Issue 30 • Quarter 1, 2021

Standards Quarterly Update:
What you need to know now for the future of your network

Welcome to the 30th edition of the *Standards Advisor*. This report is issued quarterly and provides updates on the standards relevant to the structured cabling industry, and the impact they have on your network design, planning and operations.

This summary represents standards meetings held during the fourth quarter of 2020 and reports on activities from all aspects of the cabling industry. These activities range from the applications standards (IEEE 802.3 and 802.11 and T11—Fiber Channel) to the cabling standards (ANSI/TIA, ISO/IEC, CENELEC). It also covers new developments in the world of multi-source agreements (MSAs).

70th ISO/IEC JTC1/SC25 WG3 Meeting, February 22-26, 2021 Virtual Meeting

Working Group 3 Meeting Highlights

The 70th ISO/IEC JTC1/SC25 Working Group 3 (WG3) meeting was attended by 68 experts and observers from 19 countries including Australia, Belgium, Canada, China, Denmark, Finland, France, Germany, Great Britain, Ireland, Israel, Japan, Mexico, Netherlands, Singapore, Spain, Sweden, Switzerland, and United States.

Working Group 3 resolved a large number of comments to the single pair content in the draft Amendments to ISO/IEC 11801-1 and ISO/IEC 11801-6. The first Working Draft (WD) of the ISO/IEC 14763-5 standard for Sustainability was reviewed, with all comments resolved, and the document will be circulated as a second WD. Comments for the third Committee Draft (CD) of the ISO/IEC 24383 Physical Network Security standard were reviewed, with the recommendation accepted to restructure the document, and a fourth CD will be circulated. There was much discussion and progress in the ISO 14763-3 optical fiber testing revision, and it was agreed to circulate a second CD for comments from national committees.

FDIS for 11801-3 amd. 1 ed. 1 Industrial; 14763-4 amd. 1 ed. 1 Measurement of End-to-End link; and 19598 amd. 1 ed. 1 AIM; will be forwarded to the Central Office for editorial comment resolution and publication. Other items were also progressed as detailed below.

1. **Development of generic single pair cabling specifications**
   Comments to the third CD of the Amendment to ISO/IEC 11801-1 were resolved and the document was approved to proceed to a fourth CD for circulation.

   · The single pair cabling Classes include:
   – Class T1-A-100, T1-A-250, T1-A-400 and T1-A-1000, specified up to 20 MHz
   – Class T1-B, specified up to 600 MHz
   – Class T1-C, specified up to 1,250 GHz

   Single pair Classes T1-A-100, T1-B and T1-C are specified to 100 m, and single pair Classes T1-A-250, T1-A-400 and T1-A-1000 are specified to 250 m, 400 m and 1000 m, respectively.

   The recognized single pair connectors are the IEC 63171-1 copper LC style connector and the IEC 63171-6 industrial connector.

2. **Single pair cable current carrying capacity**
   There was much discussion with comments concerning the current carrying capacity of the single-pair channels. A compromise was accepted to keep 2A (1.56A) as the requirement, with a footnote added that if remote powering is limited, then 0.75A can be used. A table will also be created specifying I_max/length. A liaison letter was submitted to SC 46C/WG7 with respect to the current carrying capacity of cables.

3. **Sheath sharing and single pair cabling**
   A request to initiate a NWIP for a Technical Specification covering the use of four pair cables to support single pair cabling was discussed but did not progress at this time. It was pointed out that the list of potential issues first highlighted at the Vienna meeting in 2019 should be addressed before considering standardization work in this area. The issues include concerns related to remote powering, bonding and earthing for circuits originating in different PSEs, and others.

4. **ISO/IEC 11801-6 Amendment 1, to include single pair cabling**
   Comments to the 2nd CD were resolved, and the document will be circulated as a 3rd CD. Single pair cabling specifications from the Service Consolidation Point will be aligned with the specifications in the ISO/IEC 11801-1 Amendment.

5. **Single pair multi-drop cabling**
   This technical report covers the modeling and specification of multi-drop cabling constructed from balanced 1-pair cabling components intended for use in cooperation with ISO/IEC 11801 generic cabling systems. The drafted New Work Item Proposal (NWIP) for single pair multi-drop cabling was temporarily held, and a task group was formed to continue work prior to the next WG3 meeting in September, with the focus being to prepare a more complete working draft.

6. **ISO/IEC 14763-3 Testing of Optical Fiber**
   The document contains descriptions of all tests that need to be performed for installed cabling. The standard contains details of the reference connectors used for measurement of channels and links and contains simple tables that define the measurement uncertainty for each method. Reference connectors will be extended with 24,16 and 32 fiber MPO connectors. The need for bidirectional and unidirectional testing will be discussed at the next meeting. The visual inspection requirements for cleanliness were brought in line with IEC 61300-3-35 Ed.3. A 2nd CD will be circulated.

