Test Technology Standards Committee (IEEE-SA TTSC)

Meeting Minutes

October 20th, 2021

1 Name of group

The Test Technology Standards Committee (IEEE-SA Sponsor C/TT) met.

2 Date and location of meeting

Wednesday, October 20, 2021 and Wednesday, November 3, 2021, via IEEE Meetings WebEx (teleconference).

3 Officers

The presiding officer for the meeting on October 20th, 2021 was Ian McIntosh, TTSC Chair. The presiding officer for the meeting on November 3rd, 2021 was Adam Ley. TTSC Co-Chair. The recording secretary was Michael Wahl.

4 Attendance roster

The roll from October 20, 2021, was taken from the WebEx attendance list.

Adam Cron	Ian McIntosh (C)	Ric Dokken
Ananthashayana Mosale	Jason Peck	Saghir Shaik
Anthony Coyette	Jeff Rearick	Saman Adham
Bambang Suparjo	Jim O'Reilly	Steve Sunter
Bradford G. Van Treuren	Michael Wahl (S)	Tom Thompson (IEEE)
Heiko Ehrenberg	Mike Ricchetti	

The TTSC Vice Chair, Adam Ley, was excused.

The roll from November, 3, 2021, was taken from the WebEx attendance list.

Adam Cron	Jason Doege	Saman Adham
Adam Ley	Jeff Rearick	Sankaran Memno
Al Crouch	Jim O'Reilly	Steve Sunter
Bambang Suparjo	Michael Wahl (S)	Tom Thompson (IEEE)
Bradford G. Van Treuren	Mike Ricchetti	Tom Waayers
Greg Maston	Ric Dokken	
Ian McIntosh (C)	Saghir Shaik	

C: Chair, VC; Vice Chair, S: Secretary

5 Call to order, Chair's remarks

The meeting was called to order at: (EST) 11:04 AM, Wednesday, October 20, 2021. It was continued on (EST) 12:02 November 3rd, 2021.

5.1   Patent slides

The presiding officer shared the patent slide set and provided opportunity for those present to fulfill their duty to inform. None present identified any potentially essential patent claim(s)/patent application claim(s).

5.2   Copyright slides

The presiding officer shared the copyright slide set and provided opportunity for those present to comment. No comments were given.

6   Approval of the agenda

A motion for the approval of the agenda was made.

MOTION	Approval of the agenda
Mover	Adam Cron
Second	Bradford Van Treuren
Votes	No objections were raised.
Decision	Approved

7   Approval of minutes of previous meetings

7.1   Minutes from regular meeting, July 7th, 2021

MOTION	Approval of the minutes
Mover	Steve Sunter
Second	Adam Cron
Votes	No objections were raised.
Decision	Approved

7.2   Minutes from special meeting, August 19th, 2021

MOTION	Approval of the minutes
Mover	Steve Sunter
Second	Adam Cron
Votes	No objections were raised.
Decision	Approved

8   Action items review

	Action	Who	When
1	Organize a tiger team to work toward draft proposed common form letter for all calls for standard maintenance.	Ian McIntosh	Forthwith

	Action	Who	When
	Ian McIntosh reported that he sent out an e-mail to form a study group, but with little response. He suggested starting a study group for each standard requiring maintenance which could assess whether revision is required, define the scope of changes, and draft a PAR accordingly. A question arose over whether a study group existed for a minimum of 6 months or a maximum of 6 months. Ian Macintosh will check this. Bradford Van Treuren moved to make forming a study group to assess a revision TTSC policy. This might require amending the P&P. This will be addressed when the TTSC P&P is amended for 2022.		
2	Work toward draft proposed common P&P for all TTSC working groups on a staff-provided baseline and template. A draft of the P&P was placed on the iMeet server. There are still questions open, in particular to open-source issues. The members of the TTSC should comment on a short-term basis. The P&P for the TTSC need to be agreed upon first, and then the other P&Ps can be derived from this template (Tom Thompson).	Ian McIntosh	Forthwith
3	Request IEEE editors prepare Word source, on current template, for revision drafts to seed P1450.1. Draft has been sent.	Tom Thompson	Completed
4	Create "cookbook" for how to start up a new (or revision) project/working group. This is partly covered by Action 1. There is an "Officer's Handbook" section in the TTSC iMeet Central site that is slowly getting notes added.	Ian McIntosh	Forthwith
5	Communicate expectations concerning submission of WG rosters to IEEE-SA. Currently there is no guidance when and where the roster should be updated (Tom Thompson). It is required to update the rosters annually in myProject. It was suggested to update the rosters at the end of each year. The roster may be made publicly available, but only with name and affiliation of the members.	Tom Thompson	Forthwith

	Action	Who	When
6	Initiate working group for revising 1149.1 before the end of the year Using the policy proposed from Action 1, Heiko Ehrenberg would be the nominee chair for a study group to consider as revision PAR. Adam Ley was also suggested, but was not on the call to comment. Heiko will take this forward and raise a Call for Participation – may not be able to get this through IEEE Marketing, but Tom Thompson will enquire.	Ian McIntosh	Forthwith
7	Enquire whether IEEE editors can provide original image sources for P1450. Issues worked through, so action complete. Noted that text "figures" will be stored as bitmaps so are better if entered as tables in order to retain editability.	Tom Thompson	Completed

