IBIS Open Forum Minutes

Meeting Date: April 26, 2013
Meeting Location: Teleconference

VOTING MEMBERS AND 2013 PARTICIPANTS

Agilent	Radek Biernacki*, Pegah Alavi, Heidi Barnes, Fangyi Rao, Colin Warwick, Tarun Kalwani*
Altera	David Banas*, Hsinho Wu
ANSYS	Luis Armenta
Applied Simulation Technology	Fred Balistreri, Norio Matsui
ARM	(Vipul Patel)
Cadence Design Systems	Terry Jernberg, Joy Li, Yingxin Sun, Ambrish Varma*, Kevin Yao, Brad Brim
Ericsson	Anders Ekholm, Martina Fiammengo
Foxconn Technology Group	(Sogo Hsu)
Freescale	Jon Burnett
Huawei Technologies	(Jinjun Li)
IBM	Greg Edlund, Adge Hawes*
Infineon Technologies AG	(Christian Sporrer)
Intel Corporation	Michael Mirmak*, Mohammad Bapi, Stewart Gilbert, Ravindra Rudraraju
IO Methodology	Lance Wang
LSI	Brian Burdick, Sarika Jain
Maxim Integrated Products	Hassan Rafat, Mahbubul Bari, Ron Olisar
Mentor Graphics	Arpad Muranyi*, Ed Bartlett, Vladimir Dmitriev-Zdorov
Micron Technology	Randy Wolff*
Nokia Siemens Networks GmbH	(Eckhard Lenski)
QLogic	James Zhou
Signal Integrity Software	Walter Katz*, Mike LaBonte*, Mike Steinberger, Todd Westerhoff
Synopsys	John Ellis, Ted Mido, Scott Wedge, Rinsha Reghunath
Teraspeed Consulting Group	Bob Ross*, Tom Dagostino
Texas Instruments	(Pavani Jella)
Toshiba	(Yasumasa Kondo)
Xilinx	(Raymond Anderson)
ZTE	(Huang Min)
Zuken	Masaud Raeisi, Reinhard Remmert

OTHER PARTICIPANTS IN 2013

Bayside Design	Elliot Nahas
ECL Advantage	Thomas Iddings
Granite River Labs	Vamshi Kandalla, Miki Takahashi
Hewlett-Packard	Yongjin Choi, Ting Zhu

KEI Systems	Shinichi Maeda
National Instruments	Lee Mohrmann
Nvidia	Eric Hsu
Qualcomm	Scott Powers
TechAmerica	(Chris Denham)
Teradyne	Raymond Yakura
University of Illinois	Tom Comberiate, José Schutt-Ainé
Vitesse Semiconductor	Sirius Tsang

In the list above, attendees at the meeting 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 bridge numbers for future IBIS teleconferences are as follows:

Date	Meeting Number	Meeting Password
May 15, 2013	IBIS Summit at SPI, Paris – no teleconference	
May 17, 2013	205 475 958	IBIS

For teleconference dial-in information, use the password at the following website:

https://ciscosales.webex.com/ciscosales/j.php?J=205475958

All teleconference meetings are 8:00 AM to 9:55 AM 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. When calling into the meeting, follow the prompts to enter the meeting ID. For new, local international dial-in numbers, please reference the bridge numbers provided by Cisco Systems at the following link:

http://www.cisco.com/web/about/doing_business/conferencing/index.html

NOTE: "AR" = Action Required.

INTRODUCTIONS AND MEETING QUORUM
Michael Mirmak declared that a quorum was reached and the meeting could begin.

Tarun Kalwani introduced himself. He is an intern working at Agilent Technologies, on IBIS-AMI and PCB analysis.

CALL FOR PATENTS
Michael Mirmak called for any patents or pending patents related to the IBIS 3.2, IBIS 4.2, IBIS

5.1, Touchstone 2.0 or ICM 1.1 specifications. No patents were declared.

REVIEW OF MINUTES AND ARS
Michael Mirmak called for comments regarding the minutes of the April 5, 2013 IBIS Open
Forum teleconference. The minutes were approved without changes.