7. **PoE Amendment to ISO/IEC 18598 Automated Infrastructure Management**
   The Final Draft Amendment (FDAM) was approved without comments.

8. **Network Physical Security (NPS)**
   Comments for the third Committee Draft (CD) of the ISO/IEC 24383 Physical Network Security standard were reviewed and will be re-circulated as a fourth CD. The ad-hoc reviewed contributions recommending significant restructuring and content changes. Content changes include the use of information sensitivity levels instead of security grades. Information sensitivity level "Open" is in principle based on minimum requirements specified by ISO/IEC 14763-2. It was agreed that a future revision/amendment of ISO/IEC 14763-2 shall include the following statement: "If a higher security grade than that which can be obtained through the specifications of this standard is required, ISO/IEC 24383 standard shall be used." In those cases where a minimum requirement is not specified by ISO/IEC 14763-2, an additional sub-clause will be added to future revision of ISO/IEC 14763-2.

9. **New Standard on Sustainability of Cabling Installations**
   The ad hoc reviewed the first Working Draft of the NWIP. The scope of this document includes requirements and recommendations to maximize the sustainability of cabling systems by addressing the cabling design, selection, packaging and transportation of components and related materials, operation and maintenance of the installation, management of waste, and related skillsets necessary for designers, installers and users. It was agreed to re-circulate as a second Working Draft for national expert comments.

The 71st ISO/IEC JTC1/SC25 WG3 meeting will be a virtual meeting to be held September 20-24, 2021.

TIA TR-42 meeting: February 1-5, 2021, Virtual meeting

Executive Summary

The following standards were approved for ballot, re-ballot, or default ballot:

- ANSI/TIA-568.5 Balanced Single Twisted-Pair Telecommunications Cabling and Components Standard
- ANSI/TIA-5071 draft standard for field testing of single pair cabling systems
- ANSI/TIA-862-C, intelligent buildings cabling revision
- ANSI/TIA-942-B-1, edge data centers
- ANSI/TIA-4966, education
- ANSI/TIA-607-D, bonding and grounding
- ANSI/TIA-606-D, administration
- TIA-5048, administration
- ANSI/TIA-568.3-E, Optical Fiber Cabling Component Standard
- ANSI/TIA-526.14-D, Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant
- ANSI/TIA-526.28, Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with MPO interfaces
- ANSI/TIA-604-10 (FOCIS 10), Fiber Optic Connector Intermateability Standard - Type LC
- ANSI/TIA-604-19 (FOCIS 19), Fiber Optic Connector Intermateability Standard - Type SEN Connector (CS Connector)
- ANSI/TIA-492AAAF, Adaption of IEC 60793-2-10:2019, Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres
- ANSI/TIA-492CAAC, Adaption of IEC 60793-2-50:2018, Optical fibres – Part 2-50: Product specifications – Sectional specification for class B singlemode fibres

The following standards were re-affirmed or approved for publication:

- TIA-TSB-5021, support for 2.5/5GBASE-T using cat 5e and 6
- ANSI/TIA-1152A, field testing
- ANSI/TIA-455-178, Adoption of IEC-60793-1-32 Optical Fibres – Part 1-32: Measurement Methods and Test Procedures – Coating Stripability
- ANSI/TIA-455-3-C (FOTP-3), Procedure to Measure Temperature Cycling Effects on Optical Fiber Units, Optical Cable, and Other Passive Fiber Components

1. TR-42.1 Commercial Building Cabling

- ANSI/TIA-568.0-E-1 amendment comments were resolved and the document was put on hold to wait for progress on dependent documents
- ANSI/TIA-758-C (OSP) Industry ballot has not been circulated yet
- ANSI/TIA-862-C, revision committee ballot comments were resolved and a 2nd industry ballot authorized
- ANSI/TIA-942-B-1, edge data centers Comments were resolved, four 'levels' reduced to 2, other changes successful, 2nd committee ballot was authorized
- ANSI/TIA-4966, education standard was reviewed with changes, 2nd industry ballot was authorized
- Several documents under 42.1 control are nearing their due dates for maintenance, and will be reviewed in June

2. TR-42.3 Pathways and Space

- 607-D-1 for bonding and grounding was reviewed,, with changes to harmonize with ANSI.TIA-222 from TR-14, and an industry ballot will be circulated
- ISO/IEC 18598 AMD 1 for AIM was reviewed and agreed, and a ballot for adopting it as an addendum to TIA-5048 will be circulated
- ANSI/TIA-606-D was reviewed and will be circulated as an industry ballot

