Agenda and General Information

IEEE P802.3cg 10 Mbps Single Pair Ethernet Task Force

George Zimmerman (Chair)

CME Consulting, Inc.
New Orleans, LA USA, May 24-26, 2017

Agenda

- Appointment of Recording Secretary
- Welcome and Introductions
- Approve Agenda
- Approve March Task Force Minutes
- Goals for this meeting
- Big Ticket Items
- Reflector and Web
- Ground Rules
- IEEE
    - Structure, Bylaws and Rules
    - Call for Patents
    - IEEE Standards Process
- Liaisons and Communications
- Presentations
- Motions and Closing Business
- Future Meetings

Task Force Decorum

- Photography or recording by permission only (December 2014 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 2014 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

Study Group Decorum

- Photography or recording by permission only (December 2014 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 2014 IEEE-SA Standards Board Ops Manual 5.3.3.3)
- Cell phone ringers off
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Goals for the meeting

- Continue to work on selection of a set of baseline proposals
  - Hear updates on long reach baseline PHY
  - Hear proposals to complete link segments
  - Hear proposals on Automotive multi-drop PHY and link segment
  - Hear proposals on powering

  - IDENTIFY ANY GAPS

- Lay the ground work for the next meeting

Big ticket items

- Understand our overlap with NGAUTO

- Progress long-reach PHY baseline for adoption
  - Adopt or identify what we need to know to adopt
- Strawman powering scenarios
- Multi-drop - !?!?
- Stretch goal - baseline remaining Link Segments

Reflector and Web

- To subscribe to the 10 Mbps Single-Pair Ethernet Task Force reflector, send an email to:

  ListServ@ieee.org

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

  subscribe **STDS-802-3-10SPE-**_<yourfirstname> <yourlastname>_

  end

THIS IS THE SAME REFLECTOR WE USED FOR STUDY GROUP – YOU DO NOT HAVE TO RE-SUBSCRIBE

- Send 10 Mbps Single-Pair Ethernet Task Force reflector messages to:

  STDS-802-3-10SPE _@listserv.ieee.org_

- Task Force web page URL: (NEW WEB PAGE FOR TASK FORCE)

  www.ieee802.org/3/cg

Task Force Private Area

- PRIVATE AREA Defined
- URL: http://www.ieee802.org/3/cg/private
  - Username: <<>>
  - Password: <<>>

- Write it down…

- Note - The draft, and any other content, is posted for your review only, and neither the content nor access information should be copied or redistributed to others in violation of document copyrights.

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

Attendance

- Tutorial Material on attendance tool
  - http://ieee802.org/3/minutes/attendance_procedures.pdf

