# AGENDA AND GENERAL INFORMATION
## IEEE P802.3CK - 100 GB/S, 200 GB/S, AND 400 GB/S ELECTRICAL INTERFACES TASK FORCE

BETH KOCHUPARAMBIL, EMPLOYED BY AND AFFILIATED WITH CISCO SYSTEMS
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SPOKANE, WA, USA – SEPTEMBER 12-13, 2018

# AGENDA

- Welcome and Introductions
- Approve Agenda
- Approve July Plenary Minutes
- Ground Rules
- IEEE Structure, Bylaws and Rules / Call for Patents / IEEE Standards Process
- Reflector and Web
- Goals for this meeting
- Liaisons and Communications
- Presentations
- Motions and Closing Business
- Future Meetings

# TASK FORCE DECORUM

- An officer is permitted to make an audio or slideshow recording of this meeting exclusively for the purpose of generating minutes which shall not be copied or distributed. **IEEE 802.3 meetings do not use this option.** Recording of the proceedings by any other participant or observer, in part or in whole, via any means, is prohibited. (December 2017 IEEE-SA Standards Board Ops Manual 5.3.3.2)

- Press (i.e., anyone reporting publicly on this meeting) are to announce their presence (December 2017 IEEE-SA Standards Board Ops Manual 5.3.3.3)

- Cell phone ringers off

- Wear your badges at all times in meeting areas
  - Help the hotel security staff improve the general security of the meeting rooms
  - **PCs HAVE BEEN STOLEN** at previous meetings
  - **DO NOT** assume that meeting areas are secure

- Please observe proper decorum in meetings

# GROUND RULES

- Based upon IEEE 802.3 Rules
    - Foundation based upon Robert's Rules of Order
    - Anyone in the room may speak
    - Anyone in the room may vote
- **RESPECT**… give it, get it
- NO product pitches
- NO corporate pitches
- NO prices!!!
    - This includes costs, ASPs, etc. no matter what the currency
- NO restrictive notices

# IEEE STRUCTURE

**IEEE-SA**
**Standards Association**

Standards | Process

**IEEE-SA**
Standards Board

**RevCom**
Review Committee

**NesCom**
New Stds. Committee

**IEEE 802**
Sponsor Group

**IEEE 802.3**
Working Group

IEEE 802.3
Task Force

**Approval Process**

**Standards Process**

**Technical Activities**

# IMPORTANT BYLAWS AND RULES

- **IEEE-SA Operations Manual**
  http://standards.ieee.org/develop/policies/sa_opman/

- **IEEE-SA Standards Board Bylaws**
  http://standards.ieee.org/develop/policies/bylaws/

- **IEEE-SA Standards Board Operations Manual**
  http://standards.ieee.org/develop/policies/opman/

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Policies and Procedures**
  http://standards.ieee.org/about/sasb/audcom/pnp/LMSC.pdf

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Operations Manual**
  http://www.ieee802.org/devdocs.shtml

- **IEEE 802 LAN/MAN Standards Committee (LMSC) Working Group (WG) Policies and Procedures**
  http://www.ieee802.org/devdocs.shtml

- **IEEE 802.3 Working Group Operating Rules**
  http://ieee802.org/3/rules/P802_3_rules.pdf

# Instructions for the WG Chair

**The IEEE-SA strongly recommends that at each WG meeting the chair or a designee:**

- **Show slides #1 through #4 of this presentation**
- **Advise the WG attendees that:**
  - IEEE's patent policy is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
  - Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
  - There may be Essential Patent Claims of which IEEE is not aware. Additionally, neither IEEE, the WG, nor the WG Chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.

- **Instruct the WG Secretary to record in the minutes of the relevant WG meeting:**
  - That the foregoing information was provided and that slides 1 through 4 (and this slide 0, if applicable) were shown;
  - That the chair or designee provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) of which the participant is personally aware and that may be essential for the use of that standard
  - Any responses that were given, specifically the patent claim(s)/patent application claim(s) and/or the holder of the patent claim(s)/patent application claim(s) that were identified (if any) and by whom.

- The WG Chair shall ensure that a request is made to any identified holders of potential essential patent claim(s) to complete and submit a Letter of Assurance.
- It is recommended that the WG Chair review the guidance in *IEEE-SA Standards Board Operations Manual* 6.3.5 and in FAQs 14 and 15 on inclusion of potential Essential Patent Claims by incorporation or by reference.

  Note: **WG** includes Working Groups, Task Groups, and other standards-developing committees with a PAR approved by the IEEE-SA Standards Board.

