

**Minutes of the 3rd VAMAS TWA26 meeting,
SEM Conference, Tuesday 5th June 2001, Portland, Oregon, USA**

Attendees

Eann Patterson	University of Sheffield
Yoshiharu Morimoto	Wakayama University
Satoru Yoneyama	Wakayama University
Yoshihiro Yamashita	Hitachi Ltd
Rachel Tomlinson	University of Sheffield
Darren Hughes	University of Salford
Steve McNeill	University of South Carolina
Arup Maji	University of New Mexico
David Read	NIST
Ron Slaminko	Boeing
Albert Cardon	Univ. of Brussels (V.U.B)
Masahisa Takashi	Aoyama G. Univ. (Japan)
Arkady Voloshin	Lehigh U.
Wei-Chung Wang	National Tsing Hua University (Taiwan)
Steve Lubowinski	Wilsonart International
Huai Min Shang	National University of Singapore
Michel Taroni	SNECMA
Susan Foss	Deese & Co. Technical Centre
Bill Hardrath	Boeing Commercial Airplanes
Richard Burguete	Airbus

Outline

A TWA26 meeting was held at the SEM conference in Portland, Oregon, USA on Tuesday 5th June 2001. The agenda for the meeting was as follows:

Introductions	Dr Richard Burguete Prof Eann Patterson
ASTM E08 - Standard guide for evaluating non-contacting optical strain measurement	Prof Mike Sutton
Activities on standardisation of full-field optical stress and strain measurement methods in Japan	Prof. Yoshihari Morimoto
The SPOTS initiative in Europe	Prof. Eann Patterson
New projects	Dr Richard Burguete
Discussion	All
Future meetings	

1. Introductions

An outline of the aims of the meeting was presented.

The rationale for the development of standards is based on the massive expansion in full field optical stress and strain measurement which are potentially VERY valuable to industry. Optical non-contact methods readily applied to complex problems with

high measurement and spatial resolution. **Standards will enhance acceptance of results.** The current status is that no international standards for procedures, materials or equipment exist. Some acceptance of methods for certification in aerospace and some examples of best practice e.g. Measurements Group's Tech Notes & Instruction Bulletins and BSSM Code of practice.

The aims of VAMAS are therefore the development of test methods, the comparison of test results, the production of reference materials, the establishment of databases of material properties and the agreement of nomenclature. It is also important that acceptance by standards and certification authorities is more generally applied. This will enhance the profile for optical methods by increasing industrial usage, leading to funding for further research.

The route to standardisation is an enormous project which include Pre-normative research and the preparation of standards. Optical methods share much technology, exploitation of this will lead to a more efficient route to standardisation. Distribution of labour across nations and reduced duplication of effort will improve chances of funding

The modus operandum will be the generation of documentation and guidelines from VAMAS (See VAMAS web site: www.vamas.org and VAMAS secretariat email: vamas@nist.gov). The structure of TWA will be made up of Project coordinator: (richard.burquete@baesystems.com), Project participants (see website: www.twa26.org) All requests for information/help to follow the following route: Chair/Co-chair → TWA steering committee → VAMAS steering committee

2. ASTM E08

In 1998 Mike Sutton was asked by Dr. George Lucas (formerly chairperson for an NDE subdivision of ASTM and a manager at MTS Corporation) to give a talk at the E28 subcommittee on calibration issues for non-contacting methods. This talk was repeated, along with a discussion of approaches to begin developing the proper format to compare methods, at the spring meeting of 1999. A small task force was set up (E08.03.03), with Peter McKeighan as co-chair, to draft a Standard Guide. This was completed in the fall, 1999 (primarily by Prof Sutton and the group at the University of South Carolina) using the existing ASTM format as a guide. The revised document was presented to the subcommittee at the November 1999 meeting. After modifications, it was approved for submission as a full ASTM ballot at the May 2000 meeting.