MEMBERSHIP STATUS AND TREASURER'S REPORT
No update.

WEB PAGE UPDATES
Mike LaBonte reported that there have not been any web updates.

Mike also reported on efforts to create a "hit counter" for the IBIS pages, which is under
discussion with the EDA.org system administrators. The Webalyzer tool is running all the time
on EDA.org, generating charts and "top 10" reports as well as country information on usage.
The reports do not indicate how often each individual page is hit or when last hit. Mike looked
into inserting PHP code into some pages to record every visit, but EDA.org informs us that PHP
code file access is not allowed by the site security policy. Mike has looked into free hit counter
services, but these usually introduce advertising. Mike showed the report page at
www.eda.org/ibis/usage; the distinction between hits and pages not clear. Reports show that
board members are logging into the site most often. Other groups on EDA.org appear to just be
using PHP applications. The IBIS homepage had 1744 hits in the month of March and is the
most used IBIS page. Other pages reflect large amounts of data transfer, but this may be a
side-effect of file sizes (e.g., Summit presentations).

Mike still has an open AR to develop and post terms of use for the IBIS pages.

MAILING LIST ADMINISTRATION
Mike LaBonte reported that usual activity continues.

MODEL LIBRARY UPDATE
No update.

MISCELLANY/ANNOUNCEMENTS
None.

CALL FOR NEW ISSUES
Bob Ross asked for addition of BUG145 to the agenda and a Model Review committee
discussion.

MODEL REVIEW

Mike LaBonte noted that a web page has been made available for the Model Review committee and that Bob Ross had volunteered to become the coordinator. Bob noted that the review service is intended today just for IBIS-AMI models only, not for traditional models.

The system will work via e-mail, with submissions going to Bob, and Bob redistributing the models to EDA vendors who volunteer to participate. Even Bob will not see the review comments being passed back. EDA vendors would receive the files from Bob, but communication is one-way.

Ambrish Varma asked if the review covered DLLs, AMI parameter files or others. He assumed everything. Mike noted that IBISCHK analysis would be an integral part, particularly as so many files from previous Model Review work did not pass.

Radek Biernacki wondered if the model review service description should use "functionality" vs. "performance". Ambrish asked if it passes IBISCHK, is it compliant. Michael Mirmak mentioned "0.ibs" from Bob. Bob noted that he is assuming that EDA vendors have access to the latest tools.

Bob suggested pulling bullets out and reducing text, converting to contact-style language. Arpad asked why there were no click-on links for reviewers. Having a "Mail Bob" link was discussed. Ambrish asked if there should be a direct link from the left-hand menu. Mike asked if "AMI Model Review" is sufficient. There is a space between it and "Free Tools". Ambrish pointed out where "Support" was. Are there no reviews received? Michael stated no. Bob confirmed that Lynne Green had not received review requests more than 1-2 times over 3-4 years. Ambrish suggested cross-linking to Support. Michael suggested cross-linking to Model Library pages as well. Arpad suggested that clarity under "Support" be ensured, to differentiate between Model Review and AMI Model Review. Mike took the AR to take care of language and update the links.

IBIS AFFILIATIONS

Michael Mirmak noted that he is deferring this topic until the next meeting.

INTERNATIONAL/EXTERNAL ACTIVITIES

- Conferences

The 17th IEEE Workshop on Signal and Power Integrity (SPI 2013) will be held May 12-15, 2013 in Paris, France. There will be a European IBIS Summit in conjunction with this conference. Anders Ekholm is the keynote speaker. More information is available at:

http://spi2013.org

The 22nd IEEE Workshop on Electrical Performance of Electronic Packaging and Systems (EPEPS 2013) will be held October 27-30, 2013 in San Jose, California. There may be content related to IBIS modeling. More information is available at:

http://epeps.ece.illinois.edu/

- Press Update
Bob Ross reported on a paper on model extraction mentioning IBIS. The paper is "Novel Extraction of a Table-Based I-Q Behavior Model for High-Speed Digital Buffers/Drivers", by H.M. Teixeira, T.R. Cunha and J.C. Pedro of the Instituto de Telecommunicações in Aveiro, Portugal, published in the March 2013 IEEE Trans. on Components, Packaging and Manufacturing Technology, pp. 500-507.

