Meeting Report to TC86 Plenary

IEC SC86C　Fibre Optic Systems, Sensing and Active Devices

(New title to be approved at TC86 Plenary)

Mr. Haruo Okamura,
Chair

Mr. Fred Heismann
Secretary

Mr. Goldstein Seymour,
Ms. Elaina Finger
Assistant Secretary

November, 04, 2024,
Queretaro, Mexico

SC 86C P-Members and O-Members 2024

24 P - Members

Austria	Greece
Belgium	Iran
Canada	Italy
Switzerland	Japan
China	Korea, Republic of
Germany	Netherlands
Denmark	Norway
Algeria	Poland
Spain	Russian Federation
Finland	Sweden
France	Slovakia
United Kingdom	United States of America

17 O - Members

Australia	Pakistan
Bulgaria	Portugal
Czech Republic	Romania
Hungary	Serbia
Ireland	Thailand
Israel	Türkiye
India	Ukraine
Mexico	South Africa
New Zealand	

- **Iran (IR) transitioned from O-member to P-member**
- **Pakistan (PK) transitioned from P-member to O-member**

Chairman's Farewell Remarks

I thank the Mexico National Committee for hosting this year's TC 86 meetings in Queretaro. I also express my gratitude to the experts of the four Working Groups for their achievements during the past year.

Nobel Prize in Physics and in Chemistry, given to AI technology and AI applications, highlight the profound impact of the AI revolution in communities with the Internet. However, the 2.6 Billion people who do not yet have access to the Internet will be left far behind.

AI will accelerate digital divide, economic disparities, and induce risks such as refugee crises, terrorism, pandemics, and even nuclear threats such as a high-altitude nuclear EMP attack. Such concerns might be why the 2024 Nobel Peace Prize focuses on nuclear disarmament.

In the previous FOCI meetings, I discussed my efforts to have developed and standardized the optical cable solution to connect the unconnected. In Milan, I also touched upon the high-altitude EMP threats over fiber sensors, amplifiers, active devices and dynamic modules.

As part of IEC SMB's strategic goals to promote a connected world and support the SDGs, the responsibilities of SC86C must be emphasized, particularly during this challenging time.

Thank you all for your support over the past 8 years. My special thanks go to all the Experts, Convenors, Secretary/Assistant Secretary.

Call for a new Chair of SC 86C

- The term of office of the Chair of 86C, Mr Haruo OKAMURA, will come to an end in July 2025;
- After 9 years of service, his term cannot be extended;
- **The Secretary has initiated a "Call for nominations for the Chair of 86C" (see 86C/1941/AC);**
- The Secretariat has proposed the nomination of **Mr Hideki ISONO (Japan NC)** as new Chair;
- The deadline for additional nominations is 22 November 2024.

2024 SC 86C WG Meetings (Hybrid) 1

WG1

No. of Members	63 (from 67)	
No. NCs	17 (from 18)	
2024 Meetings	March 21, 2024 (Hybrid-SJ)	November 1, 2024 (Hybrid-QRO)
No. of Experts	17 (59% in person)	17 (69% in person)
No. of Observers	5	6
No. of Countries	8	8

WG2

No. of Members	70	
No. NCs	18	
2024 Meetings	Teleconferences 2024-04-23, -26	Querétaro 2024-10-29
No. of Experts	17	13 (10 + 3 remote)
No. of Observers	1	2
No. of Countries	11	7

2024 SC 86C WG Meetings (Hybrid) 2

WG3

No. of Members	42	
No. NCs	12	
Meetings	San Jose (hybrid) 22 March 2024	Querétaro (hybrid) 30 October 2024
No. of Experts	14	16
No. of Countries	6	6

WG4

No. of Members	48	
No. NCs	12	
2024 Meetings	San Jose Mar 22, 2024	Querétaro Oct 31, 2024
No. of Experts	13	12
No. of Observers	3	6
No. of Countries	7	8

Working Group Progress: WG1(1)

"Fibre Optic Communications Systems and Subsystems"

Convenor:Mr. Marc Breton

WG1 activities since the previous 86C Plenary (1)

