

Minutes

**PTC #60 Committee on Verification and Validation
In Computational Solid Mechanics**

Monday, November 12, 2001

**Sheraton New York Hotel
811 7th Avenue @ 52nd St.
New York, NY**

Liberty Suite 5 – 3rd Floor

01-01 Call to Order

The meeting was called to order by the Chairman, Dr. Leonard Schwer, at 9:01 A.M.

Attendance

Members Present

Leonard E. Schwer – Chairman
Alan J. Roby – Secretary
John A. Cafeo
John H. Fortna
James K. Gran
Timothy K. Hasselman
Ahmed Noor
William L. Oberkampf
Dale K. Pace
Thomas L. Paez
Allan B. Pifko
J.N. Reddy
Paul E. Senseny
Mark S. Shephard
Donald A. Simons
Ben Thacker
Ren-Jye Yang

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Members Absent

Hans U. Mair
Ted Belytschko
Daniel J. Chwirut
George T. Gray, III
Hyoung M. Kim
J. Tinsley Oden
Michael Ortiz
Patrick J. Roache
Sunil Saigal
Timothy G. Trucano

Visitors

Scott Doebling	Los Alamos National Laboratory
Howard Levine	Weldlinger Associates, Inc.
Roger W. Logan	Lawrence Livermore National Laboratory
Lance Proctor	MSC Software
Patrick Smolinski	University of Pittsburgh

01-02 Adoption of the Agenda – 11/12/01

The Agenda was adopted as presented.

01-03 Announcements

The ASME Board on Performance Test Codes, under their Letter Ballot #01-07 approved the name, charter, and membership of the new standards committee. The ASME Council on Codes and Standards at their meeting of 9/21/01 endorsed the Charter.

The Committee's official title is:

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The Committee's Charter is:

To develop standards for assessing the correctness and credibility of modeling and simulation in computational solid mechanics

01-04 Membership

Committee membership was approved under PTC Board Letter Ballot #01-07 although the balance required under PTC Procedures, 3.2, was not achieved. Discussion was held on Committee membership and Interest Classification. No further attempt for the moment will be made to adjust the Committee balance. Terms of membership are outlined in 3.1.3 of the PTC Procedures. Scheduling for future nominations, and elections, was discussed, and the Chair suggested that proposals for changes to membership will be made prior to the next PTC 60 Committee meeting.

PTC Board members John M. (Jack) Burns and W.G. Steele, Jr. have been designated as liaisons to the Committee. These individuals visited the Committee to offer their welcome to ASME Codes and Standards activities.

01-05 Open Items

At the present time there are no active agenda items before the Committee.

A brief history of the activities of the Committee under USACM was given, as follows:

The Committee started as a US Association of Computational Mechanics (USACM) ad hoc Committee in August of 1999. The first meeting was held in November 1999 at the ASME/IMECE Nashville, TN. The second meeting was held in November 2000 at the ASME/IMECE in Orlando, FL. The third meeting was held in August 2001 at the USACM Congress in Dearborn, MI.

No critical topics from the last meeting (8/01) were presented. The transition of the Committee from USACM to ASME is now complete.

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A motion was made to accept the Minutes of the ad-hoc Committee's meeting of August 2001.

The PTC 60 Committee members **voted** their approval.

The Committee discussed the continuation of an existing web site, developed when the Committee was under USACM, and the creation of an ASME web page and bulletin board that will be maintained by ASME staff. Mr. Hans Mair will assist the Secretary in creating the ASME web page.

01-06 New Business

Symposium Activities - L. Schwer

It was reported that the International Association for Computational Mechanics (IACM) World Congress will meet in July 2002 in Vienna Austria. There will be 2 V & V minisymposia with about 14 presentations. Professor Nils Wiberg is organizing the European contributors, and Dr. Len Schwer is organizing the American contributors.

There will be a Foundations '02 Workshop in October 2002 at John Hopkins University in Maryland. There may be a joint session sponsored by the AIAA CFD V&V, and the PTC 60 V&V Committees.

Liaison Reports

a) Report on the AIAA CFD V & V Standards Committee – W. Oberkampf/L. Schwer

Dr. Oberkampf reported that there is support for a joint session at the Foundations '02 conference. There is a need for strong participation. A review will be made as to what AIAA staff will do.

It was noted that there was strong support for Dr. Schwer's proposal to Dr. Ray Cosner, Chair of the AIAA CFD V&V Committee, that the two Committee's cooperate to seeking VC&V funding. There is a possible joint funding effort for Benchmark and Validation. The CFD V&V Committee has a draft funding proposal. They are deciding where and when it will be submitted.

