

Channel Operating Margin (COM) Code Open Source Proposal

Kent Lusted, Independent/Self

Contributors

- Rich Mellitz, Samtec
- Adam Healey, Broadcom

Background

- IEEE Std. 802.3 and amendments normatively specify Channel Operating Margin (COM) via equations and methods in Annex 93A and 178A
 - This proposal would not impact the continued normative specification of COM through equations and methods in Annex 93A and 178A
- There have been and continue to be contributions of software code implementations of these equations and methods for participants to use
 - The contributed COM software code implementation is being widely used by industry participants
- It is increasingly important to ensure that the Matlab-based “example” code implementation is revision controlled, peer reviewed, cross checked, and bug free and maintained over time
 - Specifically, the code contributed by Rich Mellitz, et. al.

Directional Support

- Much of the Q&A on the March 2024 Plenary presentation asked about the next level of details
- There was strong consensus within the P802.3dj Task Force to investigate an open source approach for the COM code

Channel Operating Margin (COM) Code as Open Source?

Kent Lusted, Intel Corporation, IEEE P802.3dj Task Force Electrical Track Chair

https://www.ieee802.org/3/dj/public/24_03/lusted_3dj_05_2403.pdf

Straw Poll #10

I would support investigating an open source approach (for example, the IEEE SA BOG Open Source Committee (IEEE OSCOM) framework) for the Channel Operating Margin (COM) code.

Results (all): Y: 68, N: 2, A: 17

https://www.ieee802.org/3/dj/public/24_03/motions_3cwdj_2403.pdf

IEEE Open Source Definitions

2 IEEE Open Source Definitions

Open Source is a digital work for which the human-readable source code is available—in the preferred form for making modifications—for use, study, re-use, modification, enhancement, and re-distribution by the users. Open Source applies to software, hardware, and other artifacts, which may include computer code, hardware designs, data, documentation, documents, and other digital objects.

Open Source Community refers to the community of individuals who are actively involved in the development, governance, or application of Open Source, whether or not they are IEEE members.

The **IEEE Open Source Platform** consists of the code and document repositories, license repositories, communication forums, Project management systems, and related administrative and end-user tools maintained by IEEE for the purpose of hosting Open Source Projects together with the associated governance mechanisms, support mechanisms, and other services offered to participants, users, and consumers of Open Source Projects.

An **IEEE Open Source Project** is a Project that is authorized to use the IEEE Open Source Platform in accordance with this Operations Manual.

Per IEEE SA OSCom Operations Manual December 20222

History of Contributions

- March 2024 Plenary
 - https://www.ieee802.org/3/dj/public/24_03/lusted_3dj_05_2403.pdf
- May 2024 Interim
 - https://www.ieee802.org/3/dj/public/24_05/lusted_3dj_03_2405.pdf
 - https://www.ieee802.org/3/minutes/may24/IEEE_802p3_WG_COM_update1.pdf
- July 2024 Plenary
 - https://www.ieee802.org/3/dj/public/24_07/lusted_3dj_08_2407.pdf
- September 2024 Interim
 - https://www.ieee802.org/3/minutes/sep24/lusted_2409_Future_of_COM_update%20WG_0p5.pdf
- Oct 2024 COM ad hoc
 - https://www.ieee802.org/3/dj/public/adhoc/COM/24_1029/lusted_3dj_COM_01_241029.pdf

Updates Since October 2024

- Clarified with IEEE SA OSCom that the existing COM code and configuration spreadsheets do not meet the requirement of “incorporated into IEEE standards” at this time
 - The COM code is not currently normatively or informatively included nor referenced as part of the text of the standard or cited in the IEEE Std. 802.3 nor amendments (e.g. 3dj).
- Therefore, COM Open Source project tier changes to a Tier 3 (from Tier 4)
 - Several OSCom Ops Manual requirements are eliminated, such as
 - “IEEE Open Source Project Lead shall be an Officer of the Standards Committee or Working Group responsible for the Project.” (Section 3.2.1)
 - “Maintainers and Committers shall be members of the Standards Committee or Working Group responsible for the Project, or affiliated with an entity member of such Working Group.” (Section 3.2.3)
 - “Maintainers for IEEE Open Source Projects incorporated into IEEE standards shall also be IEEE members of any grade and a member of IEEE SA.” (Section 3.2.3)

