

**Minutes of the Technical Advisory Board for Mechanical Environments of the
Confederation for European Environmental Engineering Societies
Held on 16th September 2004 at Stockholm, Sweden**

Present at the Meeting of the Technical Advisory Board for Mechanical Environments (TABME) were;

Mr K Ahlin	SEES
Dr U. Braunmiller	GUS
Mz C Jarlfors	SEES
Mr G Jansson	SEES
Mr M. Juntunen	KOTEL
Mr. D. Richards	SEE (Chairman)
Mr E Schneider	GUS
Prof H Torstensson	SEES
Mr T. Trost	SEES
Dr K Zieghan	GUS

Matters Arising

Apologies were received from Mr Ad Van Dorp (PLOT), Mr M. Dumelin (SSEE). A list of TABME members, including corresponding members, was circulated. As usual this list is attached to the minutes as Attachment No 1.

Systematisation of Measurement Methodologies

STANAG 4370. It was reported that the next meeting was to be held in Germany (to be followed by a GUS workshop) within a few weeks of the CEEES meeting. The group were reminded that copies of the final draft of STANAG 4370 version 3 were commonly available (CD copies of this were circulated to the CEN EG10).

Mil Std 810F Karl reported on a presentation to be made by Skip Connon on the future of Mil Std 810, at the upcoming GUS workshop. Again the group were reminded that change note 3 was available on the web. {Chairman's note; the web address is: http://assist.daps.dla.mil/eAccess/index.cfm?ident_number=35978 }.

IEC TC104. It was reported that the maintenance teams of IEC TC 104 were continuing to work. The new mixed mode test had been circulated as a CDV draft for comment (due date had expired just before CEEES meeting).

DIN 30787. The next meeting of this group as scheduled for the end of September. The collection of climatic transportation loads is still ongoing. The first part of the DIN will include how to collect data, the second measured data. Karl asked the group if they had any suitable data. A discussion on this then occurred. It was further reported that in support of 30788 / 30789 information from the former GDR had been reviewed. This included a lot of measurements made during sea transportation. This appeared to include very good climatic data but not so good vibration data.

CEN TC 261 SC5 WG14 – Test Methods & Test Schedules . This group had been effectively dormant for some time. However, a new chairman had been found (from SURFIT) and the next meeting would take place in London the week after the CEEES meeting. Ulrich, Thomas and David intended attending this meeting to present the SRETS work as well as the DIN standard. Karl reported that an e-mail had been sent out asking for support of this committee which is looking at using the above DIN's as the basis for a CEN standard. Currently this was accepted as a new work item but so far insufficient countries had nominated an expert for it to go ahead, however, lobbying continues.

UN Orange Book. Once again it is rumoured that the US / Spanish proposal for the inclusion of a vibration test had been accepted by the responsible technical group.

SRETS. A brief discussion of the SRETS work occurred for the benefit of new members.

Report from Karl on Meeting with Skip Connon. Karl said that the discussions with Skip Connon that he reported at the last meeting was to be followed up with a workshop arranged by GUS.

Overview At a previous meeting the group had generated an overview of European and International work currently underway relating to transportation stresses. That overview was included as an attachment in the minutes of the last meeting. This meeting reviewed and updated the chart. The updated version is include here as attachment No 2. [Chairman's note: It is intended to review this chart on a regular basis.]

CEN WS 10 EG 8 (Workshop on Defence Procurement). At the last meeting Karl had confirmed that CEN WS10 had set up several Expert Groups one of which was EG8 on environmental testing. Karl was the chair of that group and several TABME / CEEES members were also delegates. The first full meeting had occurred the day before the February CEEES meeting and since then a further four meetings had occurred. Karl gave a brief overview of the progress of the group and the programme to achieve a report making recommendations by the end of the year. Several aspects of interest to the TABME which had emanated from the work of EG8 were discussed. A recently published document setting out the formal hierarchy of standards to be used by the UK was presented to the group. This hierarchy, which is attached, is essentially identical to that adopted recently by several countries. A group of standards that had been included in the work of the EG was ITOPS. A brief explanation of these were given to the group. Whilst, the full of ITOPS is attached, only around 10 relate to environmental aspects. These have been supplied to the EG 8 delegates.

Technical Papers - Working Practices

During previous discussions it became apparent that the paper needed an overview. It was agreed and the working practices would need an overview of the larger process. It was further suggested that this could follow the same process as that of a paper by Markku viz. Environmental Test Tailoring Management plan, Life Cycle, Environmental Conditions, Derivation of Test Specification. Markku had undertaken to prepare an overview for the paper, he passed this over at the meeting. It is intended that this be circulated for review at the next TABME meeting.