(Optional to be shown)

IEEE

# PARTICIPANTS HAVE A DUTY TO INFORM THE IEEE

- **Participants <u>shall</u> inform the IEEE (or cause the IEEE to be informed) of the identity of each holder of any potential Essential Patent Claims of which they are personally aware if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents**

- **Participants <u>should</u> inform the IEEE (or cause the IEEE to be informed) of the identity of any other holders of potential Essential Patent Claims**

# Early identification of holders of potential Essential Patent Claims is encouraged

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◈IEEE

# WAYS TO INFORM IEEE

- **Cause an LOA to be submitted to the IEEE-SA (patcom@ieee.org); or**

- **Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or**

- **Speak up now and respond to this Call for Potentially Essential Patents**

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair

◆IEEE

# OTHER GUIDELINES FOR IEEE WG MEETINGS

- **All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.**

  - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**

  - **Don't discuss specific license rates, terms, or conditions.**

    - Relative costs of different technical approaches that include relative costs of patent licensing terms may be discussed in standards development meetings.

      - **Technical considerations remain the primary focus**

  - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**

  - **Don't discuss the status or substance of ongoing or threatened litigation.**

  - **Don't be silent if inappropriate topics are discussed … do formally object.**

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For more details, see *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and
*Antitrust and Competition Policy: What You Need to Know* at http://standards.ieee.org/develop/policies/antitrust.pdf

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02 January 2018

◈IEEE

# PATENT-RELATED INFORMATION

The patent policy and the procedures used to execute that policy are documented in the:

- *IEEE-SA Standards Board Bylaws*
  (http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6)
- *IEEE-SA Standards Board Operations Manual*
  (http://standards.ieee.org/develop/policies/opman/sect6.html#6.3)

Material about the patent policy is available at
*http://standards.ieee.org/about/sasb/patcom/materials.html*

# If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org

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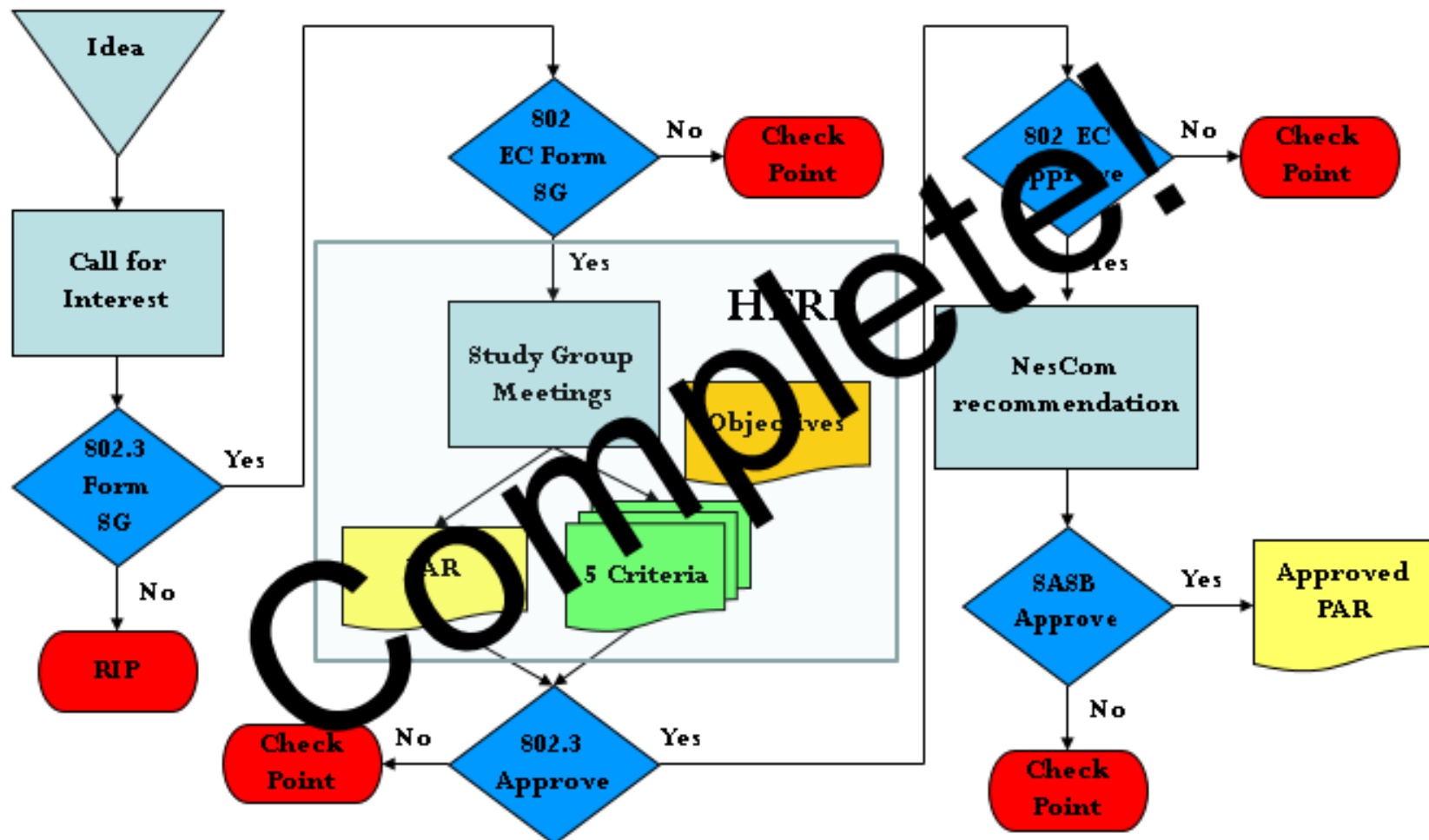
◈IEEE