9 Technical Topics

9.1 Standards Committee action requested/required

Motion to approve the P&P for P1450

MOTION	Approval of the minutes
Mover	Ric Dokken
Second	Jim O'Reilly
Votes	No objections were raised.
Decision	Approved

Motion to approve the P&P for P1149.4

MOTION	Approval of the minutes
Mover	Bambang Suparjo
Second	Bradford Van Treuren
Votes	No objections were raised.
Decision	Approved

9.2 Elections review

9.2.1 P1450

Ric Dokken reported that the nomination period was closed. The elections are expected to be completed at the end of the year. The terms will start with the beginning of 2022.

9.2.2   P2427

The elections are ongoing until the end of this week.

9.2.3   P1149.4

Nominations closed on October 19th, 2021. The terms will start at the beginning of 2022.

9.3   Status of projects in active development

9.3.1   P1149.4

Bambang Suparjo: The group is in process of preparing the elections. The P&P have been approved.

9.3.2   P1149.7

Adam Ley: The ballot is in recirculation.

9.3.3   P1450.1

Greg Maston: not much action since last meeting.

9.3.4   P1450

Ric Dokken: Approximately 40% of the document has been reviewed. Work is in good progress.

9.3.5   P1450.6

Saghir Shaik: not much action since last meeting. Ian McIntosh offered to support Saghir. They agreed to have a private meeting. Ric Dokken stated that he has interest in participating in the working group and also offered support and participation in the private meeting.

9.3.6   P1450.6.2

Saman Adham: progressing nicely. Tiger teams are busy with weekly meetings.

9.3.7   P1500

Mike Ricchetti: Recirculation ballot will start before the end of the year. Mike expects that the standard can be published at the beginning of next year.

9.3.8   P1687.1

Al Crouch, Jeff Rearick, Bradford Van Treuren: Mostly working on the alignment to the other standards, defining generic mechanisms (transfer procedures) for 1687.1, 1687.2, and 2654. The architecture is viable, but there are still some technical issues. Biggest issue is the language, possibly C or C++. Ian McIntosh reminded everyone to the fact that the PAR expires at the end of 2022. It is planned to have the ballot well before the expiration.

9.3.9   P1687.2

Steve Sunter: Regular biweekly meetings, 25 people. Expected time for starting balloting is six months.

9.3.10 P2427

Anthony Coyette (written report is on the iMeet site): Similar state as P1687.2

9.3.11 P2654

Ian McIntosh: Draft is not as well developed as P1687.1. Possibly the PAR needs an extension. It is possible that the draft will be ready for ballot at the end of next year. The editor is missing, which causes additional delays.

9.3.12 P2929

Sankaran Menon: Weekly meetings, 20-24 people, progressing well.

9.4 Maintenance review

9.4.1 Without SC action, the following standards will expire at the end of 2022:

- 1149.8.1 C/TT/Boundary Scan Architecture
  IEEE Standard for Boundary-Scan-Based Stimulus of Interconnections to Passive and/or Active Components
  It is unclear if this standard still has a use. Suggestion that we should try asking the vendors of tools that might use 1149.8.1 if they are seeing any demand, e. g. Keysight, Teradyne.

9.4.2 Without SC action, the following standards will expire at the end of 2023:

- 1149.1 C/TT/Boundary Scan Architecture
  IEEE Standard for Test Access Port and Boundary-Scan Architecture
  Addressed by Action 6
  Heiko Ehrenberg has agreed to act as a study group chair.

At this point, and due to our allocated hour being up, Mike Ricchetti moved to re-convene the meeting at the same time on Wednesday 27th October. The proposal to amend the date to 3rd November was accepted by Mike and seconded by Saman Adham, no objections.

MOTION	Re-convene the meeting on November 3rd, 2021, same time.
Mover	Mike Richetti
Second	Saman Adham
Votes	No objections were raised.
Decision	Approved

9.4.3 Without SC action, the following standards will expire at the end of 2024:

- 1687 C/TT/IJTAG
  IEEE Standard for Access and Control of Instrumentation Embedded within a Semiconductor Device

About 20 pages of comments and suggestions for changing were collected by the editor, Jeff Rearick.

MOTION	Start a study group for the refresh of 1687 based on the original PAR.
Mover	Jeff Rearick
Second	Adam Cron
Votes	No objections were raised.
Decision	Approved

The result of the following discussion was that a study group can exist for at most 6 months. Jeff Rearick will take the lead of the group.

9.4.4   Without SC action, the following standards will expire at the end of 2025:

- 1149.6 C/TT/1149.6
  IEEE Standard for Boundary-Scan Testing of Advanced Digital Networks

10 New Business

10.1 Update to TTSC P&P: Due end od 2022

There is a draft on the iMeet site. Please review! Notion of forming study groups for revision PARs probably needs to be added. Target: Voting on the P&P in the Q1 2022 meeting. Ian McIntosh will provide a link to the iMeet site.