3. TR-42.5 Telecommunications Infrastructure Terms and Symbols

- The following definitions were reviewed or modified
  - adapter: A device that enables any or all of the following: (1) different sizes or types of plugs to mate with one another or to fit into a telecommunications outlet, (2) the rearrangement of leads, (3) large cables with numerous conductors to fan out into smaller groups of conductors, (4) interconnection between cables. (568)

4. TR42.7 Copper Cabling Systems

- TR42.7 completed comment resolutions for the ballot of ANSI/TIA-568.5, single pair cabling and components standard. Another industry ballot reflecting these changes was authorized
- TR42.7 resolved comments for the ANSI/TIA 5071 draft standard for field testing of single pair cabling systems and authorized a industry ballot
- A task group continues to study the far end grounding issue for TCL. The study will clarify the dependency of a single pair channel on the grounding of the far end. Test samples are needed for round robin testing planned. This TG work is being delayed by the virus
- A task group report on thermal performance of single-pair cables continues to work
- A PAR for a new TSB for power delivery using single-pair was approved
- ANSI/TIA-1152A, field testing, was agreed to be re-affirmed and a ballot will be circulated
- TIA-TSB-5021 for the use of installed Category 5e and 6 to support 2.5GBASE-T and 5GBASE-T was re-affirmed
- ANSI/TIA-568.6 Single-pair multi-drop received no new contributions and we hope for contributions at the June meeting

5. TIA TR42.9 Industrial Cabling

- TR42.9 resolved committee ballot comments on ANSI/TIA-1005-B, revision of A, and the document has been put on hold pending further progress on ANSI/TIA-568.7
- ANSI/TIA-568.7 for balanced single twisted-pair for industrial premises: an outline with limited content was reviewed and instructions were given to the editor, and two meetings will be held in the interim for draft development on March 24 and April 29

6. TR-42.11 Optical Fiber Systems

- ANSI/TIA-PN-568.3-E, Revision of ANSI/TIA-568.3-D, *Optical Fiber Cabling Component Standard*
  - Comment resolution was completed and draft document with accepted comments will be submitted for 2nd ANSI ballot.
  - Significant technical changes since last ballot include:
    - 953nm minimum EMB specifications for OM3 and OM4 will be added to document as informative guidance.
    - Individual fiber colors for array cords are added to document.
    - "OS1" cable designations are removed for Indoor-Outdoor and Outside Plant fiber type, as the maximum attenuations do not meet the OS1 requirement.
- ANSI/TIA-PN-526.14-D, Revision of ANSI/TIA-526-14-C, Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant. Draft document was approved and submitted for 1st ANSI ballot.
- ANSI/TIA-PN-526.28, Adoption of IEC 61280-4-5:2020, Attenuation measurement of MPO terminated fibre optic cabling plant using test equipment with MPO interfaces. Document was approved and submitted for 1st ANSI ballot.
- New Project - ANSI/TIA-526-7-A, Adoption of IEC 61280-4-2 ed. 2, Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant. Approved to reaffirm for ANSI 5-year maintenance.

7. TR-42.12 Optical Fiber and Cable

- ANSI/TIA-455-178 (FOPT-178), Adoption of IEC-60793-1-32:2018 Optical Fibres – Part 1-32: Measurement Methods and Test Procedures – Coating Stripability. Document was approved for publication.
- ANSI/TIA-455-3-C (FOTP-3), Revision of TIA-455-3B, Procedure to Measure Temperature Cycling Effects on Optical Fiber Units, Optical Cable, and Other Passive Fiber Components. Document was approved for publication.
- ANSI/TIA-PN-598-E, Revision of ANSI/TIA-598-D, Optical Fiber Cable Color Coding
  - Munsell book measurement results were presented and will be incorporated into the overall data set.
  - Interim meeting is planned for round robin measurements on golden sample color chips.
- TIA-492 Series Restructuring
  - ANSI/TIA-492000, Adaption of IEC 60793-2:2019. Document has been published. However, a new project is needed to update TIA-492 fiber cross reference naming convention.
  - ANSI/TIA-492AAAF, Adaption of IEC 60793-2-10:2019. New project opened to update TIA-492 fiber cross reference naming convention. Document with the updates was approved and will be submitted for ANSI ballot.
  - ANSI/TIA-492CAAC, Adaption of IEC 60793-2-50:2018. New project opened to update TIA-492 fiber cross reference naming convention. Document with the updates was approved and will be submitted for ANSI ballot.
- New Projects
  - ANSI/TIA-PN-455-111-B (FOTP-111): Committee approved to open a project to adopt IEC 60793-1-34:2021, Measurement Methods and Test Procedures – Fibre Curl.
  - ANSI/TIA-PN-455-133-B (FOTP-133): Committee approved to open a project to adopt IEC 60793-1-22:2001, Optical fibres – Part 1-22 Measurement Methods and Test Procedures – Length Measurement.
  - ANSI/TIA-PN-455-203-B (FOTP-203): Committee approved to open a project to adopt IEC 61280-1-4:2009, Fibre Optic Communication Subsystem Test Procedures – Part 1-4: General Communication Subsystems (Light Source Encircled Flux Measurement Method.

