								
7. Workload	-.24	-.14	.25	-.34	-.18	-.34							
8. Stress	-.31	-.20	.29	-.29	-.29	-.39	.42						
9. Fatigue	-.27	-.15	.25	-.31	-.28	-.33	.28	.59					
10. Violation Behaviour	-.49	-.23	.46	-.27	-.38	-.31	.31	.33	.30				
11. Violation Attitude	-.35	-.23	.31	-.25	-.33	-.33	.29	.29	.27	.56			
12. Error Cause	-.32	-.27	.35	-.29	-.32	-.38	.29	.55	.48	.43	.37		
13. Error Type	-.17	-.23	.24	-.18	-.27	-.21	.19	.25	.25	.40	.26	.56	
14. Mistakes	-.29	-.20	.29	-.23	-.36	-.40	.24	.40	.33	.37	.33	.60	.46

Scales and Items forming the Maintenance Environment Survey (3rd Version)

Management Support

Managers listen to concerns from tradesmen/supervisors and react appropriately.

Supervisors listen to concerns from tradesmen and react appropriately.

Supervisors are supported by managers when they make a decision that adversely impacts the flying programme or task deadline.

Safety Commitment

My colleagues are committed to flying safety.

My colleagues understand the role of maintenance with respect to flying safety.

Management in my workplace is committed to flying safety.

The ADF is committed to flying safety.

Management Awareness

Supervisors are aware that the pressure placed on tradesmen makes it necessary to take shortcuts/risks to achieve the task.

Managers are aware that the pressure placed on supervisors makes it necessary to take short cuts/risks to achieve the task.

Managers accept that supervisors need to take short cuts/ risks in the workplace to achieve the task.

Communication

Management communicate issues effectively to tradesmen and NCOs.

Management communicate issues effectively to SNCOs.

SNCOs are effective in communicating issues from management to tradesmen and NCOs.

Resources

I have access to the necessary personal protective clothing/equipment that I need to carry out assigned tasks.

I have access to the necessary tools that I need to carry out assigned tasks.

I have access to the necessary test equipment that I need to carry out assigned tasks.

I have ready access to the relevant local standing instructions that I need to do my job.

Training

The trade skills of junior personnel are adequate.

Following formal training, I received adequate on-the-job training before being authorised to complete/certify applicable tasks.

On-the-job training is a high priority in my unit.

It is hard to provide time for effective on-the-job training because of pressure to meet operational deadlines.

Tasking within my unit is balanced against available human resources.

I have a good "systems knowledge" of the equipment that I work on.

My colleagues have a good "systems knowledge" of the equipment that they work on.

Workload

I undertake tasks concurrently to get the job done.

Supervisors undertake tasks concurrently to get the job done.

I get interrupted or distracted whilst performing a task, including being reassigned to another task.

The team is split to enable tasks to be undertaken concurrently.

I have to improvise, when doing my job, because of inadequate resources.

Stress/Strain

How often do you feel stressed at work because of:

The task itself?

Others at work?

Secondary/additional duties?

Work related issues/uncertainties?

Problems outside work?

Fatigue

How often do you feel fatigued at work because of:

The working hours?

The shift arrangements?

Young family members sleep patterns?

Other issues/activities outside work?

Violation Behaviour

I will temporarily disconnect or remove a part to make a job easier, but not document the disconnection/removal.

Supervisors are prepared to sign for maintenance, trusting a tradesmen's competence, without performing the required supervision or inspection.

Managers turn a blind eye to short cuts/risk taking by supervisors if the flying programme or task deadline is met.

When given a task, I ensure that approved procedures are followed.

"Good guts books" are used in lieu of the publication or manual.

Violation Attitude

Shortcuts are necessary in order to get a task done.

It is necessary for me to take risks, other than those inherent in my job, in order to get a task done.

In my job there is a trade off between getting the task completed and doing it by the book.

Where I work, tasks are performed in accordance with maintenance policy, process and procedure.

Error Type

I have missed out steps in maintenance tasks.

I have resumed at the wrong place when returning to a task after an interruption.

I have lost a component part-way through a job.

I have failed to detect a fault when completing a visual inspection.

I have forgotten to check that all steps in a procedure were completed.

I have forgotten to sign off a task.

I have left a tool or some other item in an aircraft.

I have installed a part the wrong way.

I have found a part left over after a job was completed.

I have had difficulty with a task because I misunderstood how a particular aircraft system worked.

Error Causes

I make errors because of stress.

I make errors because of distractions.

I make errors because of tiredness.

I make errors because of time pressure.

I make errors because I have too many things to do.

I make errors because of lack of concentration.

I make errors because of lack of knowledge.

I make errors because of forgetfulness.

I make errors because of the physical conditions under which I work (e.g., poor lighting).

I make errors because I don't have the right tools.

Mistakes

My colleagues make mistakes because their systems knowledge is lacking.

I make mistakes because my systems knowledge is lacking.

My colleagues make mistakes because their trade skills/knowledge is lacking.

I make mistakes because I haven't been shown how to do the work.