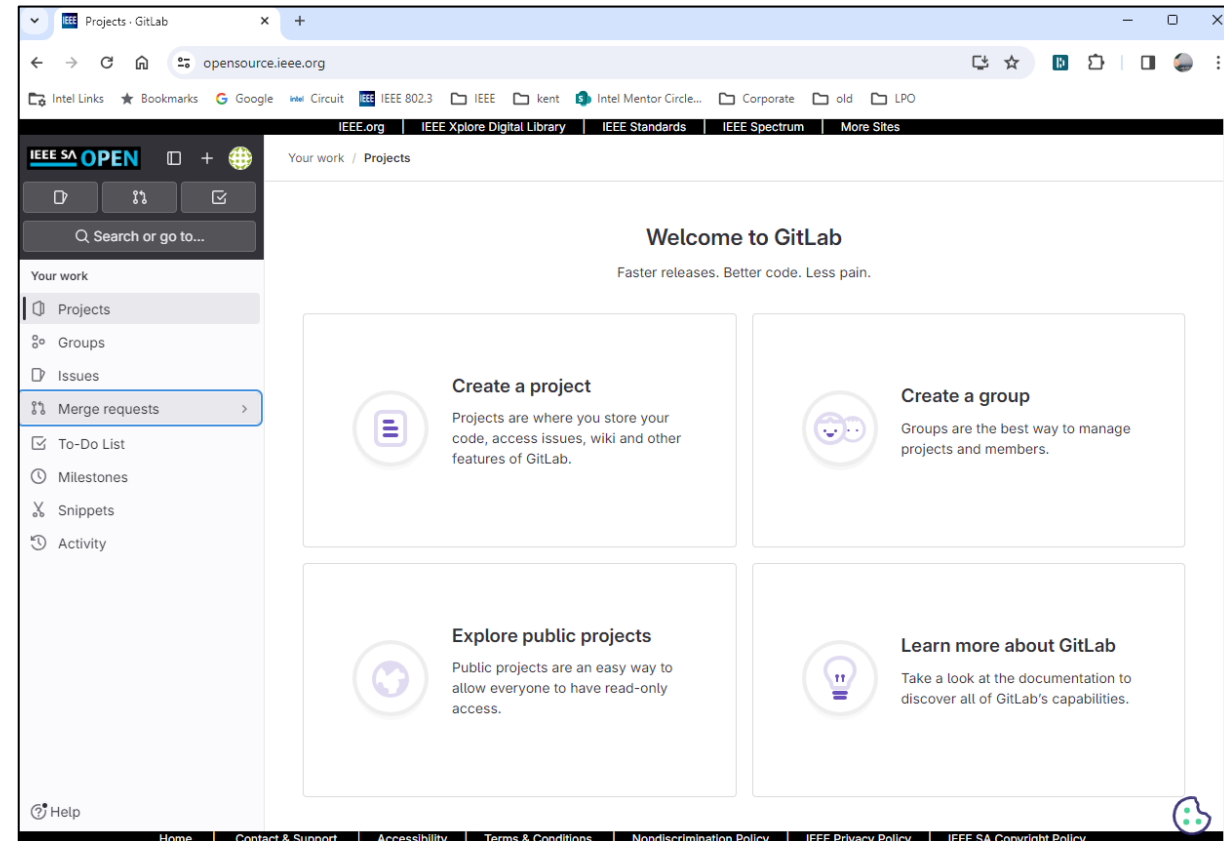
Detailed Proposal

IEEE SA Open Source Path

- Use the IEEE SA BOG Open Source Committee (IEEE OSCom) framework for the COM code and the configuration spreadsheets
 - https://standards.ieee.org/wp-content/uploads/import/documents/other/OSCOM_Operations_Manual.pdf
 - The IEEE Open Source Platform consists of the code and document repositories, license repositories, communication forums, Project management systems, and related administrative and end-user tools maintained by IEEE for the purpose of hosting Open Source Projects together with the associated governance mechanisms, support mechanisms, and other services offered to participants, users, and consumers of Open Source Projects.