- Major agreements and actions
  - Publication of 61280-2-13, 61280-4-2 Ed3, 61282-14 Ed3
- Most relevant achievements
  - Circulation of
    - One CDV: 61280-2-13 (EVM)
    - One FDIS: 61280-4-2 Ed3
    - One DTR: 61282-14 (U)
    - One CD: 61280-4-2 Amd1

Working Group Progress: WG1(2)

"Fibre Optic Communications Systems and Subsystems"

Convenor:Mr. Marc Breton

- Past problems and weaknesses
  - Thanks to the efficiency of experts and officers, all previous difficulties have been solved, and there were no more issues raised.
  - The lack of young active experts in the WG is giving rise to concerns.

Future work

- Finalize:
  - Revision of 61280-4-2 (Amd)
  - Revision of 61280-4-1, -4-3, -4-5 (Amd)

- Critical aspects requiring SC86C support
  - None.
- Proposed liaison communications
  - None.

Working Group Progress: WG2(1)

"Fibre Optic Sensors" Convenor: Werner Daum,

- Most relevant achievements
  - NP IEC 61757-8-1 ED1 Fibre optic sensors - Part 8-1: Pressure measurement - Pressure sensors based on fibre Bragg gratings: circulated and approved
  - NP IEC 61757-1-4 ED1 Fibre optic sensors – Part 1-4: Strain measurement - Distributed sensing based on Rayleigh scattering: circulated and approved
- Possible problems and weaknesses
  - IEC 61757-3-2 ED1 Fibre optic sensors - Part 3-2: Acoustic sensing - Distributed sensing: revision approved, awaiting revised draft for next meeting
- Future envisaged activities
  - Finalize the revision of IEC 61757-3-2 ED1 Fibre optic sensors - Part 3-2: Acoustic sensing - Distributed sensing
  - Review for revision of IEC 61757-2-2 ED1 Fibre optic sensors - Part 2-2: Temperature measurement - Distributed sensing
  - Observation of progress in the field of quantum fibre optic sensing

Working Group Progress: WG2(2)

"Fibre Optic Sensors" Convenor: Werner Daum,

- **Relevant liaison activities**
  - **Subsea Fiber Optic Monitoring Group (SEAFOM)**
    - Updated version of DAS Parameter Definitions and Tests - SEAFOM MSP-02 V2.0 (2024) available
  - **ITU-T Study Group 15**
    - Distributed Fibre Optic Sensing (DFOS) has become a big topic in Q2, Q6 and Q8 to monetize their networks
    - Harmonisation between IEC documents and ITU-T documents under development should be ensured.
    - Letter of interest from WG2 to ITU-T SG15 Q6 offering expertise and support

- **Documents proposed for reconfirmation (new SD)**

  IEC 61757-2-1 ED1 (2028) 61757-1-2 ED1 (2029) 61757-4-3 ED1 (2029)

- **Agreed to propose a New Title (and Scope) of SC86C**

  Fibre optic communication systems, active and sensing devices

Working Group Progress: WG3(1)

"Optical Amplifiers and dynamic modules "

Convenor: Atul Srivastava, US, Secretary: Takashi Shibuya, JP

- Major agreements and actions
  - 2 AMDs of International Standards were published since the last Plenary
    - 62343-1:2019 AMD1: 2023, 62343-2-1 :2019 AMD1: 2023
  - Revised three documents
    - 61290-1-2, 61291-5-2, 62343
  - New proposal
    - 61290-x-y
  - Recommended 28 documents for reconfirmation
- Most relevant achievements
  - Close cooperation between WG3 and WG4 on pump laser modules
  - EMC requirements in Dynamic modules

Working Group Progress: WG3(2)

"Optical Amplifiers and dynamic modules "

Convenor: Atul Srivastava, US, Secretary: Takashi Shibuya, JP

- Current industry trends
  - Arrayed amplifiers with shared pumps for CDC ROADMs
  - Development of SDM ROADMs ultra wideband amplifers
  - Need for 1310 nm fibre amplifiers
  - Application of SOAs in datacom links ▸ MCF-EDFAs
- Future envisaged activities
  - 1310 nm fibre amplifiers ▸ SOA for datacom applications ▸ MCF-EDFAs