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

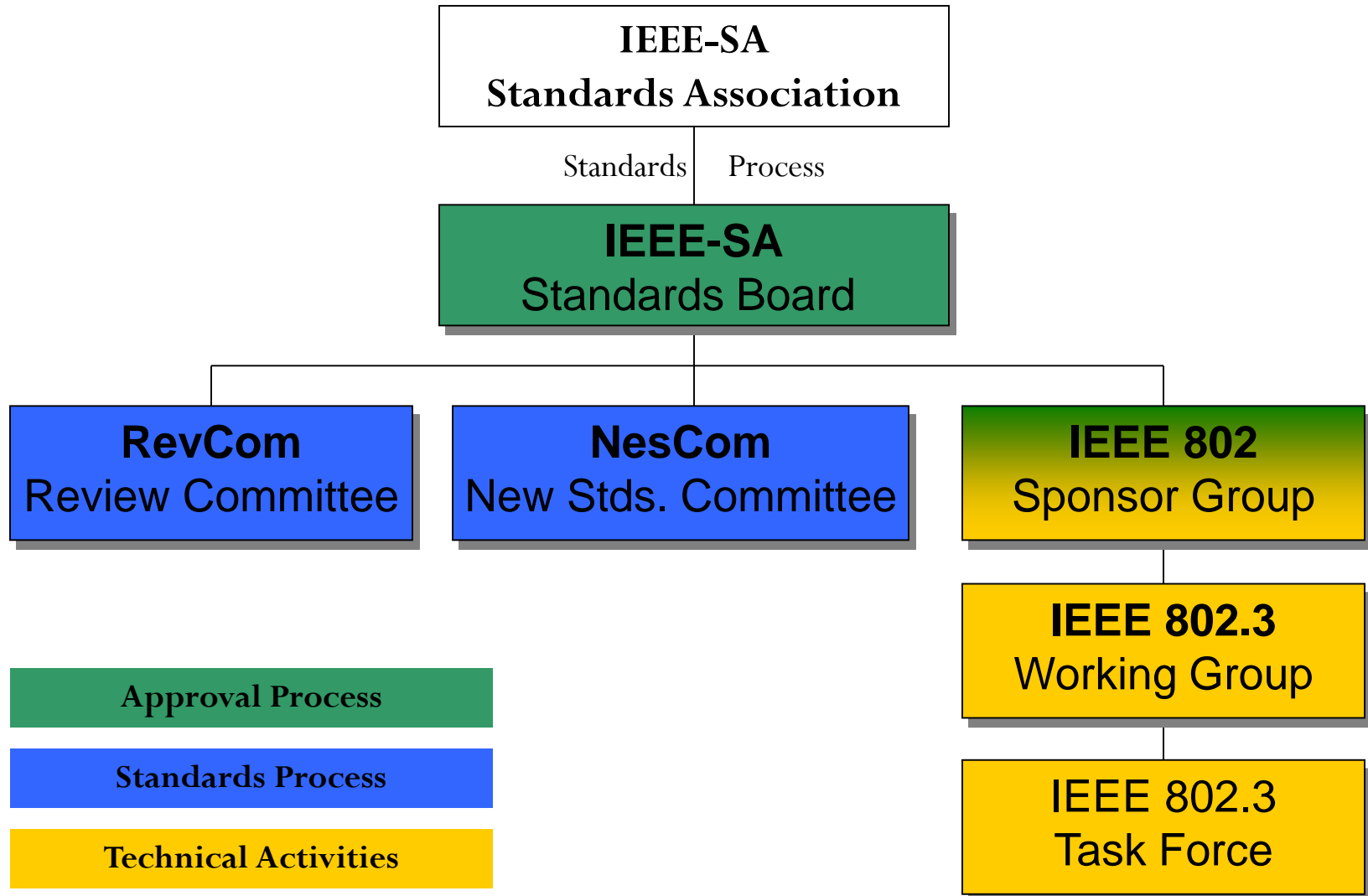# Participation in IEEE 802 Meetings

All participation in IEEE 802 Working Group meetings 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.

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

IEEE 802 Executive Committee

Slide 11

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:**
  - The 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 the IEEE is not aware. Additionally, neither the 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.

15 March 2015

◈ IEEE

(Optional to be shown)

Participants, Patents, and Duty to Inform

All participants in this meeting have certain obligations under the IEEE-SA Patent Policy.

- **Participants [Note: Quoted text excerpted from IEEE-SA Standards Board Bylaws subclause 6.2]:**
    - **"Shall 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**
    - **"Should inform the IEEE (or cause the IEEE to be informed)" of the identity of "any other holders of potential Essential Patent Claims" (that is, third parties that are not affiliated with the participant, with the participant's employer, or with anyone else that the participant is from or otherwise represents)**
- **The above does not apply if the patent claim is already the subject of an Accepted Letter of Assurance that applies to the proposed standard(s) under consideration by this group**
- **Early identification of holders of potential Essential Patent Claims is strongly encouraged**
- **No duty to perform a patent search**

◈ **IEEE**

Patent Related Links

All participants should be familiar with their obligations under the IEEE-SA Policies & Procedures for standards development.

Patent Policy is stated in these sources:

IEEE-SA Standards Boards 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 or visit http://standards.ieee.org/about/sasb/patcom/index.html

This slide set is available at https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset.ppt