IEEE SA Open Source Repository

- Hosted by GitLab
 - <https://opensource.ieee.org/>
- Free IEEE web account to access
- Full suite of tools available to manage:
 - Access and responsibilities
 - Commit or merge requests
 - Forking, branching and merging
 - Issues and problems
 - Security



Open Source Project Visibility

- Per IEEE SA OSCom maintenance manual, projects are also classified by visibility on the IEEE SA Open Source website:
 - **Private:** The Maintainer grants project access explicitly to each user. All users are Open Source Community members. The OSCom Community Manager and Platform administrators do have access.
 - **Internal:** The project can be accessed by any IEEE Open Source Community member.
 - **Public:** The project can be accessed without any authentication to view and download.

Select
Public
for COM

IEEE OSCom Project Tiers

There are five tiers of IEEE Open Source Projects:

Tier 1 — Individual Projects, which are maintained and managed by an individual who may accept contributions from others.

Tier 2 — Group Projects—Projects maintained and managed by a group of individuals or organizations. Such Projects will typically have multiple maintainer(s), committers, etc.

Tier 3 — Open Source Projects reviewed and approved for use of the IEEE Open Source Platform by OSCom to create IEEE Open Source Releases or products.

Tier 4 — IEEE Open Source Projects incorporated into IEEE standards—IEEE Open Source Projects operating in conjunction with an SASB authorized standards Project.

Tier 5 — Joint IEEE Open Source Projects—IEEE Open Source Projects that are operating in conjunction with another IEEE Board or Organizational Unit and are also subject to the policies and procedures of that Board or Organizational Unit.

https://standards.ieee.org/wp-content/uploads/import/documents/other/OSCOM_Operations_Manual.pdf

Select Tier 3
for COM

Per IEEE SA OSCom Operations Manual Clause 2, “Open Source is **incorporated** into an IEEE standard if it is normatively or informatively included as part of the text of the standard or cited in the standard.”

- Neither of these apply to the COM code at this time

IEEE SA OSCom Tier 3 Volunteer Roles & Responsibilities (1/2)

- IEEE Open Source Project Lead
 - Responsible for the vitality, organization, development, evaluation, operation, security, and maintenance of an IEEE Open Source Project.
 - The IEEE Open Source Project Lead may delegate specific responsibilities to an alternate IEEE Open Source Project Representative
- Maintainer
 - Authority to commit (save changes) to the IEEE code and document repository
 - May assign committer(s) to the repository
 - Shall be IEEE members of any grade
- Committer
 - Have the ability to commit code (save changes) to a Project

IEEE SA OSCom Tier 3 Volunteer Roles & Responsibilities (2/2)

- Contributor
 - Any person who submits any material to an IEEE open-source Project
 - All Contributors to IEEE Open Source Projects shall submit an appropriate IEEE Contributor License Agreement
 - Every Contributor is required to obtain an IEEE account that requires agreeing to the IEEE Code of Ethics and the IEEE Code of Conduct
 - IEEE membership is not required to be a Contributor
- Peer Reviewers
 - Perform a code review or evaluate the security, usability, performance, or other aspects of a planned release
- Users
 - Responsible for observing the copyright and licensing information in each open-source file

Tier 3 Project Form (1/6)



IEEE SA Open Source Committee (OSCom)

Open Source Project Request

Title: IEEE 802.3 Channel Operating Margin (COM) Tool

OS Project Lead/POC: Kent Lusted

Alternate OS Project lead: Adam Healey

OS Project Maintainer(s): Kent Lusted, Rich Mellitz

Last updated January 2023



(2/6)

PROJECT TITLE AND RELATED STANDARDS

Open source project title: IEEE Std. 802.3 Channel Operating Margin (COM) Code

Related standards project (if applicable):

- PAR number or standard number: IEEE Std. 802.3 and Amendments
- Scope statement:

- Explanation of what the standard does:

Defines Ethernet local area network operation for selected speeds of operation from 1 Mb/s to 800 Gb/s using a common media access control (MAC) specification and management information base (MIB).

(3/6)

PROJECT DESCRIPTION

What open source will be developed:

Reference software code implementations and configuration spreadsheets of the Channel Operating Margin (COM) equations and methods in IEEE Std. 802.3 and Amendments (e.g. Annex 93A and 178A). It will also provide branch support to enable participants to development new features and new capabilities for use by industry.