# Participation in IEEE 802 Meetings

**Participation in any IEEE 802 meeting (Sponsor, Sponsor subgroup, Working Group, Working Group subgroup, etc.) is on an individual basis**

- Participants in the IEEE standards development individual process shall act based on their qualifications and experience. (https://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf section 5.2.1)

- IEEE 802 Working Group membership is by individual; "Working Group members shall participate in the consensus process in a manner consistent with their professional expert opinion as individuals, and not as organizational representatives". (subclause 4.2.1 "Establishment", of the IEEE 802 LMSC Working Group Policies and Procedures)

- Participants have an obligation to act and vote as an individual and not under the direction of any other individual or group.  A Participant's obligation to act and vote as an individual applies in all cases, regardless of any external commitments, agreements, contracts, or orders.

- Participants shall not direct the actions or votes of any other member of an IEEE 802 Working Group or retaliate against any other member for their actions or votes within IEEE 802 Working Group meetings, see https://standards.ieee.org/develop/policies/bylaws/sb_bylaws.pdf section 5.2.1.3 and the IEEE 802 LMSC Working Group Policies and Procedures, subclause 3.4.1 "Chair", list item x.

**By participating in IEEE 802 meetings, you accept these requirements. If you do not agree to these policies then you shall not participate.**

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(Latest revision of IEEE 802 LMSC Working Group Policies and Procedures: http://www.ieee802.org/devdocs.shtml)

# Overview of IEEE 802.3 Standards Process (1/5)- Study Group Phase

Note: At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

# Overview of IEEE 802.3 Standards Process (2/5) – Task Force Comment Phase
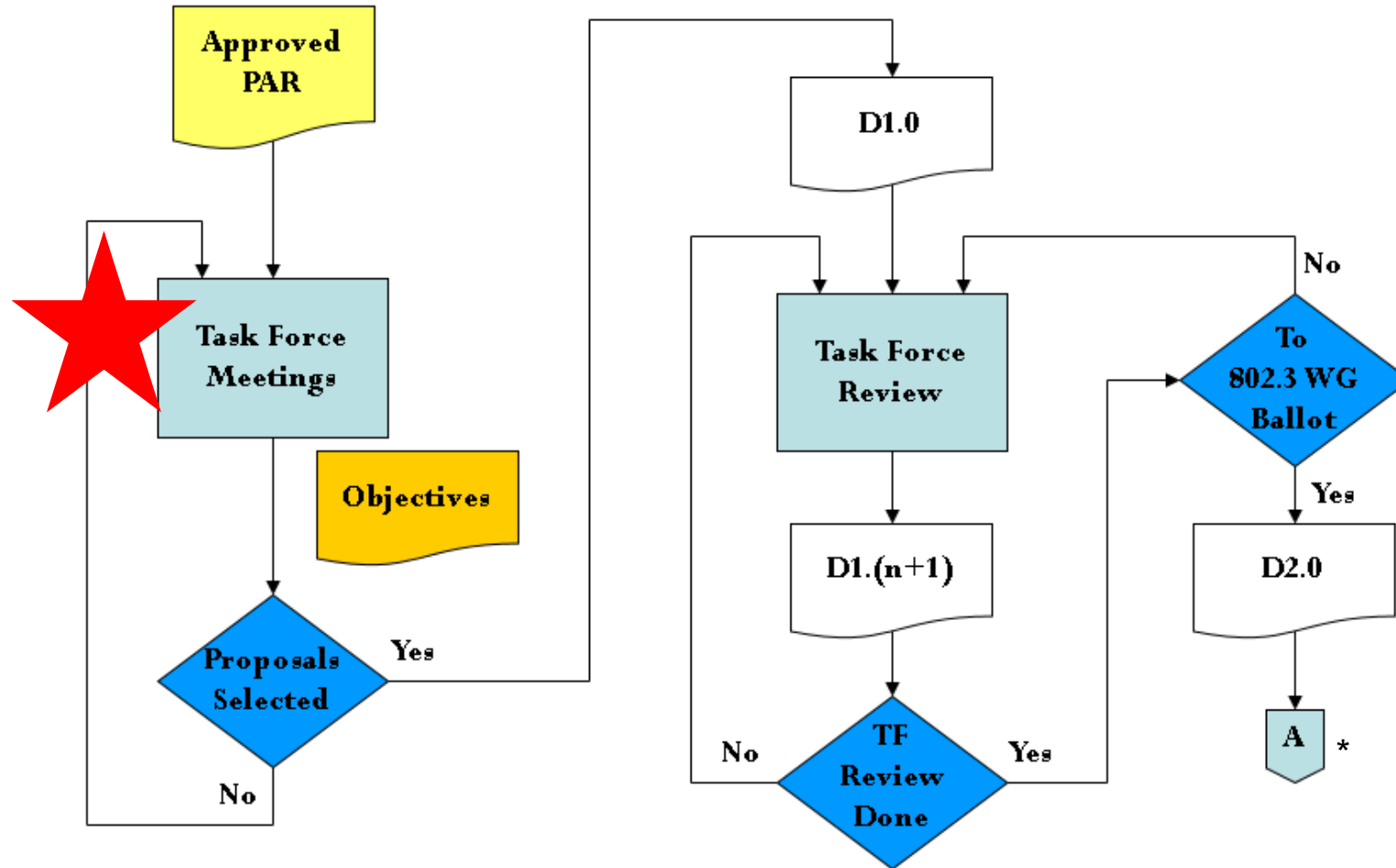
Overview of IEEE 802.3 Standards Process (3/5) – Working Group Ballot Phase