◈IEEE

15 March 2015
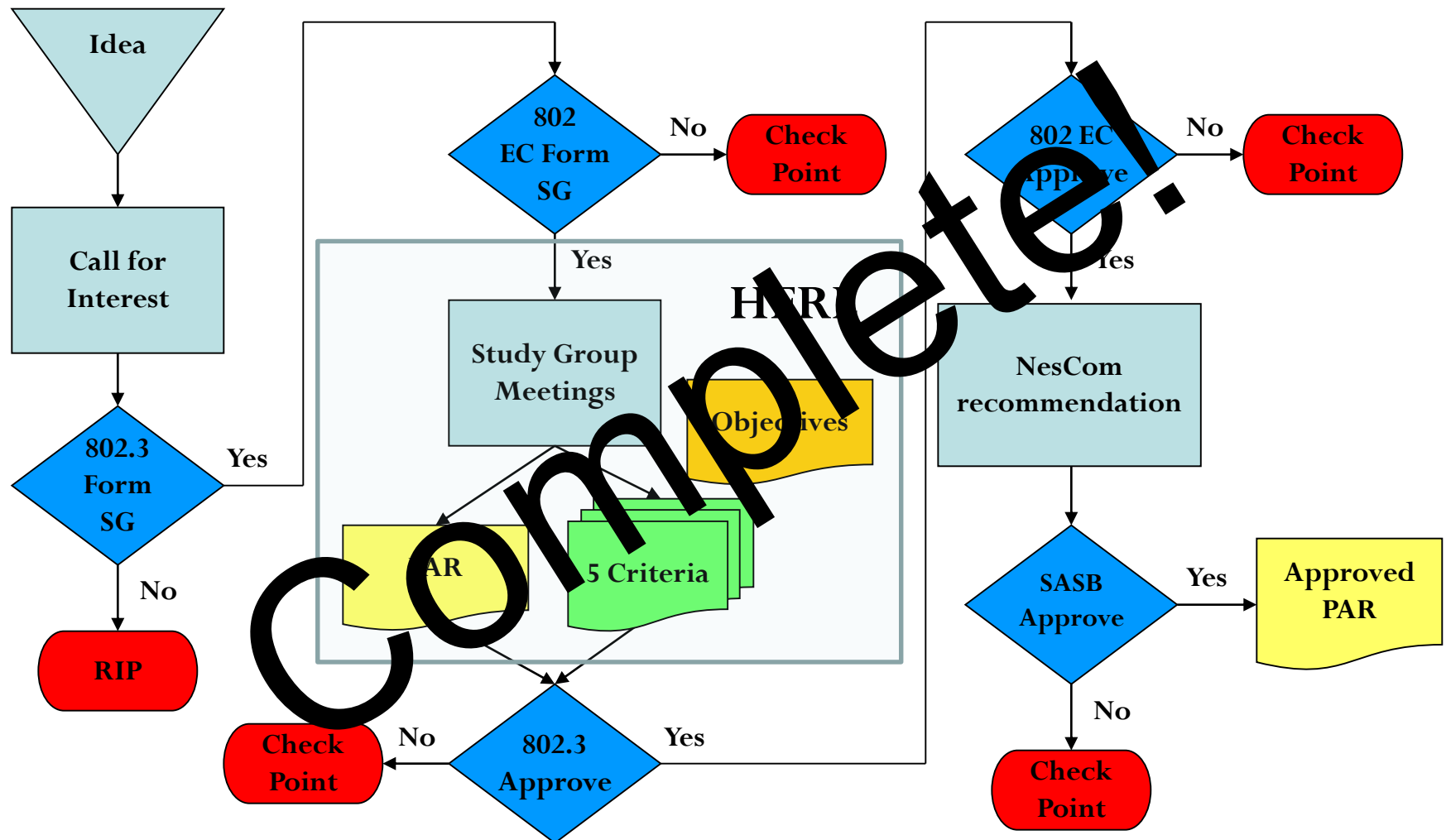
Call for Potentially Essential Patents

- 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:
  - Either speak up now 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
  - Cause an LOA to be submitted

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, including licensing costs of essential patent claims, of different technical approaches may be discussed in standards development meetings.

      - Technical considerations remain 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.**