The Draft Standard Guide was balloted in the summer/fall of 2000 and apparently approved without negative ballots, eventually being sent out for publishing as an ASTM Standard Guide in the spring, 2001. Unfortunately, it was learned in April 2001, that one negative ballot had been received (from Dr. Joseph Sanford at U Maryland) during balloting and for unknown reasons the ASTM staff had not informed either Dr. McKeighan or myself of this ballot.

I immediately responded directly to Dr. Sanford via email, identifying each of his concerns and discussing at length why the Standard Guide actually meets all of his requirements. I then called Dr. Sanford and discussed the issues. As of this email, no response has been forthcoming from Dr. Sanford. Of course, the goal is to reballot the standard in the fall of 2001, provided we can get agreement from Dr. Sanford concerning the issues he raised. Once this standard guide is in place, it allows everyone to compare methods based on the *same* terminology, providing a solid basis for determining which methods are best suited for a specific application.

3. Standardisation activities in Japan

Currently standards exist for strain gauge methods, no standards for full-field optical methods. Activities of TWA 26 presented at JSNDI 32nd Symposium on stress-strain measurement and strength evaluation (Jan 2001) and at JSME-MMD 2001 Spring symposium (March 2001). A full session was held at the JSEM annual conference (28-29 June 2001) covering the present situation in Japan with regard to the standardisation of full-field optical methods. Japan Society for Photoelasticity renamed Japan Society for Experimental Mechanics (JSEM) and the Standardisation of Full-field Optical Stress and Strain Measurement division has been established within the JSEM under the chairmanship of Prof Morimoto.

Results of questionnaire on optical stress and strain measurement method use was presented. Data was gathered at JSME-MMD and through the JSME website. There is currently little interest in standards in many Japanese companies. The Japan division of TWA26 will continue to disseminate the activities of TWA 26 and promote the importance of standardisation in Japan.

Life extension of Japanese nuclear power plants from 40 to 60 years has required more rigorous and sensitive inspection regime. Laser methods are being developed and used for flaw detection and sizing. The importance of reliable and verifiable data is obvious and standardisation is the main way to realise this.

4. The SPOTS initiative in Europe

An Expression of Interest was submitted by Eann Patterson to the EU in response to the 5th Dedicated call (*Call identifier: GROW /DC5MTI*). This was successful and lead to a dedicated call under 'I. MEASUREMENT AND TESTING; (i) Methodologies to support standardisation and Community policies; *Pre-normative topics: Optical techniques for strain measurement (topic V.15)*'. A consortium of 10 submitted a proposal (co-ordinated by Eann Patterson), the results of which will be announced soon. It must also be assumed that the success of the EOI has in part resulted from the registration to CEN/STAR for prioritisation of Co-normative and Pre-normative research.

5. Proposed/Future projects

All those present were encouraged to submit new projects.

The following project proposals are being drafted and are being discussed. The first is due for ratification in May 2002 by the group that will be carrying out the work. The proposal for the second project is currently being prepared.

The ASTM Standard guide for evaluation of non-contacting optical strain measurement systems. A project initiation form has been drafted and will be discussed at the next meeting of task group E08.03.03. This meeting will be held in Pittsburgh on 6th May 2002. Dr Peter McKeighan has agreed to add this to the agenda for the meeting and a country co-ordinator for the USA will be appointed if he is forthcoming. It is intended that a more formal link between this ASTM group and VAMAS is established. The letter of invitation to this meeting is attached.

6. Discussion

A number of topics were covered, the first was resistance to the effort of standardisation. This was considered to arise from a number of causes, namely; standards are not necessary as many people are performing perfectly satisfactory analyses at present, it will be difficult to get industrial users to divulge their proprietary methods.

7. Future meetings

SEM Annual Conference, June 10-12, 2002, Milwaukee, Wisconsin USA

BSSM International Conference on Advances in Experimental Mechanics 27-29
August 2002 Moat House Hotel, Stratford upon Avon