# Overview of IEEE 802.3 Standards Process (4/5)- Sponsor Ballot Phase



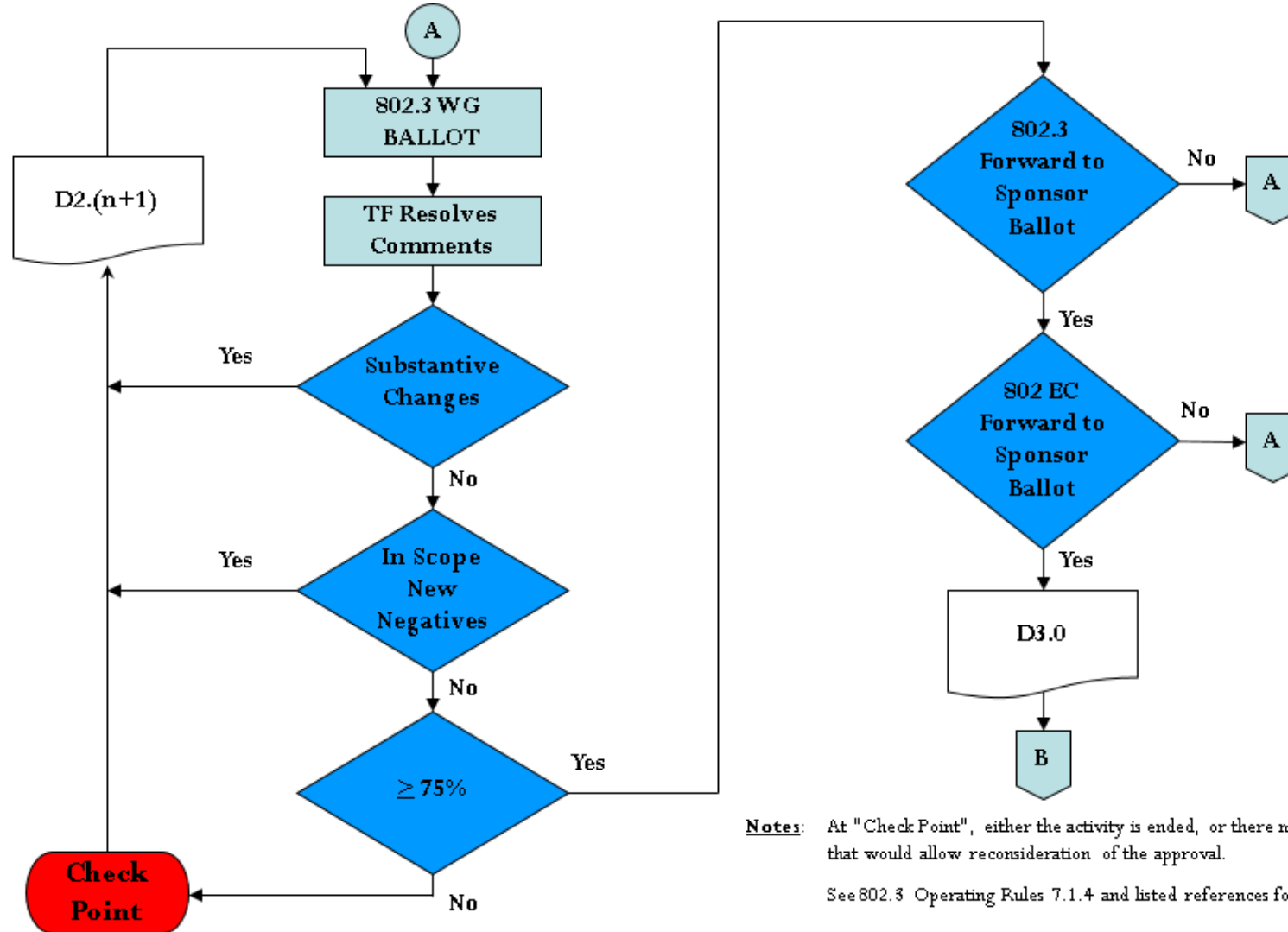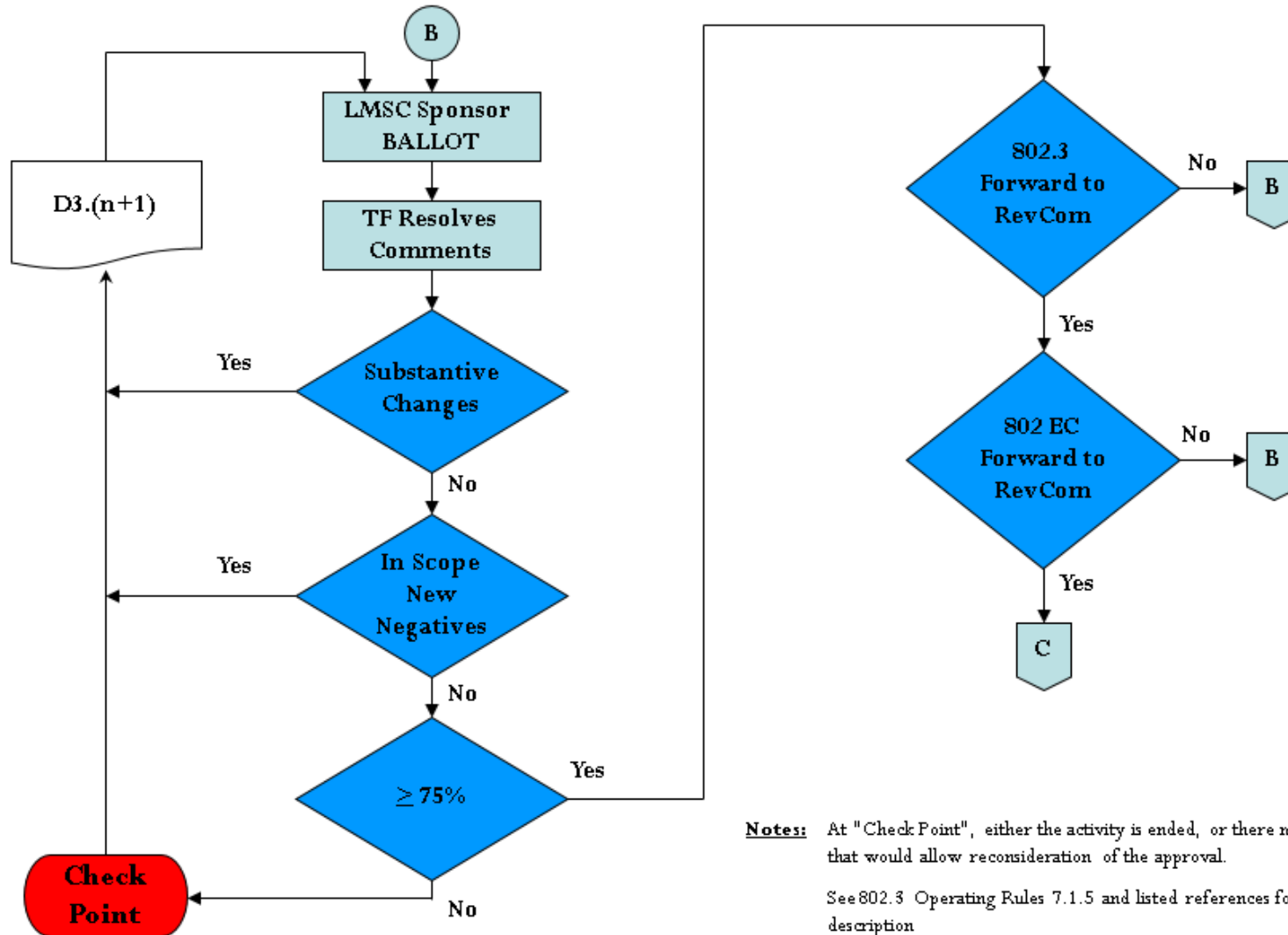**Notes:** At "Check Point", either the activity is ended, or there may be various options that would allow reconsideration of the approval.