Michael Mirmak suggested that a reference library page be added to the website. Mike LaBonte agreed. A discussion regarding adding such a page will be added to the agenda for next time.

SUMMIT PLANNING
- SPI 2013 will be held in Paris on May 12-15, 2013. The IBIS Summit meeting is planned for Wednesday afternoon, May 15, at the Hotel Concorde La Fayette. Announcements have been distributed, including to the SPI participants. Bob Ross noted five papers are scheduled so far. Zuken and Micron Technology are co-sponsors so far.

Sponsorship opportunities for all upcoming IBIS summits are available, with sponsors receiving free mentions in the minutes, agenda, and other announcements. Contact the IBIS Board for further details.

Arpad Muranyi asked about DesignCon 2014, noting that the conference schedule now spans Tuesday-Friday. As a result, would the IBIS meeting day change? Bob Ross and Michael Mirmak confirmed that IBIS would likely meet in a Friday summit, though Monday becomes a possibility. In the past, Sunday travel has been the problem for attendees. Bob noted that the Summit is scheduled to avoid overlapping DesignCon events due to substantial participation by active IBIS members. This discussion will continue in future meetings.

QUALITY TASK GROUP
Mike LaBonte noted that the Quality Task Group is changing its approach. Its immediate work will no longer focus on cleaning up parser messages; instead, the team will clean up the source spreadsheet from the parser developer first and integrate the results into the parser specification.   Bob Ross and Mike LaBonte have jointly prepared presentations on this and other topics which will be presented by Anders Ekholm at the European IBIS Summit. The group has been trying to meet on a weekly basis, but Mike has not been available. The next meeting will be May 7, with weekly meetings after that.

The Quality Task Group checklist and other documentation can be found at:

   http://www.eda.org/ibis/quality_wip/

ADVANCED TECHNOLOGY MODELING TASK GROUP
Arpad Muranyi reported that the group is meeting regularly on Tuesdays at 12:00PM PT. The team just finished a long discussion on BIRD160, with BIRD 160.1 just having been posted. Future meetings will continue to focus on repeater/redriver BIRDs plus other AMI BIRDs, including backchannel and dependency tables.

Task group material can be found at:

INTERCONNECT TASK GROUP
Michael Mirmak reported that the group continues to discuss drafts of the EMD proposal. Additional review and comments are welcome.

The task group documents can be found at:

CLOSE BIRDS FOR IBIS 6.0 BY JUNE 7
Michael Mirmak reviewed plans for a six-month update schedule for IBIS, suggesting that IBIS 6.0 be the next version, with the June 7 IBIS Open Forum teleconference becoming the cutoff for BIRDs to be approved for that version. BIRDs would have to be submitted by May 24 for vote consideration, per IBIS policy. Maintaining a six-month schedule would put the next cutoff date in December. Michael noted that the advantage of 6.0 for a version is to raise new parser funds. He called for discussion and motions.

Arpad Muranyi noted that if you want to make a general decision for future release cutoff dates as the first meeting of June or first meeting of December, this would setup a schedule that would apply to any year, as opposed to a specific date. Michael responded that we will set a specific date this time only.

Ambrish Varma asked if we know what decides a major or minor release. Do we have a major cycle followed by a minor cycle? Michael noted that significant parser changes from implementing new keywords and subparameters forces significant parser development and requires a major release. If we closed every BIRD on the list out by June 7, there would be major changes that would require significant parser development. Bob Ross added that an IBIS version 6.x would repair BIRDs in IBIS version 6.0. IBIS 5.1 was a clarification to IBIS 5.0, where 5.0 was an opportunity to use the specification and find problems.