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The next AIAA CFD V&V meeting will be in January 2002 in Reno, NV. Both Committee's have extended invitations to attend each other's Committee meetings.

**b) Report on Ad-Hoc Biomechanical Standards Committee –
L. Schwer**

A new project has been approved by the ASME's Board on Safety Codes and Standards that will permit the creation of a new standards committee on biomechanical devices. ASME Secretarial support will be provided by Mr. Alan Roby.

The committee has not yet meet, but plans a meeting for early Spring 2002.

**Report on USACM Benchmark Student Paper Competition –
L. Schwer/J.N. Reddy**

It was reported that there is a need for analytical solutions (benchmarks). A proposal has been submitted to USACM for a student paper competition. The students will be asked to create benchmark problem problems and describe why they are good code verification benchmarks. The proposal was reviewed by the University of Texas at Austin Student Chapter.

It was noted that there is a need for non-classical benchmark problems. There also is a need to establish some criteria for development of the benchmarks and to guide the students.

Report on V & V Definitions Effort – J. Cafeo

It was reported that there is a need to determine a list of words and then define them to create a definitions document. There is also a need to compare and contrast.

The Committee felt that there is a need to include a Taxonomy of Errors (uncertainties).

A proposed list of words was offered, which may be expanded by the Committee members. The compiled list will be sent to Committee members for feedback.

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It was noted that when possible examples should be included, to illustrate the definitions.

See Appendix 01-06-1 for a copy of Mr. Cafeo's presentation made at the meeting.

<http://www.usacm.org/vnvcsm/Meetings/12Nov01/V&VDefinitions.pdf>

Report on Risk Assessment and Management – A. Noor

It was reported that Committee activity was discussed with NASA.

It was noted that there is ongoing work in the use of V & V on numerical simulations, such as:

- 1) Future engineering systems
- 2) Virtual product development
- 3) Non-traditional methods
- 4) System-of-systems
- 5) Managing uncertainty
- 6) Reliability and risk
- 7) V & V network

There was also discussion concerning characteristics of engineering systems, and of reliability.

The risk management process was also described.

Revised Sargent Circle Including Non-Determinism – W. Oberkamp

There was discussion as to what can be done to optimize the diagram.

See Appendix 01-06-2 for a copy of Dr. Oberkamp's presentation made at the meeting.

<http://www.usacm.org/vnvcsm/Meetings/12Nov01/Oberkampf-11-01.pdf>

Content of Initial Guidelines – L. Schwer

See Appendix 01-06-3 for a copy of Dr. Schwer's presentation made at the meeting.

<http://www.usacm.org/vnvcsm/Meetings/12Nov01/DraftGuide.pdf>

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A motion was made to accept the hierarchy of documents approach. The initial document will be approximately 20-30 pages in length, and subsequent documents will be more focused and detailed.

The PTC 60 Committee on V & V **voted** their approval.

Future Directions – L. Schwer

After some discussion it was determined that there would be four principal writers for the Guide. Mr. H. Mair, coordinator and lead writer, will write the Introduction and Terminology, Dr. Tim. Trucano will write Verification, Dr. Paul. Senseny will write Validation, and Dr. Scott Doebbling will write the Model Development section.

It was requested that the first drafts should be available by the end of January 2002.

01-07 Next Meeting

The next meeting will be held on Thursday, April 25, 2002 in conjunction with the 43rd AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference in Denver, CO. The meeting will be held from 9:00 A.M. – 6:00 P.M.

The subsequent meeting of the Committee will be held on Monday, October 21, 2002 in conjunction with the Foundations “02 Workshop to be held at the John Hopkins University Center in Laurel, MD.

01-07 Adjournment

The meeting was adjourned at 3:30 P.M.

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Action Items:

- Proposal for nominations and elections (Schwer)
- Committee web page under ASME banner (Mair)
- Joint Foundations '02 session with AIAA CFD V&V Committee (Schwer/Oberkampf)
- Joint V&V funding with AIAA CFD V&V Committee (Schwer/Oberkampf)
- Guidelines for USACM Student Benchmark Competition (Schwer/Reddy)
- V&V Definition Effort draft report (Cafeo/Roache)
- Revised Sargent Circle (Oberkampf)
- “Elements of V&V” draft sections (Mair, Trucano, Senseny, Doebling)
- Next meeting agenda and location (Mair/Thacker)

Respectfully submitted,

Alan Roby

Secretary; PTC 60 Committee on V & V

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encl.