See 802.3 Operating Rules 7.1.5 and listed references for complete description

# Overview of IEEE 802.3 Standards Process (5/5) – Final Approvals / Standard Release
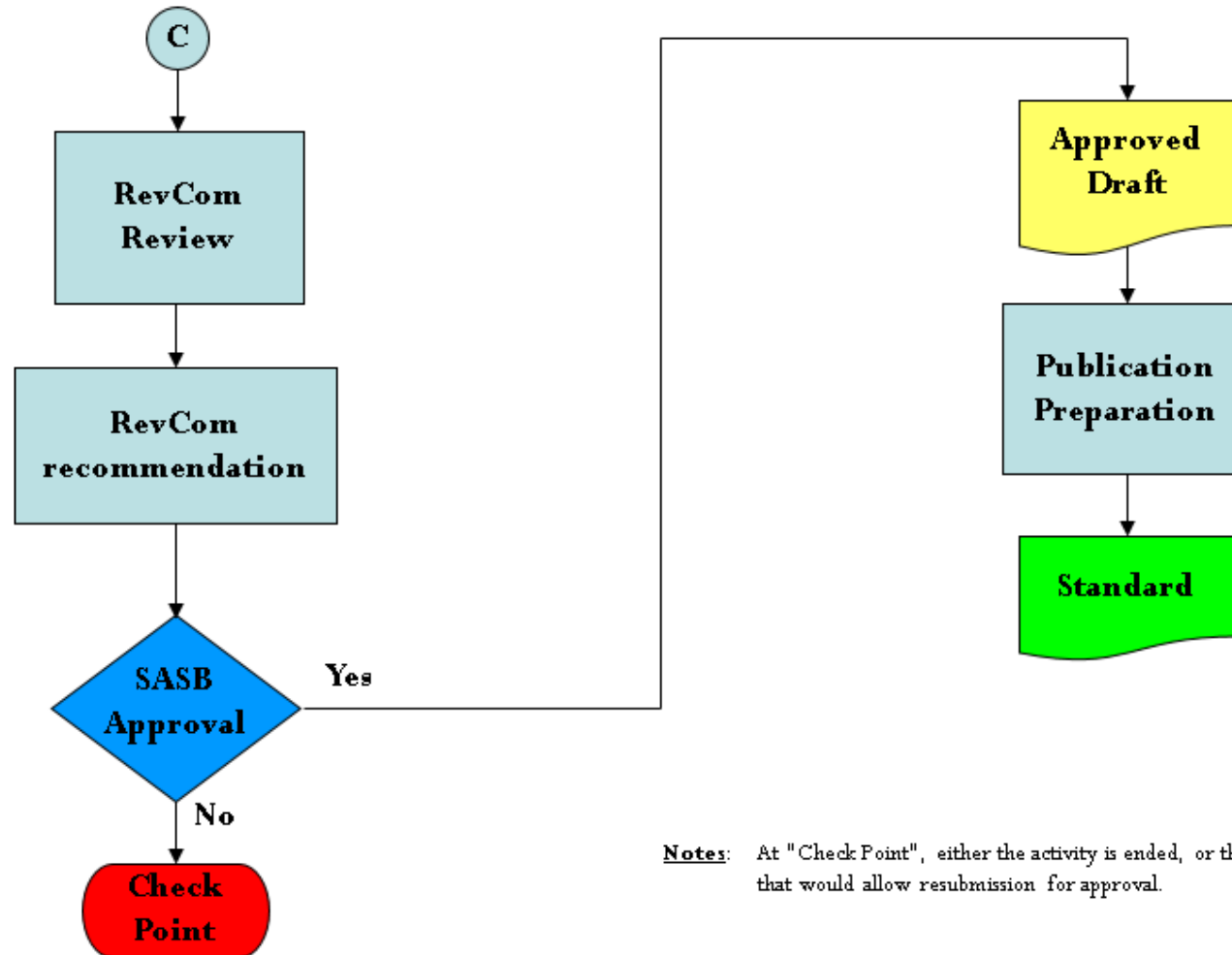
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RevCom Review

RevCom recommendation

SASB Approval

Yes

No

Check Point

Approved Draft

Publication Preparation

Standard

**Notes**: At "Check Point", either the activity is ended, or there may be various options that would allow resubmission for approval.