Ambrish asked what we do if we have many new BIRDs between June and December. Is it possible to have a 6.0 in June and 7.0 in December? Arpad responded that we can work on two releases a year and have a separate discussion on what that release is called, for instance 6.1 or 7.0. Bob added that the decision is more dependent on funding realities versus policy. Michael added that assume we could have a parser right after release. Is 6 months too short a time period for the industry to absorb the changes? We might be in a unique cycle now with many more major changes coming in the next 6 months. We might assume a more regular cycle of major, minor, major, minor at a later time. Arpad added that many times features are already implemented in the tools and just need to be tweaked to meet the IBIS specification. Sometimes features require more major changes. Bob asked if it is ok to release an update but not get a parser for a long period of time and still continue with specification development. Michael clarified for Ambrish that we don't raise funds until we need to develop a new parser,

and development doesn't start until we raise sufficient funds.

Bob moved that we target June 7 for a closure date to vote on all BIRDs that will be included in IBIS 6.0. The BIRDs must be posted for review by May 24. Arpad seconded the motion.

The motion passed with the following vote tally:

Agilent – abstain
Altera – yes
Cadence – yes
IBM – yes
Intel – yes
Mentor – yes
Micron – yes
SiSoft – yes
Teraspeed – yes

NEW ADMINISTRATIVE ISSUES
Michael Mirmak reported that DASC had no meeting in the last three weeks, but they did have an approval vote to develop a PAR to start a study group. The group will be looking at feasibility of developing a language combining System-C and AMS.

BIRD116.2: ADD IBIS-ISS TO [EXTERNAL MODEL] AND [EXTERNAL CIRCUIT] AS A SUPPORTED LANGUAGE
Arpad Muranyi moved to vote to reject BIRDs 116.2, 117.5, 118.4 and 129.1. Bob Ross seconded the motion. There were no objections.

Ambrish Varma moved to vote by acclimation. Radek Biernacki seconded the motion. There were no objections.

The vote passed by acclimation.

BIRD117.5: PARAMETERIZE A_TO_D AND D_TO_A CONVERTERS
The BIRD was rejected by the previous vote.

BIRD118.4: ANALOG PARAMETER ASSIGNMENTS
The BIRD was rejected by the previous vote.

BIRD129.1: ADD "POLARITY" ARGUMENT TO D_TO_A CONVERTERS
The BIRD was rejected by the previous vote.

BIRD122: IBIS-AMI NEW RESERVED PARAMETERS FOR ANALOG MODELING

Arpad Muranyi noted that the ATM group would like this BIRD rejected because it is superseded by BIRD158.

Bob Ross moved to vote to reject the BIRD by acclimation. Radek Biernacki seconded the motion. There were no objections.

BIRD144.3: ADD TOUCHSTONE TO [EXTERNAL MODEL] AND [EXTERNAL CIRCUIT] AS A SUPPORTED LANGUAGE

Bob Ross noted that linkages for Touchstone files are being defined through IBIS-ISS inclusion in IBIS with BIRD160. Arpad Muranyi noted that this BIRD would be a shortcut to BIRD160's approach, but two different connection methods are not needed. Bob noted he supported rejecting this BIRD at this point in time.

Bob Ross moved to vote to reject the BIRD by acclimation. Arpad Muranyi seconded the motion. There were no objections.

BIRD159: RX_RECEIVER_SENSITIVITY CLARIFICATION

Arpad Muranyi noted that this BIRD was discussed by the ATM task group, and it was revealed that Arpad's interpretation of the specification was incorrect, and this BIRD was not necessary.

Arpad Muranyi moved to vote to reject the BIRD by acclimation. Bob Ross seconded the motion. There were no objections.

BIRD160.1: ANALOG BUFFER MODELING IMPROVEMENTS

Arpad Muranyi noted that BIRD160 is a combination of BIRDs 116.2, 117.5, 118.4 and 129.1. The BIRD adds IBIS-ISS capabilities to [External Circuit] and [External Model]. This also adds the ability to pass parameters into the IBIS-ISS subcircuits. The parameter passing requires the parameter tree syntax to be available in IBIS. The last part of the BIRD clarifies and improves the usage of D_to_A and A_to_D converters.

