IRDIBIS Open Forum Minutes

Meeting Date: **July 14, 2023**
Meeting Location: **Teleconference**

VOTING MEMBERS AND 2023 PARTICIPANTS

Altair	(JuneSang Lee)
AMD (Xilinx)	(Bassam Mansour)
Ansys	Curtis Clark*, Wei-hsing Huang
Applied Simulation Technology	(Fred Balistreri)
Aurora System	Dian Yang, Raj Raghuram
Broadcom	(Yunong Gan)
Cadence Design Systems	Kyle Lake*, Jared James, John Philips, Kristoffer Skytte
Celestica	(Sophia Feng)
Cisco Systems	(Stephen Scearce), Hong Wu
Dassault Systemes	Stefan Paret, BAI Longfei
GE Healthcare Technologies	(Balaji Sankarshanan)
Google	(Hanfeng Wang)
Honeywell	Bavish Vazhayil
Huawei Technologies	Danilo Di Febo, Marco De Stefano, (Hang (Paul) Yan)
Infineon Technologies AG	(Christian Sporrer)
Instituto de Telecomunicações	(Abdelgader Abdalla), Joana Catarina Mendes
Intel Corporation	Chi-te Chen*, Kinger Cai*, Michael Mirmak*, Hsinho Wu*
Keysight Technologies	Ming Yan, Douglas Burns, Fangyi Rao, Pegah Alavi, Hee-Soo Lee, Heidi Barnes
Marvell	Steven Parker*
MathWorks	Graham Kus*, Walter Katz, Kerry Schotz
Micron Technology	[Randy Wolff], Justin Butterfield, Akshay Shivaji Chaudhari, Dragos Dimitriu
MST EMC Lab	Chulsoon Hwang*, Zhiping Yang*
SerDesDesign.com	John Baprawski
Siemens EDA	Arpad Muranyi, Weston Beal*, Matthew Leslie, Mikael Stahlberg, Todd Westerhoff, Scott Wedge, Randy Wolff*
STMicroelectronics	Olivier Bayet, Rahul Kumar, Raushan Kumar, Manish-FTM Bansal, Sameer Vashishtha
Synopsys	Ted Mido*, (Tushar Pandey), Wael Dghais
Teraspeed Labs	Bob Ross*
Waymo	[Zhiping Yang], (Ji Zhang)
ZTE Corporation	(Shunlin Zhu)
Zuken	[Michael Schäder], Markus Bücker, Ralf Brüning
Zuken USA	Lance Wang*

OTHER PARTICIPANTS IN 2023

Alphawave Semi	Adrien Auge, Todd Bermensolo
Ciena	Hugues Tournier
Hitachi Ltd.	Yutaka Uematsu
Honeywell	Bavish Vazhayil
India Institute of Technology	Jai Narayan Tripathi, Vinod Verma
Nokia	Ramiro Guzman
OMNIVISION	Sirius Tsang
Signal Edge Solutions	Ben Dannan
SI Guys	Donald Telian
Socionext, Inc.	Raymond Yakura
University of Illinois Urbana-Champaign	Jose Schutt-Aine
University of Tunisia, Electronic Laboratory	Malek Souilem
Unaffiliated	Will Hobbs, Mike LaBonte, Jon Powell, Stephen Peters

In the list above, attendees present at the meeting are indicated by "*." Those submitting an email ballot for their member organization for a scheduled vote are indicated by "^." Principal members or other active members who have not attended are in parentheses "( )." Participants who no longer are in the organization are in square brackets "[ ]."

UPCOMING MEETINGS
The connection information for future IBIS teleconferences is as follows:

Microsoft Teams meeting
Join on your computer or mobile app
Click here to join the meeting

Join with a video conferencing device
106010980@teams.bjn.vc
Video Conference ID: 114 666 897 5
Alternate VTC dialing instructions

Or call in (audio only)
+1 267-768-8015,554664847#   United States, Philadelphia
Phone Conference ID: 554 664 847#
Find a local number | Reset PIN
Learn More | Meeting options

All teleconference meetings are 8:00 a.m. to 9:55 a.m. US Pacific Time. Meeting agendas are typically distributed seven days before each Open Forum. Minutes are typically distributed within seven days of the corresponding meeting.