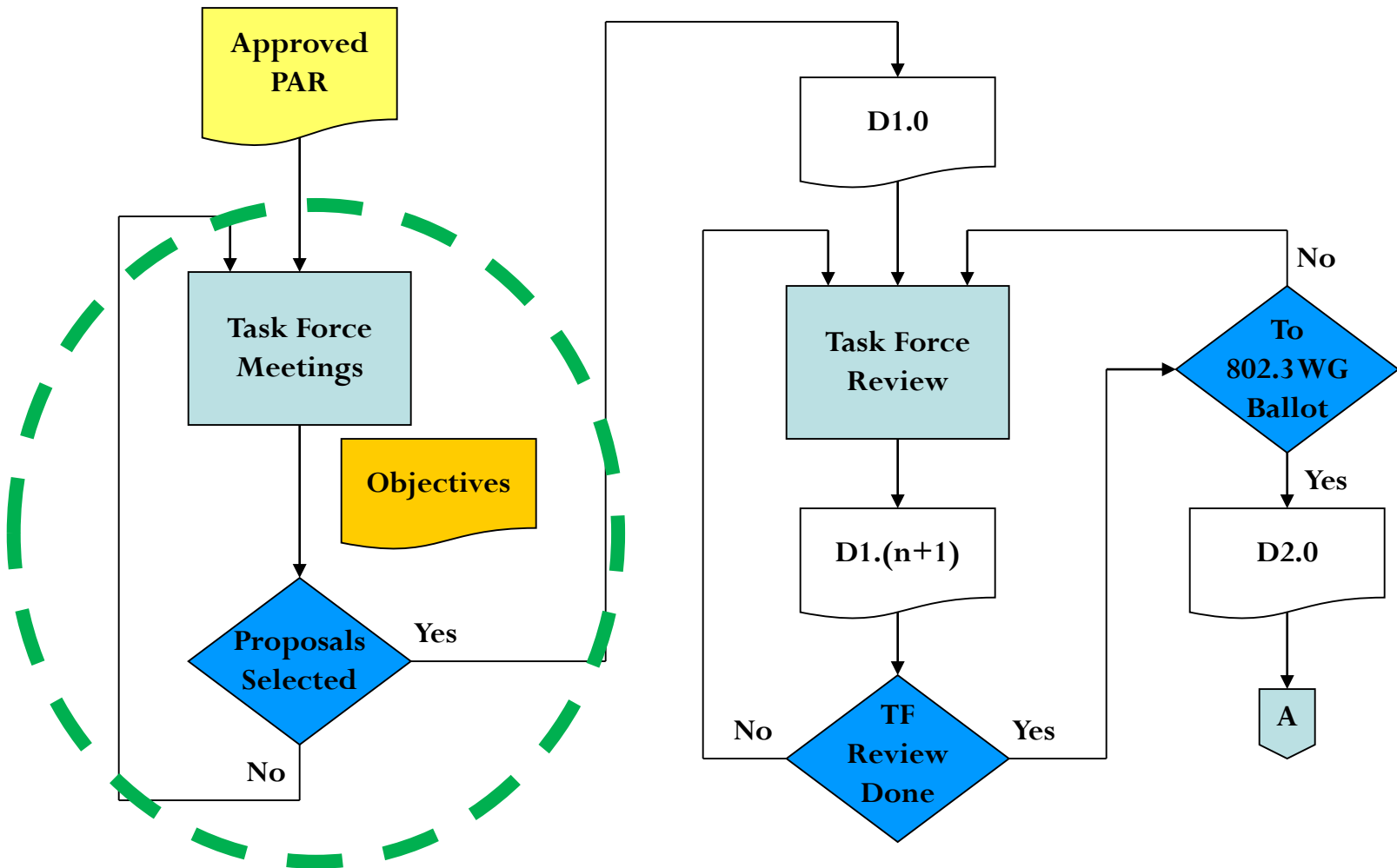---

See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and "Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy" for more details.
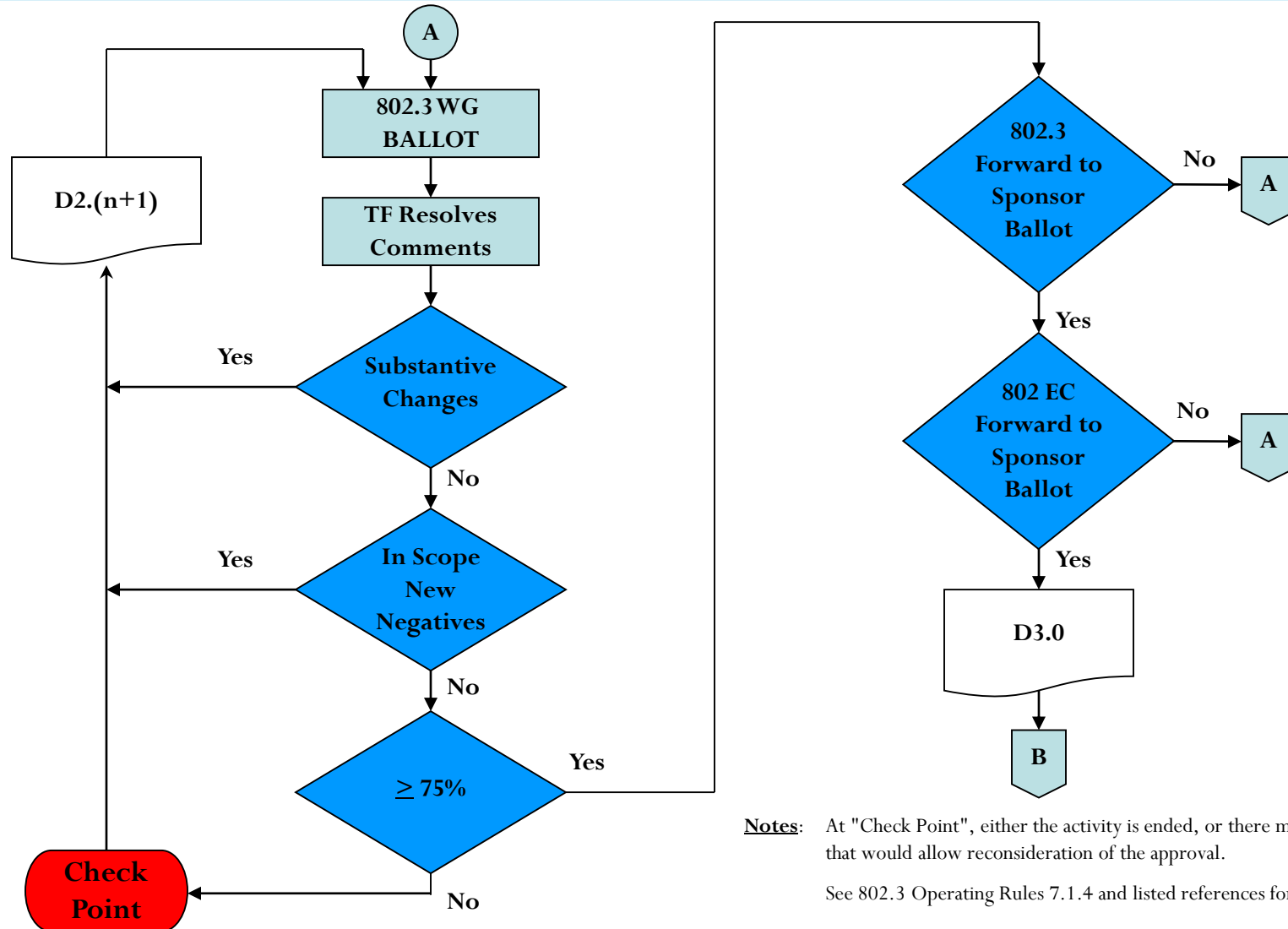
15 March 2015