Karl had obtained a paper by Skip Connon which was quite similar to that been prepared by the TABME. In order to complete the current work it was proposed that the existing paper be completed in its current form as soon as possible. In order to include a useful example to the paper, the chairman had been considering several options. It was proposed that data from (a UK operated) C17 aircraft could form an appropriate database from which examples could be extracted. A presentation of the scope of the available data was made to the TABME by the chairman (attached). It was possible that the database of the C17 analysis could be put into the public domain.

The chairman undertook to prepare a modified version of the existing paper and circulate for additional input.

Topics for Future Consideration

The members of the TABME identified a number of potential future topics for future consideration;

Basic techniques for data collection / analysis.

FDS / MRS - Potential variations between different methods.

Test tailoring – “25 Years of test tailoring” and “How do other people do it?”

Fatigue Presentation

At the previous meeting Thomas Trost had asked whether a discussion on Fatigue analysis software could be included. A brief presentation was made by David Richards (attached).

CEEES Website

A brief description of each of the TABME members was circulated after the last meeting. It was intended that this should go on the CEEES website. This was discussed and a number of changes proposed. The latest version is included as Attachment 7.

Any Other Business

Karl reminded the meeting about the 3rd Nuremburg conference scheduled for May 11th/ 12th 2005. Fliers for this and a call for papers are now available.

Karl reported that the packaging directive was under review. However, it will still require the reduction of packaging waste at source.

Karl reported that GUS had made deliberate attempts to encompass the environmental considerations of windpower. Some IEC standards are now available but do not include test severities for components. Wind turbines experience a significant mix of severe environments. Karl suggested this may be a useful future subject for TABME and CEEES.

The possibility of a CEN workshop agreement on transportation environments was again raised. The group were gain useful experience by the current involvement in the Defence Procurement workshop agreement. A transportation workshop would require a business case to be developed.

Thomas Trost asked about a follow up to the “Best Practice” bid for EU funds made by CEEES at the previous meeting (the group thanked the significant contribution from GUS and particularly ICT). This was further reported at the main CEEES meeting.

Next Meeting

The date of the next meeting of the TABME is planned for 17th February 2005 in Brussels.

Attachments

- 1 Names and Addresses of TAMBE Members
- 2 An Overview of European and International work
- 3 Hierarchy of Defence Standards
- 4 List of ITOPS
- 5 Scope of C17 Database.
- 6 Fatigue Presentation by David Richards
- 7 TABME Membership (proposed for website)

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An Overview of European and International work

Group / Standard	Connection with CEEES Working Group	Other Connections
ISO – TC 108 wg 26 &27		Kjell Ahlin
ISO – TC 122	Thomas Trost	
ISO - Railway		
IEC TC 104	David Richards Aad Van Dorp Markus Dumelin Markku Juntunen	
CEN TC 261	Ulrich Braunmiller Thomas Trost	
CEN TC 320 Transportation Services		Soren Ostergaard
DIN 30787 NAVP 1.4	Ulrich Braunmiller Karl Zieghan	Ed Furrer
BSI	David Richards	
UN Orange Book		
Mil Std 810		Skip Connon
Nato Standard - AC310		David Richards
Nato Standard - AC301	Markus Dumelin	Peter van Harmelen David Richards
Nato Standard - ITOPS		
CEN Workshop Agreement Defence Procurement WS10	Karl Zieghan	David Richards Goran Jansson Markku Juntunen
IEC Railways		Odd Sylwan