- ANSI/TIA-PN-455-204-B (FOTP-204): Committee approved to open a project to adopt IEC 60793-1-41:2010, Optical fibres – Part 1-41: Measurement Methods and Test Procedures – Bandwidth
- Recession/Obsolete Documents
  - FOTP-30, Frequency Domain Measurement of Multimode Optical Fiber Information Transmission Capacity. Liaison letter(s) to referencing organizations (including IEEE) will be approved at next meeting. Letter(s) will announce the withdrawal and suggest a replacement.
  - FOTP-54, Mode Scrambler Requirements for Overfilled Launching Conditions to Multimode Fibers. Liaison letter(s) to referencing organizations (including IEEE) will be approved at next meeting. Letter(s) will announce the withdrawal and suggest a replacement
  - FOTP-124, Polarization-Mode Dispersion Measurement for Single-mode Optical Fibers by Interferometry. Cross references will be reviewed at the next meeting.

8. TR-42.13 Optical Passive Devices and Metrology

- ANSI/TIA-PN-604-19 (FOCIS 19), Fiber Optic Connector Intermateability Standard - Type SEN Connector (aka. CS connector)
  - In May 2020 meeting, an APC variant in which the left and right ferrule end face angle slopes are in opposite directions was presented. There is a pending patent application on that design and agreement has been made to submit a patent holder statement, such that a license will be made available under RAND terms if such IP is issued with essential claims necessary for the practice of normative portions of FOCIS 19.
  - Document with comment resolutions incorporated will proceed to ANSI/TIA ballot.
- ANSI/TIA-PN-604-10 (FOCIS 10), Fiber Optic Connector Intermateability Standard - Type LC
  - There was objection on the standardization of a single quadraplex adapter type, due to existing dual-duplex products on the market with undefined pitch (between the duplex pairs).The concern was there is a potential for incompatibility with LC connectors in the field. However, majority of the committee voted in favor of moving forward with the standardization of one quadruplex adapter variant based on a 6.25 mm pitch between adjacent channels. Document with comment resolutions incorporated will proceed to ANSI/TIA ballot.

The next scheduled meeting of TIA TR-42 will be a virtual meeting to be held June 14-18, 2021.

CENELEC TC86BXA meeting: No meetings were held during Q1, 2021

The next scheduled meeting of CLC TC86BXA will be a virtual meeting to be held June, 2021.

IEEE 802.3 Ethernet meetings: Interim Meeting—January 18-28 and Plenary Meeting March 5-18, 2021, Virtual meetings Interim Task Force Meetings from December 15, 2020 – March 27, 2021

Due to COVID-19, IEEE 802 and IEEE 802.3 continue to hold telephonic meetings in place of the scheduled face-to-face meetings. This is expected to continue until at least September 2021, and possibly into 2022.

1. IEEE 802.3cv Maintenance on 4 pair Power over Ethernet (PoE)

- This task force is cleaning up minor issues found in initial testing of the 802.3bt standard for 4 pair PoE. The modifications do not change the functionality and are not expected to present interoperability or compliance issues.
- The Task Force has completed its work and the draft has been forwarded to REVCOM and the IEEE Standards Board for approval.

Single-twisted-pair copper standards

2. IEEE P802.3da Single Pair Multidrop Segments Enhancement Task Force

- This project is developing extensions to the Clause 147 10BASE-T1S multidrop (10 Mbps shared media) PHY defined in 802.3cg, interoperable with the PHY in 802.3cg. The major objectives the project is working on include the following (for more objectives, see objectives on the IEEE 802.3da site):
  - 1. Adding interoperable multidrop power over Ethernet and reach extensions for multidrop to better accommodate building automation.
  - 2. Extending multidrop networks to support at least 16 nodes and 50m of reach (32 nodes and 70m are desired, but the objective is only 16 nodes and 50m)
  - 3. Defining plug-and-play multidrop powering, and
  - 4. Selecting a single equipment connector.