There is a template for WG P&P. Ian McIntosh issued some concerns with respect to the public domain software as referred to the WG P&P template.

After the TTSC P&P are agreed to by AUDCOM, we have to provide a consistent updated WG P&P.

11 Any other business

ITC Session/TTSC Panel

Jeff Rearick reported that it was a non-traditional panel called *Talk to the TTSC*. Most important question (Teresa McLaurin) was concerning the languages for test standards. She suggested having one standard language which is extensible. This would be a live evolving thing, not handled like the other TTSC standards (Stud Group, PAR, WG, Ballot).

The presentation led to a discussion about extension mechanisms of existing languages (CTL/STILE, BSDL, VHDL, Verilog), the use of meta languages and the conflict between established tools using existing standards and having one language for everything with its required complexity and maintenance.

Ian McIntosh took the action of starting a study group which will look into this problem in more detail after this meeting.

As part of the discussion, Jeff showed the following list of notes he has taken at the ITC panel:

On languages

- *There should be one language for all standards. It is not manageable the way it is managed now.*
- *Should be Verilog or VHDL (I took this to mean use existing EDA language)*
- *Suggested to separate out ICL and PDL to make it a separate language. This will help maintaining it and allow new standards to add/revise it as needed. Should be a "live" standard, something that is easily revised.*
- *STIL and CTL were intended for this purpose, we could consider opening this up again. 1450 has many dots, so tried to attempt the "live" standard concept.*
- *BSDL tried to provide an extension mechanism*
- *1687 did look at CTL, but felt it didn't fit.*
- *Also tried to extend STIL for analog, but it was not practicable (though 1450.4 is usable for analog).*
- *Problem with OCI Acellera compression, would other EDA vendors use/be able to use it?*
- *1450.6.1 is inactive reserved.*
- *Need a different operating model for managing a single standard language*

(the complete document is on the iMeet site)

Diagnostic DATA in STDF as a standard. 1450.1 has an Appendix that describes failure data reporting for STIL patterns. Other methods were mentioned, too.

12 Subcommittee reports

None

13 Items reported out of executive sessions

None

14 New Action Items

Get information on 1149.8.1 usage by tool vendors (Ian McIntosh)

Review and draft the SC P&P (Ian Macintosh)

Organize a subcommittee to look at the common language questions (Ian McIntosh)

Clarify the six-month requirement for study groups (Ian McIntosh)

15 Next meeting

The next meeting will take place on January 19th, 2022, same time.

16 Adjourn

MOTION	To adjourn
Mover	Adam Cron
Second	Al Crouch
Votes	No objections were raised.
Decision	Approved

The meeting was adjourned at 1:01 EST.

History of these minutes

- Meeting notes recorded by: Michael Wahl
- Minutes submitted by: Michael Wahl, TTSC Secretary

17 Appendix

17.1 IEEE TTSC Membership

First name	Name	Company	
Saman	Adham	Taiwan Semiconductor Manuf. Corp.	M
Mudasir	Ahmad	Google	O
Deepak	Asnani	Google	O
Anthony	Coyette	ON Semiconductor	O
Adam	Cron	Synopsys, Inc.	M
Alfred	Crouch	Amida Technology Solutions	M
Jason	Doege		O
Ric	Dokken	Roguevation, Inc.	M
Heiko	Ehrenberg	Goepel electronics LLC	M
Rodolfo A.	Fiorini	Poitecnico di Milano	O
Akshay	Gupta	Synopsys	O
Neil	Jacobson	Formidable Engineering Consultants	M
Rolf	Kühnis	Intel Corporation	O
Michael	Laisne	Renesas	M
Adam	Ley	ASSET InterTech, Inc.	M
Erik Jan	Marinissen	imec / TU Eindhoven	M
Greg	Maston	Self emplyed	M
Ian	McIntosh	Leonardo S.p.A.	M
Sankaran	Menon	Intel Corporation	M
Spencer	Millican	Auburn University	O
Ananthashayana	Mosale	Intel Corporation	O
Jim	O'Reilly	Intel Corporation	M
Jason	Peck	Texas Instruments Inc.	M
John	Potter	Anora	O
Rajesh	Raina	NXP Semiconductors	M
Jeff	Rearick	Advanced Micro Devices (AMD)	M
Mike	Ricchetti	Synopsys, Inc.	M
Saghir	Shaikh	Broadcom Corporation	M

Steve	Sunter	Mentor, a Siemens Business	M
Bambang	Suparjo	Intel Corporation	M
Bradford	Van Treuren	VT Enterprises Consulting Services	M
Tom	Waayers	NXP Semiconductors	M
Michael	Wahl	University of Siegen	M

Members   Have attended at least three consecutive meetings and have the right to vote

Observers Have not (yet) attended three consecutive meetings and have no right to vote