Several editorial changes were made in BIRD160.1 after discussions in the ATM task group. Walter Katz noted that he supported all the changes. Independent of BIRD160, there will be discussion in the ATM group regarding power connections to models. Since the current version of the specification has I-t tables, there is an implication that current drawn by the device will change the voltage levels of the model. He noted that [External Model] says that the voltages in the [Voltage Range], etc. determine what is hooked to the model. In [Model], the specification says the model is valid for the ranges indicated. We need to talk about what the [Voltage Range] means and how to deal with it.

Bob Ross noted that this BIRD was moved by ATM task group back to the Open Forum with the implication that it should be ready for a vote. Bob moved to schedule this BIRD for a vote at the next teleconference meeting. Ambrish Varma seconded the motion. There were no objections.

BIRD125.1: MAKE IBIS-ISS AVAILABLE FOR IBIS PACKAGE MODELING
Discussion was tabled.

BIRD128: ALLOW AMI_PARAMETERS_OUT TO PASS AMI_PARAMETERS_IN DATA ON CALLS TO AMI_GETWAVE
Discussion was tabled.

BIRD 131: IBIS-AMI REPEATERS
Discussion was tabled.

BIRD145.2: CASCADING IBIS I/O BUFFERS WITH [EXTERNAL CIRCUIT]S USING THE [MODEL CALL] KEYWORD
Discussion was tabled.

BIRD147: BACK-CHANNEL SUPPORT
Discussion was tabled.

BIRD150: IBIS-AMI NEW RESERVED PARAMETERS FOR DEPENDENCY TABLES
Discussion was tabled.

BIRD153.1: PARAMETER TREE KEYWORD
Discussion was tabled.

BIRD154: USING IBIS-AMI LEAF LABELS IN LIST PARAMETERS
Discussion was tabled.

BIRD155: NEW AMI API TO RESOLVE DEPENDENT MODEL PARAMETER
Discussion was tabled.

BIRD156.1: IBIS-AMI EXTENSION FOR MID-CHANNEL REDRIVER
Discussion was tabled.

BIRD157: PARAMETERIZE [DRIVER SCHEDULE]
Discussion was tabled.

BIRD158: AMI TOUCHSTONE ANALOG BUFFER MODELS
Discussion was tabled.

IBIS SPECIFICATION CHANGE STATUS
Michael Mirmak noted the document is now obsolete after today's votes.

The document is available at the following link:

> http://www.eda.org/ibis/docs/ibis-version-change-strategy-v2p7.pdf

IBISCHK5 PARSER AND BUG STATUS
Bob Ross introduced a new bug, BUG145. The bug is found in the testdata.c file, where a pointer name is incorrect. The impact of the mistake is not known, but it is easy to fix. Radek Biernacki noted that the pointer name must exist or the code wouldn't compile, so we should find out what impact it actually has. Classification of the bug was delayed until it could be investigated further.

NEW TECHNICAL ISSUES
Arpad Muranyi asked if submitting a new BIRD revision would automatically un-table it for discussion. Michael Mirmak confirmed that this is the case.

Arpad asked if Michael could add in the agenda an indication of status for BIRDs that are tabled, for instance if they were moved to the ATM task group for further discussion.

David Banas asked for time in the next meeting to give a short presentation related to the previous teleconference's discussion on V-t curves in AMI models and overclocking.

Mike LaBonte noted that Bob Ross is ready to go as the Model Review coordinator, and the web page discussed earlier in the meeting has gone live.

NEXT MEETING
The next IBIS Open Forum Summit meeting will be held May 15, 2013 after the SPI conference in Paris. No teleconference is available. The next IBIS Open Forum teleconference will be held May 17, 2013 from 8:00am to 10:00am US Pacific Time.

Arpad Muranyi moved to adjourn. Mike LaBonte seconded. There were no objections.

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NOTES

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This meeting was conducted in accordance with the TechAmerica Legal Guides and
TechAmerica Manual of Organization and Procedure.