Why this is valuable:

The contributed COM software code implementation and configuration spreadsheets are being widely used by IEEE 802.3 participants as well as participants in other industry SDOs/SIGs (e.g. OIF)

(4/6)

RELATION TO EXISTING OPEN SOURCE

Relation to known open source:

none

Description of pre-existing open source that will be used (if any):

Not applicable

(5/6)

GOVERNANCE

Requested license (and reason):

BSD 3-clause. Requested by the contributor of the initial code commit

How will the project be governed?

By the IEEE 802.3 Working Group and will follow all applicable IEEE governance requirements including having an Open Source Lead and Maintainer per SASB and OSCom Operations Manuals

(6/6)

SUMMARY

Summary of the project and your questions for OSCom:

The contributed COM software code implementation and configuration spreadsheets are being widely used by industry participants for the development of IEEE Std. 802.3 specifications and amendments. The IEEE SA Open Source platform provides a viable platform for the development of the code in an open source manner that benefits broad industry.

Review of the formal project request: (To be completed by the OSCom Administrator.)

What's Next

Rough Next Steps

- Review and consider in TF
- Review and consider in WG
- Review with IEEE 802 LMSC
- Submit IEEE SA OSCom Tier 3 project request
- Project request is reviewed and considered by IEEE SA OSCom
- Initial code commit is provided

Summary

- The normative COM specification remains the equations and methods in Annex 93A and 178A
 - This proposal would not impact the continued normative specification of COM through equations and methods in Annex 93A and 178A
- A detailed proposal for an IEEE SA Open Source Tier 3 project for COM code and configuration spreadsheets was provided
- Seeking IEEE 802.3 WG approval to request an IEEE Open Source Project for COM code at November 2024 Plenary