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM
Lance Wang opened the meeting. Graham Kus reported 11 attendees and that quorum was reached.

CALL FOR PATENTS

Lance Wang called for declaration of any patents or pending patents related to the IBIS, IBIS-ISS, ICM, or Touchstone 2.0 specifications. Patents were not declared and there was no comment raised regarding specifications.

REVIEW OF MINUTES AND ARS

Lance Wang called for review of minutes, as follows:
May 10, 2023: Curtis Clark motioned to accept, Michael Mirmak seconded. The motion passed.
May 12, 2023: Michael Mirmak motioned to accept, Curtis Clark seconded. The motion passed.
June 2, 2023: Curtis Clark motioned to accept, Randy Wolff seconded. The motion passed.
June 23, 2023: Bob Ross motioned to accept, Curtis Clark seconded. The motion passed.

ANNOUNCEMENTS, **CALL FOR ADDITIONAL AGENDA ITEMS**

Lance Wang called for any announcements.

MEMBERSHIP STATUS AND TREASURER'S REPORT

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Bob Ross reported that for July 14, 2023, we have 29 voting members and a quorum of 8.

We temporarily restored Cadence Design Systems because there may have been system related payment issues.

We believe this has been resolved, and payment is expected soon.

Currently we have 27 renewals and 2 new members (for a total of 29) for 2023.

The European IBIS Summit sponsorship payment that is recorded as the last line, as the only change from the last report.

$16,345 Balance for 2023

$21,395 Adjusted Balance for 2023 (Note, 2020 ZTE sponsorship moved forward to 2023)

Lance asked if there were questions. None were asked.

WEBSITE ADMINISTRATION

Steven Parker reported in terms of website updates, there had been delays due to being out of office, but have in the previous week worked to update most recent sets of minutes.

MAILING LIST

Curtis Clark reported that a few members of IEEE had started bouncing from the reflector. Also there had been some subscribers that recently reported issues with the reflector, not receiving emails but colleges had been- and has worked to update those organizations and it appears to be an IT or spam issue on the member email box system and is working to support those fixes.

LIBRARY UPDATE

Zhiping Yang reported no updates.

UNIVERSITY RELATIONS

Professor Chulsoon Hwang reported that, the IEEE SIPI summit, had been in contact with other professors about making presentations and updates are to follow.

INTERNATIONAL/EXTERNAL ACTIVITIES

Conferences:

Lance Wang reported no updates.

Press Updates

No updates were reported.

Related Standards

Michael Mirmak reported there are ongoing discussions about having an IBIS liaison to DASC. Michael stated his name has been submitted in for consideration, and other members of DASC seem to be interested. The question being, is whether IBIS Open Forum wants a liaison to IEEE DASC. Lance Wang recognized a motion. Bob Ross motioned to make Michael the liaison. Curtis Clark seconded. The motion passed. There were no objections [AR].

Michael proposed that in addition to a note about this new role, also that Chair of University Relations also be brought to about IBIS on the website for the most recent update [AR].

Michael stated the DASC is where the IEEE gathers and manages design automation, language and modeling related standards under its preview. Such as Verilog, VHDL, those are managed thru DASC. There are other standards thru Accellera- which is a private organization that is essentially a feeder for topics by DASC, such as 2401 which is our LPB which is by DASC monitored. In essence this is where the action is for standards related to the same community that IBIS is, the role here is simply because they hear more about it, IEEE SIPI summit, interest is being generated, there is a common audience what DASC addresses and IBIS addresses- want more formal reports and what the organizations do, to improve the information flow.

One thing to note is 2401-2019, release, the specifications have to go through the standards committees every 5 years, the JEITA is already making revisions to 2401. We fully expect IBIS and Touchstone to be topics at the Japan IBIS Summit.

Graham Kus asked if we should have a side bar or home page link to the DASC IEEE Liaison along with summary.

Bob Ross suggested it might be a side bar for any liaisons- such as DASC and University Liaisons.

The discussion concluded. Lance thanked the members for their comments.

IEEE IBIS Standardization

Lance Wang reported no action on this topic.

IBIS Summits:

IEEE EMC+SIPI conference, with IBIS Summit held Friday August 4, 2023:

Lance Wang stated this would be a hybrid meeting with an online invite link sent to registered by email request. Lance stated he believed Weston Beal and Chulsoon Hwang would be attending in person. Randy Wolff stated there were very few registrations thus far. Randy asked for members to attend remotely to request registration to receive a link.

