IEEE 802.3 Ethernet Working Group
LMSC REVIEW DRAFT Liaison Communication

Source:	IEEE 802.3 Working Group[1]	
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From:	David Law	Chair, IEEE 802.3 Ethernet Working Group
Subject:	Response to ITU-T SG15, SG15-LS9, LS/I on information on new work items on weakly-coupled multi-core fibre (WC-MCF) standards in Q5/15	
Approval	Agreed at IEEE 802.3 Interim meeting, New Orleans, LA, USA, 15 May 2025	

Dear Mr Parsons and members of ITU-T Study Group 15,

The IEEE 802.3 Working Group would like to thank you for your recent liaison regarding the two work items and the draft of G Suppl.G.65x.

[1] This document solely represents the views of the IEEE 802.3 Working Group and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

IEEE 802.3 appreciates ITU-T Q5/15's interest in identifying the applicability of WC-MCF technology to short-reach and data centre networks. Currently, there are no IEEE 802.3 projects or study group efforts targeting WC-MCF. However, the IEEE 802.3 NEA "Ethernet for AI" assessment recently heard a technical presentation on this fibre type (see https://www.ieee802.org/3/ad_hoc/E4AI/public/25_0327/yu_e4ai_01_250327.pdf), which was also reviewed by the P802.3dj Task Force (see https://www.ieee802.org/3/dj/public/25_05/yu_3dj_01_2505.pdf) while preparing a response to your liaison.

At this time, given that IEEE 802.3 has no projects or study groups to draw upon, the Working Group has no basis to which it can point that highlight market interest. Our experts, however, did note that there has been significant discussion of this fibre type at recent conferences, such as the Optical Fiber Communications Conference and Exhibition (OFC).

IEEE 802.3 agrees with Q5/15 on the need for continuous harmonized discussions between our two groups. Based on the observed industry interest in 400 Gb/s electrical and optical signalling, as currently being explored in our "Ethernet for AI" assessment, once market demand is identified, it will be imperative for organizations to be able to respond in a rapid fashion.

As the ITU-T considers WC-MCF going forward, IEEE 802.3 would like to share our initial thoughts.

IEEE 802.3 PHY specifications reference industry fibre specifications and specify channels which are derived from them, including connector and cable considerations. Our interface specifications are based on link methodologies that consider the various impairments that would affect link performance.

When looking to incorporate a new WC-MCF fibre specification, we would review parameters that might deviate from current G.652/7 fibre specifications and whether new parameters might exist that would affect the definition of any new interface specifications. Initial conversations identified these areas of interest:

- Any changes to the Polarization Mode Dispersion (PMD)/Differential Group Delay (DGD) or chromatic dispersion specifications? At the anticipated signalling speeds of some upcoming projects, these parameters can be impactful even over shorter reaches.
- Any changes to the loss specifications?
- Consideration of typical installation approaches for these short-reach links in a data centre environment where high-density cables are used, and bend sensitivity becomes a consideration for any of the fibre parameters.
- Consideration of whether fan-in/fan-out fibre transitions affect any of the fibre parameters.
- Definition of insertion loss of connectors and fibre splices.
- Definition of return loss at connectors.
- Definition of crosstalk parameters that could occur at connectors or within the fibre between cores (co-propagating and / or counter-propagating), as applicable.
- What wavelength bands will the fibre support?
- Will there be any constraints with the maximum optical power that a fibre will support?
- Will this fibre support the use of amplification?
- Consideration of multi-path interference impairments that arise from the connectors or fibre bending.
- Field testing and validation of these parameters over typical installations consistent with short-reach cables.
- Considerations of economic feasibility of these solutions.

The typical reaches of SMF optical interfaces that IEEE 802.3 define are 500 m, 2 km, 10 km, 20 km, and 40 km. If reach affects any of these parameters due to statistical considerations, this would also be something we would need to consider.

We look forward to continuing conversations on this topic.

Sincerely,
David Law
Chair, IEEE 802.3 Ethernet Working Group