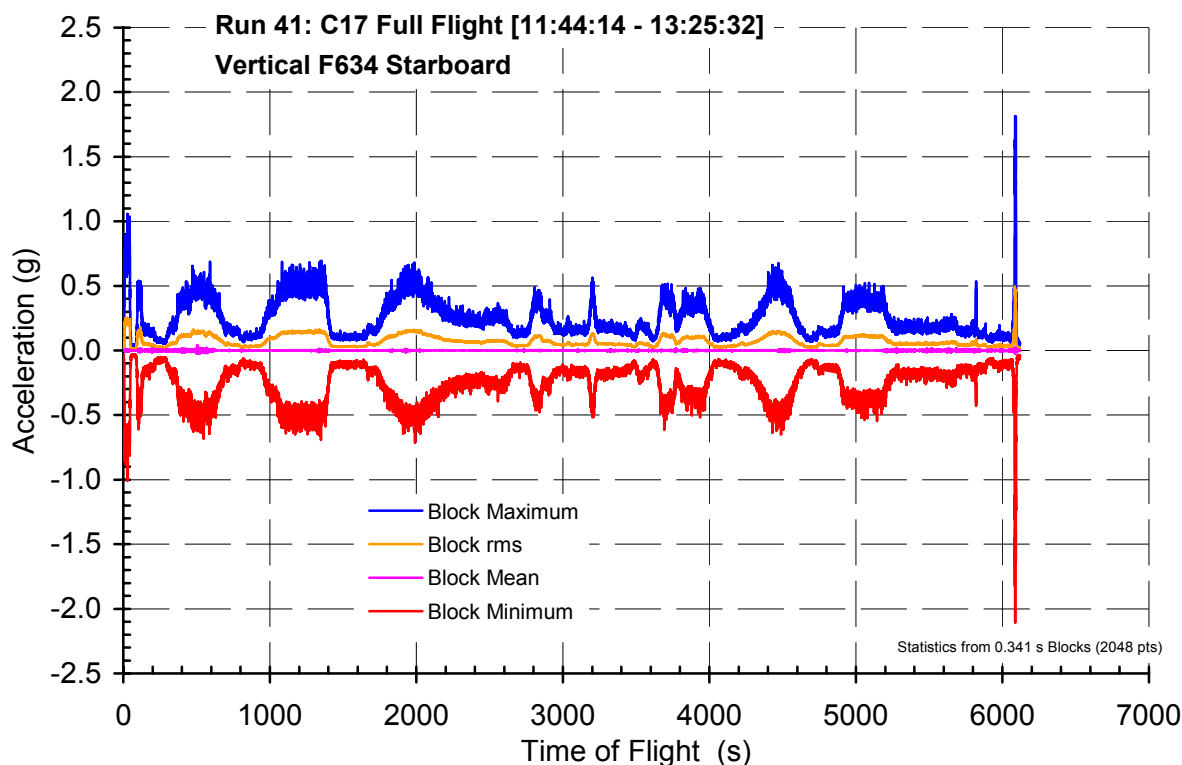
Vibration Measurements on C17A (Globemaster) Cargo Bay Floor.

Measurements made on aircraft ZZ172 on lease to UK. Data are from single flight from RAF Brize Norton in June 2003.

The C17 Cargo bay floor payload positions are, in the fore/aft direction from station 347 to 1165. Behind the cargo bay floors extends the rear ramp / door which runs from stations 1165 to 1403. The station values are inches aft of aircraft reference. The line of the aircraft engine intakes is at station 634. Measurements were made at stations 487, 634, 784, 933, 1067 and 1260. The latter is on the ramp and the measurements were made normal to ramp floor.

Widthwise the cargo bay has 7 rows of tie down points (designated A to G) at stations +101, +75, +33, 0, -33, -75 -101 respectively (positive stations on port side). The station values are inches either of aircraft centre line. Measurements were made on tie down rows B (Port), D (centre line) and F (starboard)

Measurement locations referred to are mostly on cargo bay floor. Those measurements were made 2 sixteen channel recorders (designated recorder C and D). One channel on each recorder was a dummy transducer giving noise levels. Additionally two channels were on a payload pallet tied down on the ADS rails. The transducer was approximately fore/ aft station 634 and widthwise at station +20 (on the port side). Measurements at the cockpit reference are also included.