The following e-mail addresses are used:

majordomo@eda.org
In the body, for the IBIS Open Forum Reflector:
subscribe ibis <your e-mail address>

In the body, for the IBIS Users' Group Reflector:
subscribe ibis-users <your e-mail address>

Help and other commands:
help

ibis-request@eda.org
To join, change, or drop from either or both:
IBIS Open Forum Reflector (ibis@eda.org)
IBIS Users' Group Reflector (ibis-users@eda.org)
State your request.

ibis-info@eda.org
To obtain general information about IBIS, to ask specific questions for individual response, and to inquire about joining the IBIS Open Forum as a full Member.

ibis@eda.org
To send a message to the general IBIS Open Forum Reflector. This is used mostly for IBIS Standardization business and future IBIS technical enhancements. Job posting information is not permitted.

ibis-users@eda.org
To send a message to the IBIS Users' Group Reflector. This is used mostly for IBIS clarification, current modeling issues, and general user concerns. Job posting information is not permitted.

ibis-bug@eda.org
To report ibischk parser BUGs as well as tschk2 parser BUGs. The BUG Report Form for ibischk resides along with reported BUGs at:

http://www.eda.org/ibis/bugs/ibischk/
http://www.eda.org/ibis/bugs/ibischk/bugform.txt

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

http://www.eda.org/ibis/tschk_bugs/
http://www.eda.org/ibis/tschk_bugs/bugform.txt

icm-bug@eda.org
To report icmchk1 parser BUGs. The BUG Report Form resides along with reported BUGs at:

http://www.eda.org/ibis/icm_bugs/
http://www.eda.org/ibis/icm_bugs/icm_bugform.txt

To report s2ibis, s2ibis2 and s2iplt bugs, use the Bug Report Forms which reside at:

> http://www.eda.org/ibis/bugs/s2ibis/bugs2i.txt
> http://www.eda.org/ibis/bugs/s2ibis2/bugs2i2.txt
> http://www.eda.org/ibis/bugs/s2iplt/bugsplt.txt

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

> http://www.eda.org/ibis

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

> http://www.eda.org/ibis/directory.html

To create an account on the TechAmerica KAVI workspace, check out:

> http://workspace.techamerica.org/kwspub/join/

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IBIS – TECHAMERICA STANDARDS BALLOT VOTING STATUS

I/O Buffer Information Specification Committee (IBIS)

Organization	Interest Category	Standards Ballot Voting Status	February 22, 2013	March 15, 2013	April 5, 2013	April 26, 2013
Agilent Technologies	User	Active	X	X	-	X
Altera	Producer	Active	X	-	X	X
ANSYS	User	Inactive	-	-	-	-
Applied Simulation Technology	User	Inactive	-	-	-	-
ARM	Producer	Inactive	-	-	-	-
Cadence Design Systems	User	Active	-	X	X	X
Ericsson	Producer	Inactive	-	X	-	-
Foxconn Technology Group	Producer	Inactive	-	-	-	-
Freescale	Producer	Inactive	-	-	-	-
Huawei Technologies	Producer	Inactive	-	-	-	-
IBM	Producer	Active	X	X	X	X
Infineon Technologies AG	Producer	Inactive	-	-	-	-
Intel Corp.	Producer	Active	-	X	X	X
IO Methodology	User	Active	-	X	X	-
LSI	Producer	Inactive	-	-	X	-
Maxim Integrated Products	Producer	Inactive	-	-	-	-
Mentor Graphics	User	Active	X	X	X	X
Micron Technology	Producer	Active	X	X	X	X
Nokia Siemens Networks	Producer	Inactive	-	-	-	-
QLogic	Producer	Inactive	-	-	-	-
Signal Integrity Software	User	Active	X	X	X	X
Synopsys	User	Inactive	-	X	-	-
Teraspeed Consulting	General Interest	Active	X	X	X	X
Texas Instruments	Producer	Inactive	-	-	-	-
Toshiba	Producer	Inactive	-	-	-	-
Xilinx	Producer	Inactive	-	-	-	-
ZTE	User	Inactive	-	-	-	-
Zuken	User	Inactive	-	-	-	-

CRITERIA FOR MEMBER IN GOOD STANDING:

- MUST ATTEND TWO CONSECUTIVE MEETINGS TO ESTABLISH VOTING MEMBERSHIP
- MEMBERSHIP DUES CURRENT
- MUST NOT MISS TWO CONSECUTIVE MEETINGS

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- 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.