IEEE

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 (3/5) – Working Group Ballot Phase

A

802.3 WG BALLOT

D2.(n+1)

TF Resolves Comments

Substantive Changes — Yes

In Scope New Negatives — Yes

No

≥ 75% — Yes / No

Check Point

802.3 Forward to Sponsor Ballot — No → **A**

Yes

802 EC Forward to Sponsor Ballot — No → **A**

Yes

D3.0

B

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

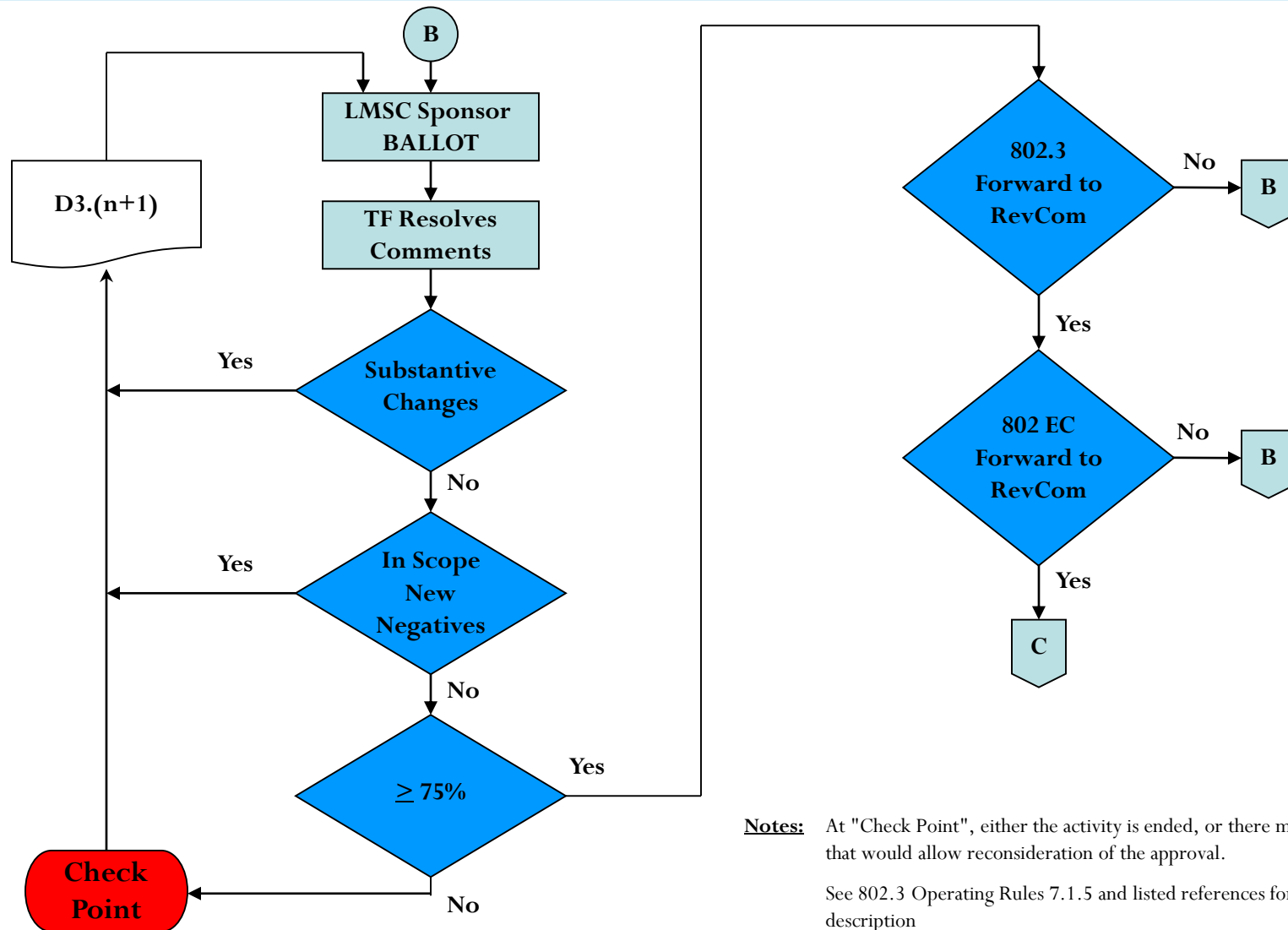See 802.3 Operating Rules 7.1.4 and listed references for complete description