  - Task Force is in the process of adopting specifications for the initial Task Force Review. A second interim drafts (0.2), reflecting agreements to date (0.2) was shared with the Task Force in January, including an adoption of a multidrop-focused new clause based largely on IEEE 802.3cg 10BASE-T1S Clause 147.
  - Primary work focuses on 3 areas: (1) defining the electrical parameters for the shared-media 'mixing segment' – wiring that connects the various multidrop nodes; (2) defining a protocol for automatically configuring the node ID's associated with the (IEEE 802.3cg) Clause 148 Physical Layer Collision Avoidance (PLCA) protocol; and (3) defining the parameters, startup, and power levels associated with powering a multidrop segment.
  - The most difficult work is related to refining the specification of the mixing segment, enabling greater reach and an increased number of nodes. The group is forming consensus around an LT Spice model of the mixing segment which needs to be translated into deployment rules.
- The Task Force has indicated it intends to be communicating its work with TIA TR42.7 so that the two can produce aligned specifications for multidrop single-pair use in commercial building.
- The Task Force adopted a formal timeline resulting in a standard in mid 2023.

3. IEEE P802.3cy Greater than 10 Gb/s Electrical Automotive Ethernet Task Force

- This project is developing new electrical (as opposed to optical) PHY specification for 25Gb/s, 50Gb/s, and 100Gb/s Ethernet, at distances of up to 11m, suitable for automotive use. It is primarily driven by requirements for autonomous vehicle networking, and the project scope includes both symmetric and asymmetric transmission (where one of the directions is at a much lower speed).
- The project is focused on channels with shielded differential pair cabling suitable for automotive use, with 8 GHz bandwidth. Both twisted pair or parallel pair constructions are considered. Because it is required to operate in an automotive environment, this cabling differs from existing twinax data center cabling.
- The group adopted a baseline to use multiple pairs to expand from 25Gb/s on a pair to 50 Gb/s on two pairs, and 100 Gb/s on four, all at a distance of up to 11m.
- The project adopted a formal timeline which results in a completed standard in Q3 2023.
- While motivated by automotive applications, the standard does not limit the application of the PHY and may find use in short-range high-speed applications on shielded balanced pair cabling which could be used as an alternative to direct-attach twinaxial cables.

4. IEEE P802.3dd Maintenance #17: Power over Data Lines of Single Pair Ethernet

- In March 2021, the IEEE-SA standards board approved this new project to implement editorial and technical corrections in the Clause 104 Power over Data Lines (PoDL) of Single Pair Ethernet. This project will modify the specifications introduced by IEEE 802.3bu and IEEE 802.3cg to address a number of technical and editorial issues found during the implementation of single-pair Ethernet powering using classification.
- Specifically, initial implementations for automotive applications did not use the classification functionality, and the interest and implementation of single-pair powering for in-building applications uncovered a number of specifications requiring minor modification.
- As a maintenance project, no new features (e.g., powering levels) may be added.
- The project is expected to have its first electronic meeting in April 2021 and is expected to take 18 months to produce an amendment.

5. IEEE 802.3 Enhancements to point-to-point Single Pair Ethernet Study Group

- At the March 2021 IEEE 802.3 Plenary, a new study group was approved to develop Project Authorization Requests (PAR) and Criteria for Standards Development (CSD) responses for Enhancements to point-to-point Single Pair Ethernet to: (1) Support TSN, and (2) Support increasing traffic and speed needs with long reach point-to-point higher-speed single-pair PHYs
- This new study group is expected to produce two project requests, one quick, and the other representing a longer-term enhancement for single pair ethernet in buildings.
- The first is a near-term project to permit use of the new point-to-point 10 Mb/s Single Pair Ethernet PHYs (10BASE-T1L and 10BASE-T1S) specified by IEEE 802.3cg with the 802.3 specifications used for Time Sensitive Networking. This is expected to be a quick project without any functional changes.
- The second focus is to begin work on the next speed enhancement for building automation and industrial automation distances with point-to-point single pair Ethernet. The existing 100Mb/s and faster single pair PHYs are primarily specified for automotive distances and environments, and this project would look to specify at least one long-reach PHY (likely at 100 Mb/s) for greater than 100m distance.
- The study group is expected to have its first electronic meeting in April 2021.

Optical Fiber Standards

6. IEEE P802.3cp 10G, 25G, and 50G bidirectional access optical PHYs Task Force

- This Task Force is developing standards for bidirectional 10G, 25G, and 50G over 10, 20, and 40 km over a single strand of singlemode fiber.
- Draft 3.0 was reviewed by the Standards Association.
- Draft 3.1 will be reviewed by the Standards Association.