Michael Mirmak explained the website.

Bob Ross stated we have 4 presentations currently scheduled. Lance Wang added that Zhiping would be adding another technical presentation. This would bring the sum to 5 presentations. Bob suggested the room being available all day would motivate having more presentations

Randy asked if Zhiping knew about refreshments and other related logistics. Zhiping would double check the issues and update via email. Asked for classroom setting, but most meetings are board room setting. Zhiping asked how many on site. Randy stated there may be Weston suggested there would be 3 so far. Zhiping suggested can spread the word to have more people send online. Randy asked to double check that it would support online. Zhiping said there would be a Webex meeting update.

Shanghai IBIS Summit November 10, 2023:

It was noted that the China IBIS Summit is planned for Nov 10, 2023. It would be on-site/in-person, late afternoon California, and evening Eastern.

The representatives for the facilities hosting the China IBIS Summit are thinking the hotel internet is not provisioned sufficiently to support a Teams or WebEx remote attendance broadcast. Lance Wang reported that everyone in China seems to be excited that it would be on site. So the decision is to move forward with the China IBIS Summit this year, and see how that goes.

Lance asked if there was a motion to support $7,000 USD spending on the Asian IBIS Summit in Shanghai. Bob Ross motioned to support spending this amount, and Zhiping Yang seconded. There were no objections. The motion to approve spending passed.

Bob stated that as for sponsorship, the EDA sponsors will be permitted to do a vendor pitch in the afternoon during the IBIS Summit. Lance stated his plan is to share a bit more next IBIS Open Forum meeting to share on sponsorship details.

Japan IBIS Summit (organized by JEITA), November 14, 2023:

Michael Mirmak reports that JEITA desires a pre-recorded set of presentations, such that translation can be accommodated beforehand. Randy Wolff added it helps with subtitles as well as part of the translation. Lance Wang stated he will attend due to a local business trip adjacent to the Summit occurrence. Only morning Japan time, evening our time- half day meeting. The Japan IBIS Summit will be planned to be hybrid meeting. Lance stated the date of the Japan IBIS Summit is currently scheduled for November 14, 2023. Lance asked if there were any questions, none were asked.

QUALITY TASK GROUP

Bob Ross reported there are no new bug reports, and there would be discussion at the end with Weston Beal providing an update on the IBIS Quality specification, mostly a formatting update.

Note: The Quality task group checklist and other documentation can be found at:

http://www.IBIS.org/quality_wip/

ADVANCED TECHNOLOGY MODELING TASK GROUP

Randy Wolff reported on behalf of Arpad Muranyi that the group is reviewing Kinger Cai's draft PSIJ BIRD and discussing feedback on that. There has been email discussion with the SPI IBIS Summit presentation authors from India on the PSIJ topic. Kinger's BIRD is getting closer to completion. Those are the main topics of discussion in ATM.

Lance thanked and asked for questions, none were asked.

Note: Task group material can be found at:

http://www.IBIS.org/macromodel_wip/

INTERCONNECT TASK GROUP

Michael Mirmak reported to meet weekly Wednesdays at 8am US Pacific time, at present have finished up on the major change proposals and other items related to Touchstone 2, and later on in this meeting some of those details. Now turning to Touchstone 3 as a topic, there was a kick-off of technical discussions on topics of pole residue format and on file compression. It is anticipated that the next few weeks meetings will cover those details.

Graham Kus asked if MathWorks, had been participating in the Interconnect Task Group discussions regarding Touchstone and Michael stated not since the most recent topics.

Note: Task group material can be found at:

http://www.IBIS.org/interconnect_wip/

EDITORIAL TASK GROUP

Michael Mirmak reported remains suspended as there are no updates.

Lance asked if there were questions. None were asked.

Note: Task group material can be found at:

   http://www.IBIS.org/editorial_wip/

NEW ADMINISTRATIVE ISSUES

Roll call: Graham Kus reported a mid-meeting count of 14 attendees.