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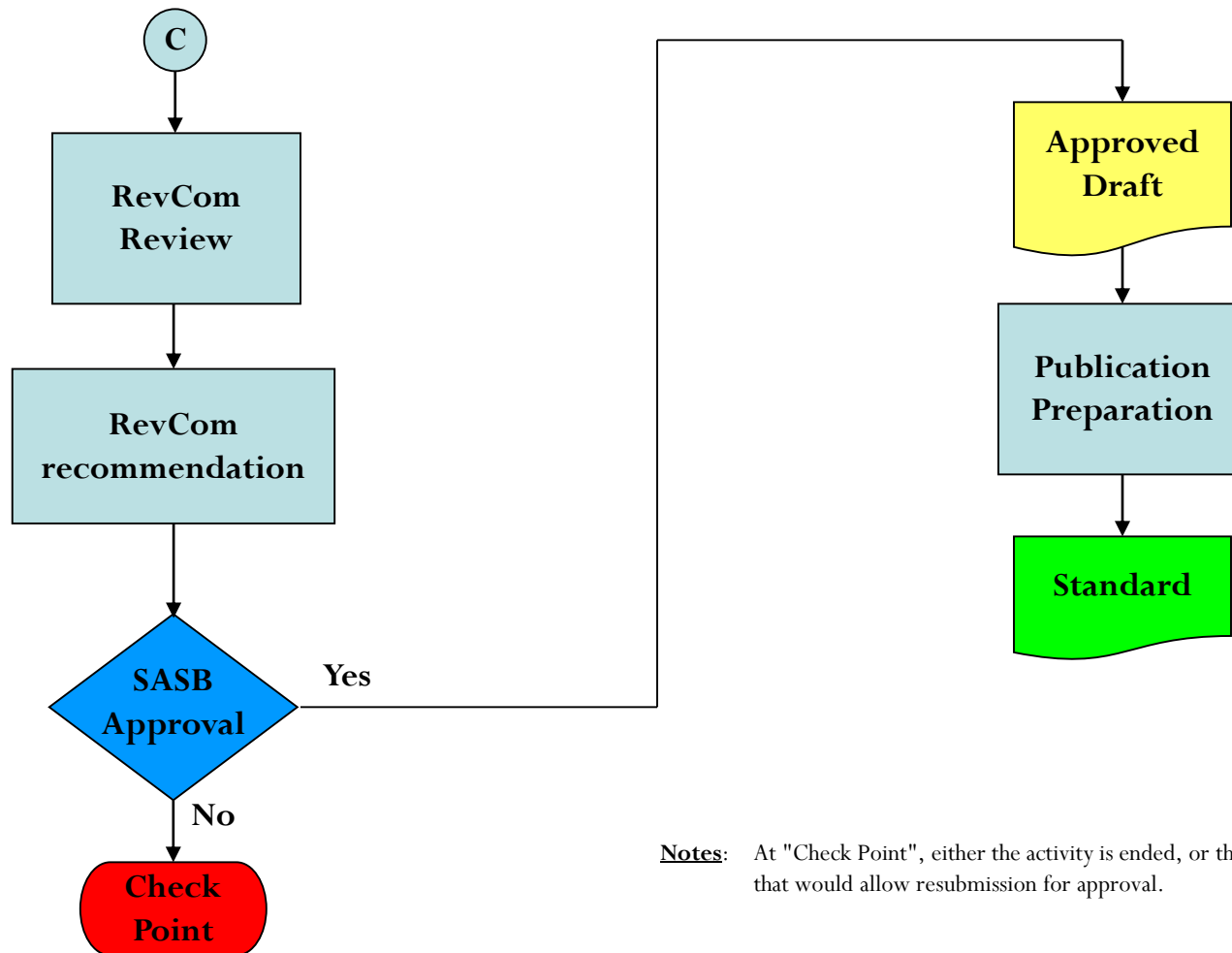
Overview of IEEE 802.3 Standards Process (5/5) – Final Approvals / Standard Release

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

Liaisons and Communications

IEEE P802.3cg 10Mbps Single-Pair Ethernet Approved Project Documents

- PAR

  - http://www.ieee802.org/3/cg/IEEE_P802_3cg_PAR_071216.pdf

- 5 Criteria

  - https://mentor.ieee.org/802-ec/dcn/16/ec-16-0153-00-00EC-ieee-p802-3cg-draft-csd.pdf