7. IEEE P802.3cs Central office consolidation (super PON) Task Force

- The main objectives of this Study Group are:
  - Support a passive point-to-multipoint ODN with a reach of at least 50 km with at least 1:64 split ratio per wavelength pair
  - Support at least 16 wavelength pairs for point-to-multipoint PON operation
  - Support the MAC data rate of 10Gb/s downstream
  - Support the MAC data rates of 2.5Gb/s and 10Gb/s upstream
  - Support tunable transmitters
- Draft 2.0 was prepared for Working Group review.

8. IEEE P802.3ct 100 Gb/s and 400 Gb/s Operation over DWDM Systems Task Force

- This project was split into P802.3ct for the 100G objective and P802.3cw for the 400G objective.
- The main objective is:
  - 100 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (100GBASE-ZR).
- DP-DQPSK coherent modulation format will be used for 100GBASE-ZR
- The Task Force resolved comments from the Standards Association on Draft 3.1.
- Draft 3.2 will be generated for Standards Association Ballot.

9. **IEEE P802.3cu 100 Gb/s and 400 Gb/s over SMF at 100 Gb/s per Wavelength Task Force**

- This Task Force has the following objectives:
  - Define a single-wavelength 100 Gb/s PHY for operation over SMF with lengths up to at least 2 km and up to at least 10 km
  - Define a four-wavelength 400 Gb/s PHY for operation over SMF with lengths up to at least 2 km and up to at least 6 km
- The Task Force has reviewed comments from the Standards Association against Draft 3.2.
- Draft was submitted to RevCom and approved as a new standard (IEEE Std 802.3cu-2021).

10. **IEEE P802.3cw 400 Gb/s Operation over DWDM Systems Task Force**

- This project was split from P802.3ct for the 400G objective.
- The main objective is:
  - 400 Gb/s operation on a single wavelength capable of at least 80 km over a DWDM system (400GBASE-ZR).
- DP-16QAM coherent modulation format will be used for 400GBASE-ZR
- Baseline proposals are being considered.

11. **IEEE P802.3cz Multi-Gigabit Optical Automotive Ethernet Task Force**

- This project will define the performance characteristics of an automotive link segment and an optical PHY to support 2.5, 5, 10, 25, and 50 Gb/s over 40 m of automotive cabling.
- Task Force resolved comments against Draft 1.0.
- Draft 1.1 will be generated for Task Force review.

The next scheduled Interim meeting of IEEE 802.3 will be a virtual meeting to be held May 17-27, 2021

IEEE 802.3 Task Force electronic Interims are expected to continue to be called weekly as needed through July 2021.

OIF Standards meeting: February 22-26, 2021, Virtual meeting

1. **Common Electrical Interface – 224G Development Project (CEI-224G)**

- This project will develop a body of knowledge summarized into a white paper that will enable new project launches for specific next generation 224 Gbps clauses.
- PAM4, PAM6, and PAM8 modulation formats are being considered.

2. **Co-Packaging Framework Project**

- The Co-Packaging Framework IA is an umbrella project that will study the application spaces and relevant technology considerations for co-packaging of communication interfaces with one or more ASICs.
- Project was launched at the November meeting.

3. **Implementation Agreement for a 3.2Tb/s Co-Packaged Optical (CPO) Transceiver**

- This Implementation Agreement specifies key aspects and electo-optical-mechanical details of a 3.2Tb/s Co-Packaged Optical Module.
- This project will draw on 400G-FR4 and 400G-DR4 IEEE standards as well as the CPO JDF.
- Project was launched at the February meeting.

The next meeting of OIF Standards will be held in May, 2021, Virtual meeting.

INCITS Fiber Channel T11.2: February 2-4, 2021, Virtual meeting

1. **FC-PI-7P (256GFC Parallel 4x64GFC**

- This document is now published.

2. **FC-PI-8 (128GFC Serial)**

- June 2021 Target Completion Date
- T11-2021-00035-v1: There was continued discussion on the need/value of optical link training. Earlier discussions suggested that optical link training was not needed to improve link performance. However, recent simulations showed that optical link training could be used to optimize performance, by tuning with different lengths of optical fiber. Simulations also showed a path to TDECQ with optical link training.
- Further discussions ensued on Chip to module training, such as replacing electrical link training with optical link training. Transmission specs will be looser but optical link training will yield improvement over longer lengths. Different use cases suggest that optical chip to module training cannot always be performed.
- Currently IEEE has not considered optical or electrical training in their specification, so FC is opting to follow IEEE and not pursue optical training. However, no consensus on training was reached. This discussion is to continue at next meeting.