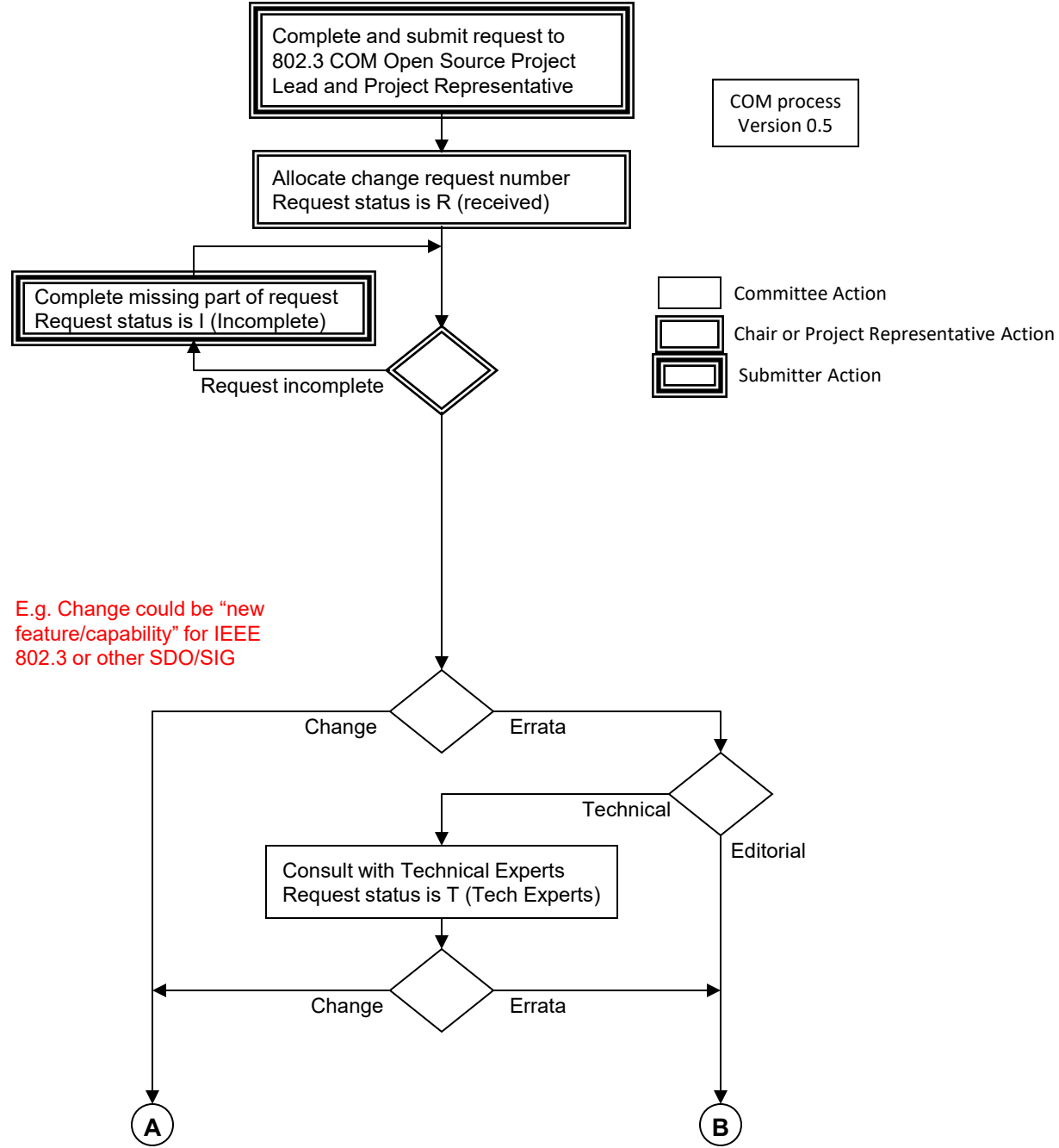
Future Work Items

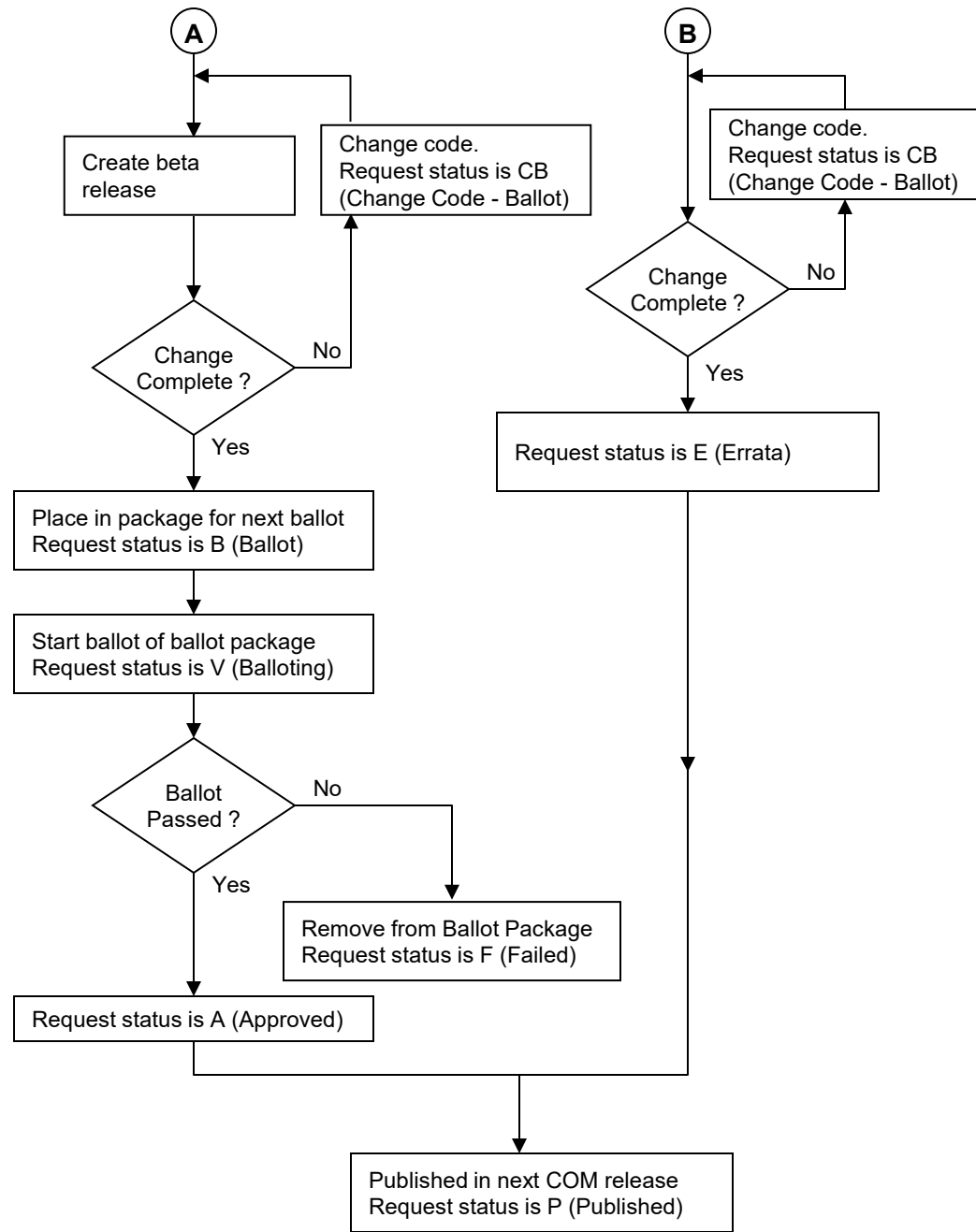
Governance Related Questions

- How Maintainers and Committers are determined, added, removed, and authorized
- Who may contribute to the project
- How merge requests are handled
- How and when releases are evaluated or reviewed
- Who decides when a release can be made.

COM Code Change Request Types

- There are three predominant types of COM changes that need to be considered
 - Maintenance - Structured
 - Corrections to existing functions or code related to IEEE 802.3 Std and amendments.
 - Stable and “proven” releases
 - Development - Fast and flexible
 - New features and new capabilities for IEEE 802.3 TF/SG use
 - Align with changes to draft specification, as the spec changes
 - Adjacencies
 - Requests for features and capabilities beyond the IEEE 802.3 Std and amendments (e.g. OIF, etc.)





Symbol	Status
A	Approved in ballot
B	Awaiting Ballot
CB	Awaiting additional change text – Ballot
CE	Awaiting additional change text – Errata
E	Errata, ballot not required
F	Failed in ballot
I	Incomplete
J	Rejected
P	Published in COM repository
R	Request received
S	Published in Errata Sheet
T	Awaiting Technical experts
V	Balloting
W	Withdrawn

Status Information Index

Thanks!

Useful References

- IEEE SA Open Source Committee (OSCom) Operations Manual
 - https://standards.ieee.org/wp-content/uploads/import/documents/other/OSCOM_Operations_Manual.pdf
- IEEE SA Open Source Committee Maintenance Manual
 - <https://opensource.ieee.org/community/manual>

Proposed *Short-term* COM Code Commit Request Dispositions (WIP)

- Managed at the Task Force level via COM ad hoc for the short-term