NEW AND REVISED *IRDS

TSIRD5.1:

Lance Wang asked Michael Mirmak for an update on TSIRD5.1. Michael stated this is a change to the Touchstone Specification. The idea is to, if you read both Touchstone 1.0 and 2.0 format examples, both include an OPTION line. The idea was the original Touchstone format originated circa mid-1980's and would have the impedance noted. Most of the configuration would be described in that line- units, s-params, z-params, and a reference value. For S-Parameter files, this is usually R and then the impedance value 50 or 42.5. The Touchstone 2 format expands this to allow multiple reference sets. It took some time for Touchstone 2 to be adopted by the industry at-large, and proprietary versions would still be found, especially based on Touchstone 1, where the OPTION call was extended in a proprietary manner to support that variability. The TSIRD5.1 makes modifications to enable an effective Touchstone 1.1 that enables multiple per-port referencing on the OPTION line, to bring the Touchstone 1.x formatting to match with the proprietary use employed today. Touchstone 2 is also being updated to 2.1 to have additional keywords that would also accept multiple references. The TSIRD5.1 document is fairly long, 13 pages, lots of references to this OPTION line and the concept. Michael asked if there were any questions. None were asked.

TSIRD6:

Bob Ross reported we restored a legacy paragraph that is in TSIRD5.1 as an introduction. We made a statement that for only Touchstone 2.0, the specification suggests a file extension .ts. The 3rd paragraph permitted this for Touchtone 1.0 or 1.1. So these 3 items were replaced with 2 paragraphs and the goal for TSIRD6 is to state a suggestion or recommendation that .ts be used as a file extension, but it is not required. In fact, the specification does not require any file extension, but there are reasons we permit it, such as to facilitate or support translation software from Touchstone 1.0 to Touchstone 2.0. In translating we over-write with the original parser, so having an extension helps with the over-writing avoidance. The parser already supports this change for all Touchstone files. For all Touchstone files we suggest a .ts file extension. That is the summary of TSIRD6.

Randy Wolff suggested there would be further discussion later about future versions of Touchstone file formats.

Lance Wang asked if there was a motion to schedule these TSIRD for schedule to vote. Michael Mirmak proposed they be reviewed first. There was not a motion.

Lance asked any questions, none were asked.

IRDS SCHEDULED FOR VOTE

BIRD223:

Lance Wang asked Graham Kus to confirm quorum. Quorum was confirmed.

Kinger Cai thanked Zhiping Yang and others for great topical and editorial feedback during the review process. Kinger shared that Arpad Muranyi provided valuable feedback especially with regards to precision and syntax and compliance to IBIS. He also thanked Walter Katz for beneficial feedback thru email and meetings. Also expressed thanks to Michael Mirmak, Lance Wang, Randy Wolff, Curtis Clark, and others who he could not name due to time constraints but is thankful for all of the contributions to this BIRD.

Kinger expressed that today IBIS has been brought from private domain to public domain, and with power topics, with SPIM port list, Touchstone file, stimulus, network, etc. Each is a good example of how concepts can be described with its well defined tree structure. Last but not least, Intel representatives will further provide a SPIM cookbook with SPIM model practical design examples to apply and leverage by users.

Kinger noted that 3 EDA Vendors support SPIM, and to make SPIM part of IBIS specification will support vendors efforts, and also support innovation in design.

Kinger again expressed thanks to the group and all contributors for their feedback.

Randy Wolff stated that Arpad had hoped to attend today, and had provided a lot of feedback on BIRD223 and had been trying to finish review of the BIRD, and had asked for a delay on the vote for 1 more meeting to get that feedback.

Lance asked for any comments.

Kyle Lake suggested there had a lot of internal and group review to this point. There is a lot of concern on power integrity in the industry, it gets combined into IBIS discussions.   It is good to learn there is a cookbook planned to provide rough or draft example models.

Kinger stated if the Open Forum committee wants delay, or delay vote- it would have impact on deliverables, such as delaying the provision of a cookbook and otherwise would delay commitments of resources to supporting tasks.