3. **FC-FS-6 Updates – (T11-2020-0210-v4)**

- Letter Ballot targeted for October 2021
- Required changes to Lane Speed Negotiation identified and are to be referenced in FC-FS-6. Information for 128GFC and PI-8 stability is also required before FS-6 can be completed.

4. **Discussion on 50m vs 100m reach for MMF**

- FCIA continue to monitor activity of IEEE 802.3dB Task Force on 100G Short Reach
- IEEE Task Force now considering interoperability of 50m and 100m reach. 50m reach is more appealing but more specifications have yet to be determined. 100m reach is approved (at 850nm) but with lesser votes than 50m. Lingering concerns are 1.) The cost of 100m reach systems, and 2.) Burdening 50m reach systems with the specs of 100m reach systems to meet interoperability.

The next meeting of INCITS T11 will be held April 6-8, 2021, Virtual meeting.

IEC SC86B meeting: No meetings were held during Q1, 2021

The next meeting of IEC SC86B will be held in April, 2021, Virtual meeting.

IEC SC86C WG1 meeting: No meetings were held during Q1 2021

The next meeting of IEC SC86C WG1 will be held April 4-12, Virtual meeting.

ITU-T SG15 WP2 meeting: Interim meeting held in Q1, 2021

SG15Q6: Characteristics of optical components, subsystems and systems for optical transport networks

Documents in progress:

- Draft new Recommendation L.oehc "Optical/Electrical hybrid cables for access point and other terminal equipment" was reviewed. Decision made to remove the detailed connector and cable descriptions as this work should be covered by IEC SC48B and IEC SC86A. Move the specific design of cable and connector to an informative appendix "Chinese experience".
- A draft of the revised ITU-T Recommendation L.201/L.13 "Performance requirements for passive optical nodes: Sealed closures for outdoor environments" was reviewed. A new clause 5.3 for closure materials was added. A humidity resistance requirement is added for the ageing effects by humidity of the polymers used in the closure. For the impact test the impact location is described for rectangular shaped closures. The document is planned for consent at the next ITU-T SC15 meeting in April.
- A draft of the revised ITU-T Recommendation L.400/L.12 "Optical fibre splices" was reviewed. The attenuation characteristics will depend on the used alignment method of the fibers: active core alignment, active cladding alignment and passive V-groove alignment. An appendix is added to show the effects of mode field diameter mismatch and core concentricity when splicing different fibers types. Another appendix is added to explain the fiber imaging process in fusion splicing machines. The document is planned for consent at the next ITU-T SC15 meeting in April.
- A draft of the revised ITU-T Recommendation L.ncip "Requirements for Passive Optical Nodes: nodes for customer indoor premises" was reviewed. This new recommendation describes the requirements for optical wall outlets in customer premises. Also a small housing that can be used for extension of cables or repair of cables will be included.

The next meeting of IITU-T SG15 is scheduled for April 12-23, 2021, Virtual Meeting.

IEC SC48B meeting: March 15-18, 2021, Virtual meeting

- A 2nd ED project for IEC 63171 parent document will be started as there are several technical improvements that need to be incorporated.
- 2nd ED projects are also underway for 63171-1 and -6 variants.
- Work continued on 2nd ED of IEC 60512-99-002 un-mating under load test standard to align the test sequence to be the same as that published in IEC 60512-99-01 while enabling testing up to 2 A per contact needed for IEEE 802.3bt 4PPoE sourcing 90 watts PoE power per channel.
- It was proposed that a new project be launched to create IEC 60512-99-003 to support IEC 63171-X connectors for endurance test – Test99c schedule.

The next meeting of IEC SC48B is scheduled for the week of September 12th, Berlin, Germany or Virtual meeting.

Liaison letter from IEC JTC1/SC25 - The liaison letter "3N1277_INF_Liaison-to-SC46C-WG7" dealt with two aspects, Single Pair Cabling and Remote Powering. With respect to Single Pair Cabling the status of the development of the Amendment 1 to ISO/IEC 11801-1 is described as far as it concerns the development of the respective cable standards IEC 61156-11 to -14. This information will be used for the development of the drafts for the projects discussed under 6.5 to 6.8 (first CD of the revision of IEC 61156-11; next CD of IEC 61156-13).