## IEEE P802.3CK – 100 GB/S, 200 GB/S, 400 GB/S ELECTRICAL INTERFACES TASK FORCE -
# APPROVED PROJECT DOCUMENTS

- PAR: http://www.ieee802.org/3/ck/P802_3ck_PAR_140518.pdf

- CSD: http://www.ieee802.org/3/ck/P802_3ck_CSD_06apr18.pdf

- Objectives: http://www.ieee802.org/3/ck/P802_3ck_Objectives_2018mar.pdf

# REFLECTOR AND WEB

- To subscribe to the 100GEL reflector, send an email to:
  *ListServ@ieee.org*

  with the following in the body of the message (do not include "<>"):

  > *subscribe* **STDS-802-3-100GEL** *<yourfirstname> <yourlastname>*
  >
  > *end*

- Send 100GEL reflector messages to:
  *STDS-802-3-100GEL@LISTSERV.IEEE.ORG*

- Task Force web page URL:

  *http://www.ieee802.org/3/ck/index.html*

# ATTENDANCE

- Tutorial Material on attendance tool

  - http://ieee802.org/3/minutes/attendance_procedures.pdf

- Access details

  - URL: http://imat.ieee.org/

  - You may need to sign off your VPN to record attendance

- Access Code for this meeting: <given in the meeting>

# ACTION ITEMS FROM JULY (1)

- Power analysis of C2M interface
- Impacts of a programmable interface
- Identify the module constraints
- Identify what MDIs are needed
- Provide Short C2M Channels
- Provide C2M Channels with various MDI
- Identify package model(s) that should be considered for C2M

# ACTION ITEMS FROM JULY (2)

- What architecture is needed to achieve our backplane objective
  - →Determine Reference Receiver
- Identify the must-have backplane channels
  - →Feasibility analysis by own simulators
  - →Determine COM Parameters
    - →Verify COM parameters are feasible with realistic ASIC and package
- Identify metrics for reporting analysis (COM, VEC, BER, etc.)
- Identify package model(s) that should be considered
  - Including package crosstalk
- FEC error analysis
- Power analysis of Backplane, Cu Cable, and C2C interfaces

# GOALS FOR THE MEETING

- Continue technical discussions
- Begin narrowing focus towards baseline creation
- Adopt a timeline

- Topics of Conversation
  - C2M Budget/Equalization
  - Package Model
  - FEC Analysis
  - COM Architecture/Modifications
  - Backplane/Cu Cable

# TIMELINE

- Can we adopt a timeline this meeting?

- Timeline proposal in presentations

  - http://www.ieee802.org/3/ck/public/18_09/kochuparambil_3ck_01_0918.pdf

  - All baselines adopted by March

  - Final draft reviews in November2020

# LIAISONS AND COMMUNICATIONS

- *No incoming liaisons or communications*

# WEDNESDAY

| Time | Presenter | Affiliation | Title | File Name | Duration |
|---|---|---|---|---|---|
| 8:00 AM | Beth Kochuparambil | Cisco | Agenda | agenda_3ck_01_0918 | 0:40 |
| | Brian Welch | Luxtera | Power Considerations for 400GAUI-4 | welch_3ck_01_0918 | 0:20 |
| | David Ofelt | Juniper | Host ASIC-to-module connectivity | ofelt_3ck_01_0918 | 0:20 |
| | Phil Sun | Credo | 100G SERDES Power Study | sun_3ck_01_0918 | 0:30 |
| | Ali Ghiasi | Ghiasi Quantum | C2M Methodology and Architectural Consideration | ghiasi_3ck_02_0918 | 0:30 |
| 10:30 AM | BREAK | | | | 0:15 |
| | Mike Peng Li | Intel | Typical TX FFE + RX CTLE/FFE vs. Longer TX FFE + RX CTLE | li_3ck_01_0918 | 0:30 |
| | Jane Lim | Cisco | C2M Channel Analysis Update | lim_3ck_01_0918 | 0:20 |
| Noon | BREAK | | | | 1:15 |
| | Ali Ghiasi | Ghiasi Quantum | Initial C2M Simulation Results and choice of CTLE | ghiasi_3ck_01_0918 | 0:20 |
| | Adee Ran | Intel | Thoughts about adaptive transmitter FFE for .3ck Chip-to-Module | ran_3ck_01_0918 | 0:40 |
| | Jeff Slavick | Broadcom | C2M Options Trade-offs | slavick_3ck_02_0918 | 0:40 |
| 3:00 PM | BREAK | | | | 0:20 |
| | Discussion & Straw Polls | | | | |
| | Liav Ben-Artsi | Marvell | Physical aspects of package design for 100Gbps/lane | benartsi_3ck_01_0918 | 0:20 |
| | Rich Mellitz | Samtec | Flexible Package Modeling for COM | mellitz_3ck_01_0918 | 0:20 |
| | Toshiaki Sakai | Socionext | 100Gb/s Backplane Channel Simulation | sakai_3ck_01_0918 | 0:20 |
| | Discussion & Straw Polls | | | | |
| | Jeff Slavick | Broadcom | Cl 73 AN Baseline proposal for 802.3ck | slavick_3ck_01_0918 | 0:20 |
| | BREAK FOR THE DAY | | | | |