- Objectives

  - http://www.ieee802.org/3/cg/objectives_10SPE_111016.pdf

IEEE P802.3cg Adopted Objectives Approved by 802.3 11/10/16 (1)

1. Preserve the IEEE 802.3/Ethernet frame format at the MAC client service interface.
2. Preserve minimum and maximum frame size of the current IEEE 802.3 standard.
3. Support a speed of 10 Mb/s at the MAC/PLS service interface.
4. Do not preclude meeting FCC and CISPR EMC requirements
5. Support for optional single-pair Auto-Negotiation
6. Support optional Energy Efficient Ethernet
7. Support 10 Mb/s operation in automotive environments (e.g. EMC, temperature) over single balanced twisted-pair cabling.
8. Support 10 Mb/s operation in industrial environments (e.g. EMC, temperature) over single balanced twisted-pair cabling.
9. Do not preclude the ability to survive automotive and industrial fault conditions (e.g. shorts, over voltage, EMC, ISO16750)
10. Do not preclude working within an Intrinsically Safe device and system as defined in IEC 60079

IEEE P802.3cg Adopted Objectives Approved by 802.3 11/10/16 (2)

11. Define the performance characteristics of a link segment and a PHY to support operation over this link segment with single twisted pair supporting up to four inline connectors using balanced cabling for up to at least 15 m reach

12. Define the performance characteristics of a link segment and a PHY to support point-to-point operation over this link segment with single twisted pair supporting up to 10 inline connectors using balanced cabling for up to at least 1 km reach

13. Support fast-startup operation using predetermined configurations which enables the time from power_on**=FALSE to a state capable of transmitting and receiving valid data to be less than 100ms

14. Maintain a bit error ratio (BER) at the MAC/PLS service interface of less than or equal to 10^{-10} on link segments up to at least 15m, and 10^{-9} on link segments up to at least 1km

15. Specify one or more optional power distribution techniques for use over the 10 Mb/s single balanced twisted-pair link segments, in conjunction with 10 Mb/s single balanced twisted-pair PHYs, in the automotive and industrial environments

IEEE P802.3cg 10 Mbps Single-Pair Ethernet Potential Timeline (from last mtg)

- ✓ January 2017 – First Task Force meeting
  - Refine objectives, begin foundational work for baselines
- ✓ March 2017 – ~~Finalize objectives~~
  - March-May (**build consensus on baseline features**)
- May 2017 – baseline proposal review (Draft 0.1 skeleton produced)
- July 2017 – Draft 0.2 produced for Task Force review
- September 2017 – baselines selected, draft 1.0 for Task Force Review
- November 2017 –last technical feature introduced
  - D1.1 (Nov), D1.2 (Jan 2018), possible D1.3 (Feb 2018 extra off-cycle interim)
- March 2018 – Draft 2.0, enter working group ballot.
  - 2 recircs on WG ballot D 2.1 (May), D2.2 (July)
- Sept 2018/Nov 2018 – D3.0 – enter Sponsor ballot
  - (likely slip one meeting to November 2018)
  - D3.1 (Nov/Jan), D3.2 (Jan/Mar 2019) recirculations
- March/June 2019 Standards Board approval

IEEE P802.3cg 10 Mbps Single-Pair Ethernet Proposed Timeline (update)

- ✓ January 2017 – First Task Force meeting
  - – Refine objectives, begin foundational work for baselines
- ✓ March 2017 – ~~Finalize objectives~~
  - – ~~March-May (build consensus on baseline features)~~ – NOT AS FAR ALONG AS DESIRED
- • May 2017 – baseline proposal narrowing [CRITICAL]
- • July 2017 – Draft 0.1 (skeleton) introduced, all baselines on table [CRITICAL]
- • September 2017 – Baselines selected, draft 0.9 for Task Force Review
- • November 2017 –Last features selected - Task Force Review D1.0
  - – Nov:D1.0, Jan:D1.1, possible Feb 2018 extra off-cycle interim, D1.2 [CATCH UP POINT]
- • March 2018 – Complete Task Force Review(D1.2/1.3), tutorial for WG ballot???
- • May 2018 – Draft 2.0, enter working group ballot (2 recircs: July:D2.1, Sept:D2.2)
  - – 2 recircs: D2.1 (July) D2.2 (Sept)
- • Nov 2018 – D3.0 – enter Sponsor ballot (possible slip to Jan 2019) [SLACK]
  - – D3.0 (Nov/Jan), D3.1 (Jan/Mar 2019), D3.2 (Mar/May interim) recirculations
- • June 2019 Standards Board approval

DOWN TO 1 MEETING CYCLE SLACK, MARCH APPROVAL UNLIKELY

Presentations (Day 1)
(times are approximate and may change – even to the next day)