With respect to Remote Powering the question the liaison letter requested guidance on the maximum current carrying capacity and comment on the feasibility of a requirement for a minimum current carrying capacity of 2 A DC continuous current per conductor at 60°C. The discussion led to the following points:

- As the maximum operating temperature of structured cabling is limited by ISO/IEC 11801-1 to 60°C, it needs to be assumed that the environment has lower temperature to have room for an inevitable temperature increase due to remote powering. Typically, the assumption is an environment temperature of 50°C maximum and a temperature increase of 10°C maximum.
- The temperature increase of conductors with remote powering is strongly dependent on the DC resistance of the conductor and the installation conditions of the cable the conductor is located in. The technical specification ISO/IEC TS 29125 provides guidance on effects of these parameters which is indicating that a general answer to the question raised in the liaison letter is not possible. Further investigations and a revision of this technical specification which currently is limited to 1 A maximum, is recommended to extend the range guidance is provided to the requested limits. A simple figure in A or A/mm² is not reflecting the complexity of the practice.

A second liaison letter "3N1276_INF_Liaison-to-TC46" dealt with the relation between unbalance attenuation and coupling attenuation. The discussion – partly under 6.5 and 6.7 – indicated the following points:

- The liaison letter is directed to TC46/WG5 and should mainly be discussed in the next meeting of WG5.
- The difference between coupling attenuation and low frequency coupling attenuation is widely unclear. Further standards developments need to be very precise in this point and need to give respective guidance to the user.

The chairs of SC46C and TC46 and convenors of WG5 and WG7 shall draft a respective liaison response. This will be available for two weeks on the collaboration tool for comments by the experts before sending.

IEC 61156-1 ed4 - A contribution was presented highlighting the question of the termination resistor network to be used for balun based measurements (termination resistor network in 61156-1Ed4). This has been discussed and it was concluded that the 2nd CD can be circulated with the figures as available.

A first CD of the next edition of IEC/TR 61156-1-2 is available. It was discussed that the scope needs to be updated and a respective proposal is already available. The draft can then be circulated.

IEC TR 61156-1-3/AMD1 ED1 - A separate meeting to discuss the comments on the latest CD was held on December 7. The respective CC needs to be circulated as soon as possible. A next CD shall be prepared by the end of March.

It was discovered that the triaxial method that was introduced in the coupling attenuation measurement methods of IEC 61156-5, IEC 61156-6, IEC 61156-9 and IEC 61156-10 is missing from IEC 61156-7 and IEC 61156-8. It is therefore proposed to amend them in order to add that method. A questionnaire needs to be circulated to ask the NC's for permission to prepare an amendment.

IEC 61156-11 (1p, 600 MHz, installation cable) - It has been decided to start a revision of IEC 61156-11 to include cable in support of T1-C type cables up to 1250 MHz (Decisions D20-10). An available draft has been shown that could be circulated. Then the requirements of the current draft amendment to ISO/IEC 11801-1 have been discussed and it was concluded that:

- The requirements at frequencies between 100 kHz and 1 MHz should be included but marked ffs in case they are not appropriate.
- Low frequency coupling attenuation (LFCA) shall be added in a separate table for the frequency range of 100 kHz to 30 MHz. As there is very limited experience with LFCA the values shall be ffs.

A 1st CD of IEC 61156-11 ed2 shall will be prepared by the end of March.

IEC 61156-12 (1p, 600 MHz, work area cable) - The first edition of IEC 61156-12 has been published. It was already discussed during the SC46C plenary meeting on November 5 to start a revision of IEC 61156-12 to include cable in support of T1-C type cables. This revision will be started as soon as the current project for the revision of IEC 61156-11 has sufficient maturity.

IEC 61156-13 (1p, 20 MHz, installation cable) - Comments on the last CD have been resolved and a CC was circulated (46C/1164/CD, 46C/1178/CC). Based on the discussions under 5.1 and 6.5 a further CD shall be prepared considering the following:

- LFCA to be added with values according to comment CH05 marked with ffs.
- A further draft (CD4) of the amendment to ISO/IEC 11801-1 will be circulated soon. This document shall be taken into consideration.
- A definition of LFCA and guidance of the difference between LFCA and Coupling Attenuation shall be added. Coupling Attenuation is a parameter defined for electrically long set-ups meaning it is defined at high frequencies. Probably it should be called High Frequency Coupling Attenuation to better separate from LFCA.

4th CD of IEC 61156-13 ed1 shall be prepared until end of March.

IEC 61156-1-14 (1p, 20 MHz, work area cable) - The project will be started as soon as IEC 61156-13 has reached a reasonable level of maturity.

IEC 61156-15 (cable with resistance to fire) - Based on 46C/1177/RVN a 1st draft is available to be circulated. It has been reviewed. Some editorial changes will be implemented. Then is can be circulated.

The next meeting of IEC JTC1/SC25 is scheduled for September 9, 2021, Virtual meeting.

COMMSCOPE®

commscope.com

Visit our website or contact your local CommScope representative for more information.

CO-115612-EN (04/21)