# THURSDAY

| Time | Presenter | Affiliation | Title | File Name | Duration |
|---|---|---|---|---|---|
| 8:00 AM | Beth Kochuparambil | Cisco | Opening | | 0:10 |
| | ~~Beth Kochuparambil~~ | ~~Cisco~~ | ~~Timeline Discussion~~ (WITHDRAWN) | ~~kochuparambil_3ck_01_0918~~ | |
| | Pete Anslow | Ciena | RS(544,514) FEC performance with 4:1 interleaving (updated 2) | anslow_3ck_01_0918 | 0:30 |
| | Geoff Zhang | Xilinx | Preliminary Studies on 1/(1+D) Precoding, DFE Error Propagation, and Impact on KR | zhang_3ck_01_0918 | 0:40 |
| | Greg McSorley | Amphenol | 100GEL DSFP MDI Proposal for 802.3ck | mcsorley_3ck_01_0918 | 0:20 |
| | Greg McSorley | Amphenol | 100GEL OSFP MDI Proposal for 802.3ck | mcsorley_3ck_02_0918 | 0:20 |
| 10:30 AM | BREAK | | | | 0:15 |
| | Nathan Tracy | TE Connectivity | Supporting Data To Demonstrate 100Gbps Capability of Proposed MDIs | tracy_3ck_01_0918 | 0:20 |
| | Tom Palkert | Molex | SFP-DD Overview | palkert_3ck_02_0918 | 0:20 |
| | Tom Palkert | Molex | 802.3ck 100G Serial Copper MDIs | palkert_3ck_01_0918 | 0:20 |
| 12:00 PM | BREAK | | | | 1:15 |
| | Greg McSorley | Amphenol | 100GEL MTF Measurements Methods | mcsorley_3ck_03_0918 | 0:20 |
| | Chris DiMinico | MC Communications | Baseline proposals for twin-axial copper | diminico_3ck_01_0918 | 0:40 |
| | Discussion & Straw Polls | | | | |
| | Ramin Farjad | Aquantia | PHY requirements and estimated power consumption | farjadrad_3ck_01_0918 | 0:30 |
| | Rich Mellitz | Samtec | Equalization vs. Package Model | mellitz_3ck_02_0918 | 0:40 |
| 3:00 PM | BREAK | | | | 0:20 |
| | Yuchun Lu | Huawei | A Proposed ADC-DSP Receiver Reference Model for COM | lu_3ck_01_0918 | 0:20 |
| | Adee Ran | Intel | Possible tools for improving performance in electrical links | ran_3ck_02_0918 | 0:25 |
| | Mau-Lin Wu | Media-Tek | *(late)* FFE and DFE Coefiecient Calculation | wu_3ck_01_0918 | 0:30 |
| | Mike Peng Li | Intel | *(late)* 112 Gbp COM Investigations for Backplane with a 20 mm Reference Package | li_3ck_02_0918 | 0:30 |
| 6:00 PM | CLOSE OF MEETING - Working Group Mtg starts @ 6:30 PM | | | | |

# FUTURE MEETINGS

- November Plenary – Bangkok, Thailand
  - Week of November 12th
  - http://802world.org/plenary  (Registration is open, Early Registration Deadline: Sept 28th)

- January Interim – Long Beach, CA, USA
  - Week of January 14th

- March Plenary – Vancouver, BC, Canada
  - Week of March 11th

- See http://www.ieee802.org/3/interims/index.html for more information
- Anyone interested in hosting a interim meeting contact me or the IEEE 802.3 Executive Secretary Steve Carlson.

# FUTURE MEETINGS

- Likely to be three 2hour Ad Hocs between now and November.
  - Hoping to utilize the already known Wednesday time slot.
  - Possibly starting Oct. 3rd
  - Watch reflector for announcement

| September | | | | | | |
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# THANK YOU!