Run 1: C17 Auxiliary Power Unit start [10:30:00 - 10:30:55]
Run 2: C17 Auxiliary Power Unit running [10:31:21 - 10:31:51]
Run 3: C17 Static engine 1 start and running [11:04:05 - 11:05:56]
Run 4: C17 Static engine 2 start and running [11:05:56 - 11:08:10]
Run 5: C17 Static engine 3 start and running [11:08:26 - 11:10:05]
Run 6: C17 Static engine 4 start and running [11:10:05 - 11:10:40]
Run 7: C17 Static engine reverse idle [11:23:45 - 11:23:55]
Run 8: C17 Full power ground run [11:44:14 - 11:44:44]
Run 9: C17 Normal Taxi [11:32:27 - 11:34:57]
Run 10: C17 Take-off [11:45:37 - 11:46:01]
Run 11: C17 Climb to 2000ft [11:46:20 - 11:48:00]
Run 12: C17 Straight and Level, 200kts, 2000ft [11:48:00 - 11:48:46]
Run 13: C17 Straight and Level, 250kts, 2000ft [11:49:28 - 11:50:01]
Run 14: C17 Straight and Level, 300kts, 2000ft [11:50:56 - 11:51:26]
Run 15: C17 Straight and Level, (Vne-10), 2000ft [11:52:13 - 11:52:43]
Run 16: C17 Straight and Level, 210kts, 15000ft [11:57:52 - 11:58:22]
Run 17: C17 Straight and Level, 250kts, 15000ft [11:59:12 - 11:59:42]
Run 18: C17 Straight and Level, 300kts, 15000ft [12:00:42 - 12:01:12]
Run 19: C17 Straight and Level, (Vne-10), 15000ft [12:02:09 - 12:02:39]
Run 20: C17 Straight and Level, (V _{mma} +10), 25000ft [12:10:41 - 12:11:11]
Run 21: C17 Straight and Level, 300kts, 25000ft [12:14:16 - 12:14:46]
Run 22: C17 Straight and Level, (Vne-10), 25000ft [12:16:14 - 12:16:44]
Run 23: C17 Straight and Level, 250kts, 25000ft [12:12:17 - 12:12:47]
Run 24: C17 Straight and Level, (V _{mma} +10), 37000ft [12:28:41 - 12:29:11]
Run 25: C17 Straight and Level, (Vne-10), 37000ft [12:26:43 - 12:27:13]
Run 26: C17 Rapid descent, not > Vne-10 to 25000ft [12:30:45 - 12:31:19]
Run 27: C17 Slow accel / decel at 25000ft [12:52:40 - 13:02:15]
Run 28: C17 1 g Steep Turn to right [12:34:08 - 12:34:34]
Run 29: C17 1 g Steep Turn to left [12:36:40 - 12:37:10]
Run 30: C17 1g Steep Turn to left recovery [12:37:10 - 12:37:34]
Run 31: C17 1.5 g Steep Turn to right [12:39:09 - 12:39:39]
Run 32: C17 1.5 g Steep Turn to left [12:41:31 - 12:42:01]
Run 33: C17 2 g Steep Turn to right [12:49:16 - 12:49:46]
Run 34: C17 2 g Steep Turn to left [12:46:22 - 12:46:40]
Run 35: C17 Turbulence [12:06:31 - 12:07:31]
Run 36: C17 Normal descent [13:08:27 - 13:09:27]
Run 37: C17 Landing [13:25:15 - 13:25:24]
Run 38: C17 Reverse Thrust [13:25:25 - 13:25:32]
Run 39: C17 Reverse Taxi [11:35:49 - 11:36:26]
Run 40: C17 Pull Forward [11:25:29 - 11:30:21]
Run 41: C17 Full Flight [11:44:14 - 13:25:32]
Run 42: C17 Full Power, Take-off & initial Climb [11:44:14 - 11:47:20]
Run 43: C17 Normal descent, Landing & Reverse Thrust [13:23:35 - 13:25:32]

CEES Technical Advisory Board for Mechanical Environments
Attachment No 5

Channel C1 Vertical Port Bottom Container
Channel C2 Lateral Port Bottom Container
Channel C3 Vertical F634 Starboard
Channel C4 Lateral F634 Starboard
Channel C5 Longitudinal F634 Starboard
Channel C6 Vertical F634 Port
Channel C7 Lateral F634 Port
Channel C8 Longitudinal F634 Port
Channel C9 Vertical F487 Starboard
Channel C10 Lateral F487 Starboard
Channel C11 Vertical F784 Starboard
Channel C12 Lateral F784 Starboard
Channel C13 Vertical Cockpit Reference
Channel C14 Lateral Cockpit Reference
Channel C15 Longitudinal Cockpit Reference
Channel C16 Dummy
Channel D1 Vertical F634 Starboard
Channel D2 Lateral F634 Starboard
Channel D3 Vertical F634 Centre
Channel D4 Lateral F634 Centre
Channel D5 Longitudinal F634 Centre
Channel D6 Vertical F933 Starboard
Channel D7 Lateral F933 Starboard
Channel D8 Lateral F933 Centre
Channel D9 Vertical F933 Centre
Channel D10 Vertical F1067 Starboard
Channel D11 Lateral F1067 Starboard
Channel D12 Longitudinal F1067 Starboard
Channel D13 Vertical F1260 Starboard
Channel D14 Lateral F1260 Starboard
Channel D15 Longitudinal F1260 Starboard
Channel D16 Dummy