A vote was held to approve BIRD223. The results of the ballot were as follows:

9 votes for Yes, 0 votes for No, and 2 votes for Abstain as follows:

Ansys: Yes

Aurora System: Yes (via email 2023-07-06)

Cadence Design Systems: Yes

Intel Corporation: Yes

Keysight Technologies: Yes

Marvell: Yes

The MathWorks, Inc.: Yes

MST EMC Lab: Yes

Siemens EDA: Abstain

Synopsys: Yes

Zuken: Abstain

The Chair, Lance Wang noted that BIRD223 was approved. [AR]

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BIRD225:
Randy Wolff introduced this BIRD stating it is a follow up from IBISCHK BUG224 that was recently discussed. It relates to checking of EMD files where if you have a EMD file that references another IBIS file there are bus label rules. EMD is enforcing bus label rules by any IBIS file. The behavior of IBISCHK parser is to check the 2 different specific errors associated with pin mapping and bus labels based on IBIS version 7 rules. For example, even if the IBIS file is not version 7, it will check against those rules. If it finds those errors, it will report them and say it is being checked against the IBIS 7 rules, and inform the user they need to fix these. It is not required for IBIS file to be version 7 to be referenced by EMD. We realized that we need to modify the EMD section in IBIS to the mention the bus label rules that need to be followed.
The proposed change is to modify a bus label statement. For the bus label rules in IBIS version 7, the addition is to add a statement within EMD files, as well as any IBIS component, and IBIS file reference by EMD needs to comply with this rule about pins with bus labels have the same signal name. By adding this statement we can be enforce this rule in the IBISCHK parser based on the IBIS specification rule. We did not really have this support before this point, and this is adding that statement.

IRDS ELIGIBLE FOR VOTE

TABLED IRDS: (NO DISCUSSION WITHOUT MOTION TO "UNTABLE")

BIRD220: Pre-driver PSIJ Sensitivity Keyword (Ding et al)

Link:

https://IBIS.org/birds/bird220.docx

Lance reported this would remain tabled. He asked if there were any questions. There were none.

IBISCHK AND TSCHK PARSER AND BUG STATUS

IBISCHK Parser:

BUG243: Bob Ross reported no update.

TSCHK Parser:

No update was reported.

NEW TECHNICAL ISSUES

Motion Regarding Touchstone 2.1: Michael Mirmak stated in regard to Touchstone 2.1, the motion is to close out the content of the TSIRDs so that when approved they can be added into Touchstone and Touchstone 2.1, have been approved but never integrated. This motion is to in essentially only to include these 4 changes into Touchstone 2.1.

Weston Beal discussed a new IBIS Quality Specification and provided a link for reference.

Link: https://www.IBIS.org/quality_ver3.0_wip/

Weston summarized the presentation and stated this is the document for actually updating the IBIS Quality Specification. The issue is that with IBIS Quality Specification IQ 4, the title is changed to Power Analysis. There have been added a few more paragraphs or points regarding pin mapping and other requirements. Weston shared having received feedback from Michael Schäder after a presentation, and also from Arpad Muranyi about package quality. These updates have been made and integrated. Especially section 3.4 is new or updated-around packaging, packing model, etc. Weston asked for the group to review this updated version.

Arpad brought up the question of EMD files. Weston stated there were no plans to address EMD files at this time. He agreed it can be complicated, but not sure how to fit in the IBIS Quality Specification at this time. He suggested maybe it would fit in Quality Level 4 specification relating to Power Topics, or perhaps a separate presentation in a number of IBIS Summits, and what the pitfalls are of EMD files. Weston suggested they discuss it next week

and we could work to how to fit in EMD as a discussion, or at least an Appendix as a comment to their quality. Arpad and Lance Wang agreed.

Lance recommended the group take time to review the document and encouraged feedback be provided to Weston to help move this along. Lance asked if there were further questions. There were none asked.

NEXT MEETING

Lance Wang stated the next meeting would be July 14, 2023, and due to August 4, 2023 being IEEE-SIPI IBIS Summit, following Open Forum meeting would be August 25, 2023. The following Open Forum meeting would be held September 15, 2023.

Curtis Clark motioned to adjourn the meeting. Kyle Lake seconded. The meeting was adjourned.

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NOTES

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This meeting was conducted in accordance with SAE ITC guidelines.