- Proposed short-term disposition designations for COM code commit requests were leveraged from the IEEE SA Balloting and Comment Resolution Process Guidelines
 - <https://standards.ieee.org/wp-content/uploads/import/governance/revcom/guidelines.pdf>
- Disposition Designations:
 - **Accepted:** The group agreed exactly with the commit request and change proposed by the submitter.
 - **Revised:** The group agrees with the commit request (at least in part) and implements a change that is not exactly what the submitter proposed.
 - **Rejected:** The group does not agree to make the change, or cannot come to a consensus to make changes necessary to address the commit request
 - **Deferred:** The group is unable to review or implement the commit request within the specified timeline for the next release
 - **Incomplete:** The commit request is missing details.

Proposed *Short-term* COM Code Change Management Guidelines (WIP)

- Managed at the Task Force level via COM ad hoc for the short-term
- Steps
 1. Requests for changes to the COM code are sent to Kent and Rich as a “Commit Request”
 - Brief title, submitter, description of desired change, suggested remedy
 2. Commit Requests are assigned a number associated with the COM version
 - For tracking purposes
 3. Commit Requests are introduced in the COM ad hoc
 - Details are discussed, if time allows
 - Specific code changes are provided to participants by website or reflector (TBD)
 4. Participants review the Commit Request(s) offline between the COM ad hoc meetings
 - Use of the 3dj electrical track reflector is encouraged for discussion and debate on Commit Requests
 5. A straw poll on a Commit Request is taken at a future COM ad hoc meeting to gauge support
 - If there was support, then a Commit Request becomes part of the next formal COM code release