Title	Presenters(s)	Affiliation(s)	Approx Time
Agenda	George Zimmerman, Chair, IEEE P802.3cg Task Force	CME Consulting/(ADI, APL Group, Aquantia, BMW, Cisco, Commscope, LTC)	1:30-2:00PM
Liaison Reports: TIA TR42, ISO/IEC JTC1 SC25 WG3, ODVA	Valerie Maguire, TR42 Liaison Alan Flatman, ISO/IEC Liaison David Brandt, ODVA Liaison	Siemon Company LAN Technologies/Indep. Rockwell Automation	2:00-2:30
802.3cg Ad Hoc Report	Peter Jones	Cisco	2:30-2:45
Noise Evaluation			
Considerations and Measurements of Noise for the Industrial Link Segment	Markus Wucher	Endress+Hauser	2:45-3:05
Afternoon Break (3:00-3:30)			
Noise Measurements Update	Steffen Graber	Pepperl+Fuchs	3:35-4:05
IEEE 802.3cg STP Noise Test Setup	Bryan Moffitt	Commscope	4:05-4:30
History of the 75mV Noise Level for Long Reach Cabling	Brian Franchuk, Martin Zielinski	Emerson	4:25-4:50PM
Drive Noise Measurements	David Brandt	Rockwell Automation	4:50-5:10PM
(LIKELY END OF DAY ONE – WEDNESDAY – 5)			

Presentations (Day 2)

(times are approximate and may change – even to the next day)

Title	Presenters(s)	Affiliation(s)	Approx Time
Agenda	George Zimmerman (Chair)	CME Consulting/…	8:30-8:40
Timeline Discussion	George Zimmerman	CME Consulting, Inc	8:40-8:55
MultiDrop			
10SPE@15m multidrop and TSN	Kirsten Matheus	BMW	8:55-9:40
10SPE Automotive PHY channel consideration - time domain simulation -	Christoph Wechsler	Audi AG	9:40-10:00
Morning Break (10:00-10:30)			
Multidrop discussion	All		10:30-10:40
Link Segment and Use Cases			
802.3cg in Support of 1-pair for Premises and Data Center IOT	Masood Shariff Bryan Moffitt	Commscope	10:40-11:10
Smart Building Use Cases & Requirements	Tom Herbst		11:10-11:40
Do we need an intermediate link segment?	George Zimmerman	CME Consulting, Inc	11:40-11:55
Lunch Break (12-1:30)			
Industrial Applications Link Segment Electromagnetic Noise Environment	Chris Diminico	MC Communications/Cu-Test/PHY-SI/Panduit	1:30-2:00
Powering			
Link Segment DCR and Use Case Power Requirements	Chris Diminico	MC Communications/Panduit	2:00-2:25
DC resistance and powering scenarios	George Zimmerman	CME Consulting/ADI & LTC	2:25-2:50
Link Segment and DCR next steps discussion	All		2:50-3:00
Afternoon Break (3-3:30)			
Powering			
Long Leash PoDL	Heath Stewart	Linear Technology/ADI	3:30-3:40
Powering Next Steps discussion	All		3:40-3:50
PHY			
Block PCS discussion	Brett McClellan	Marvell	3:50-4:15
Evaluation board Update (& demonstration)	Steffen Graber	Pepperl+Fuchs	4:15-5:00

Presentations (Closing Day)

Title	Presenters(s)	Affiliation(s)	Approx Time
Agenda	George Zimmerman, Chair, IEEE P802.3cg Task Force	CME Consulting / /(ADI, Aquantia, BMW, Cisco, Commscope, LTC)	8-8:30AM
PHY Proposals and Discussion			
PAM-3 PHY Baseline Proposal	Steffen Graber	Pepperl+Fuchs	8:30-9:00
PHY next steps discussion	All		9:00-9:10
Baseline Discussions –Options and what we need to adopt (straw polls)			
Straw polls and possible motions	All		9:10-10
Morning Break (10-10:30)			
Motions : - Long Reach PHY proposals - Link Segment proposals - Multidrop PHY proposals/objectives - Powering proposals Motions on Baselines	All		10:30-12
Lunch Break (12-1:30)			
Any more motions that needed lunch for consensus building	All		1:30-1:50
The road forward– future ad hocs, champions, timelines and tracks – discussion (slides may document meeting discussion)	George Zimmerman (Chair)	CME Consulting / ADI, APL Group, Aquantia, BMW, Cisco, Commscope, LTC	1:50-2:00PM
Additional Straw Polls, Closing Business	All		2:00-2:10PM

Future Meetings

- See: http://www.ieee802.org/3/interims/index.html

- July 2017 802 Plenary
    - Berlin, Germany (Estrel)
    - July 10 – July 13 2017
- September 802.3 Interim
    - Offer by Corning in Charlotte, NC
    - Sept 11 – Sept 15 (our meeting days TBD)

- Anyone interested in hosting a interim meeting contact me or the IEEE 802.3 Executive Secretary Steve Carlson.

Thank You!