All inquiries may be sent to info@ibis.org. Examples of inquiries are:

- To obtain general information about IBIS.
- To ask specific questions for individual response.
- To subscribe to or unsubscribe from the official IBIS@freelists.org and/or IBIS-users@freelists.org email lists (formerly IBIS@eda.org and IBIS-users@eda.org):
    - https://www.freelists.org/list/IBIS
    - https://www.freelists.org/list/IBIS-users
- To subscribe to or unsubscribe from one of the task group email lists: IBIS-macro@freelists.org, IBIS-interconn@freelists.org, IBIS-editorial@freelists.org, or IBIS-quality@freelists.org:
    - https://www.freelists.org/list/IBIS-macro
    - https://www.freelists.org/list/IBIS-interconn
    - https://www.freelists.org/list/IBIS-editorial
    - https://www.freelists.org/list/IBIS-quality
- To inquire about joining the IBIS Open Forum as a voting Member.
- To purchase a license for the IBIS parser source code.
- To report bugs or request enhancements to the free software tools: IBISchk7, tschk2, icmchk1, s2IBIS, s2IBIS2 and s2iplt.

The BUG Report Form for IBISchk resides along with reported BUGs at:

http://www.IBIS.org/bugs/IBISchk/
http://www.IBIS.org/ bugs/IBISchk/bugform.txt

The BUG Report Form for tschk2 resides along with reported BUGs at:

http://www.IBIS.org/bugs/tschk/
http://www.IBIS.org/bugs/tschk/bugform.txt

The BUG Report Form for icmchk resides along with reported BUGs at:

http://www.IBIS.org/bugs/icmchk/
http://www.IBIS.org/bugs/icmchk/icm_bugform.txt

To report s2IBIS, s2IBIS2 and s2iplt bugs, use the Bug Report Forms which reside at:

http://www.IBIS.org/bugs/s2IBIS/bugs2i.txt
http://www.IBIS.org/bugs/s2IBIS2/bugs2i2.txt
http://www.IBIS.org/bugs/s2iplt/bugsplt.txt

Information on IBIS technical contents, IBIS participants and actual IBIS models are available on the IBIS Home page:

http://www.IBIS.org/

Check the IBIS file directory on IBIS.org for more information on previous discussions and results:

http://www.IBIS.org/directory.html

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SAE STANDARDS BALLOT VOTING STATUS (attendee X; absent -)

Organization	Interest Category	Standards Ballot Voting Status	May 12, 2023	June 2, 2023	June 23, 2023	July 14, 2023
Altair	User	Inactive	-	-	-	-
AMD (Xilinx)	Producer	Inactive	-	-	-	-
Ansys	User	Active	X	X	X	X
Applied Simulation Technology	User	Inactive	-	-	-	-
Aurora System	User	Inactive	-	-	-	-
Broadcom Ltd.	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	X	X	X	X
Celestica	User	Inactive	-	-	-	-
Cisco Systems	User	Inactive	-	-	-	-
Dassault Systemes	User	Inactive	-	-	-	-
GE Healthcare Technologies	User	Active	-	-	-	-
Google	User	Inactive	-	-	-	-
Honeywell	User	Active	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Instituto de Telecomunicações	User	Inactive	-	-	-	-
Intel Corp.	Producer	Active	X	X	X	X
Keysight Technologies	User	Inactive	-	-	X	-
Marvell	Producer	Active	-	X	X	X
MathWorks	User	Active	X	X	X	X
Micron Technology	Producer	Active	-	X	-	-
MST EMC Lab	User	Inactive	X	X	X	X
SerDesDesign.com	User	Inactive	-	-	-	-
Siemens EDA	User	Active	X	X	X	X
STMicroelectronics	Producer	Inactive	-	-	-	-
Synopsys	User	Active	X	X	X	X
Teraspeed Labs	General Interest	Active	X	X	X	X
Waymo	User	Active	-	-	-	-
ZTE Corp.	User	Inactive	-	-	-	-
Zuken	User	Active	X	X	X	X

 = Temporarily not a voting member

Criteria for SAE member in good standing:
- Must attend two consecutive meetings to establish voting membership.
- Membership dues current
- Must not miss two consecutive meetings (voting by email counts as attendance)

Interest categories associated with SAE standards ballot voting are:
- Users - members that utilize electronic equipment to provide services to an end user.
- Producers - members that supply electronic equipment.
- General Interest - members are neither producers nor users. This category includes, but is not limited to, government, regulatory agencies (state and federal), researchers, other organizations, and associations, and/or consumers.