Actions required by SC86C

- new work items 61290-x-y, Test method for PM-OAs (PL: Haicheng Yin)
- Revisions • 61290-3-2 (PL: Makoto Yamada)

Working Group Progress: WG4(1)

"Fibre Optic Active Components and Devices" Convenor ; Hideki Isono,

Major agreements and actions

- Test and measurement procedures, Calculation methodology of laser safety class for optical transceivers and transmitters (TR 62150-7,Ed. 1) **IS** published in Sep 2024.
- Semiconductor optoelectronic devices for fibre optic system applications , Measuring methods (62007-2,Ed. 3)

  FDIS. decided to be circulated
- Packaging and interface standards, SFF 10 pin transceivers (62148-2/AMD1, Ed. 2) moved to publication.
- Packaging and interface standards, 14-pin active device modules (62148-11, Ed. 3) moved to publication.
- Performance standards, 1 300nm fibre optic transceivers for Gigabit Ethernet application (62149-4/AMD1, Ed. 3)

  CDV was circulated in Sep 2024.
- Performance standards, RoF (Radio over Fibre) transceivers for mobile front-haul (62149-10,Ed. 2) decided to prepare CD draft.

Working Group Progress: WG4(2)

"Fibre Optic Active Components and Devices" Convenor ; Hideki Isono,

Joint work with WG3:

- WG3 requested standardization of pumping lasers

WG4 is working on

- Package standard : Publication of IS in progress
- Performance template: Prepare NP draft (62149-XX)

  Achieved consensus of opinions with WG3
- Test methods To be discussed

- Most relevant achievements
  - CDV documents circulated : 4
  - FDIS documents circulated : 1
  - DTR documents circulated: 1
  - IS published: 1
- Relevant liaison activities
  - TC103

Working Group Progress: WG4(3)

"Fibre Optic Active Components and Devices" Convenor ; Hideki Isono,

- **Current industry trends**
  - **High speed transceivers supporting high data throughput networking/ datacom equipment**
    - Line side: Digital coherent, 800G/1.6T/**3.2T**
    - Client side: up to 800G/1.6T/**3.2T**
    - **AI/HPC/ML: Low power sonsumption/Low latency/High density interconnection)**
  - **Small and low power consumption, lower cost**
    - **High integration:** InP/ SiP/Heterogeneous, CPO/LPO
    - **High bandwidth/ Multi-Channel (O/S/C/L/U)/ SDM**

2024 SC86C Maintenance(1)

Reconfirmed WG1, 2

WG1 Documents proposed for reconfirmation:

New SD 2027: 61280-1-3, 61280-4-4, 61282-10

New SD 2029: 61281-1

New SD 2030: 61280-1-1, -1-4, -2-1, -2-2, -2-3, -2-9, -2-10, -2-11, -2-12,

61282-3, -4, -5, -6, -7, -8, -9, -13, -15, -16, 62614-1, -2

WG2 Documents proposed for reconfirmation (new SD)

IEC 61757-2-1 ED1 (2028)

IEC 61757-1-2 ED1 (2029)

IEC 61757-4-3 ED1 (2029)

2024 SC86C Maintenance(2)

Reconfirmed WG3

Documents proposed for reconfirmation (new SD)

61290-1 (2028), 61290-1-1 (2028), 61290-4-3 (2030),

61290-5-3 (2030),61290-6-1 (2031), 61290-11-1 (2027),

61290-11-2 (2030), 61291-1 (2028), 61291-2 (2028),

61291-5-2 (2026),TR 61292-1 (2028), TR 61292-3 (2028),

TR 61292-4 (2029), TR 61292-6 (2030), TR 61292-12 (2029),

62343-1-2 (2030), 62343-1-3 (2029), 62343-3-1 (2030),

62343-3-2 (2030), 62343-5-2 (2030), TR 62343-6-2 (2030),

TR 62343-6-4 (2030), TR 62343-6-6 (2030), TR 62343-6-7 (2030),

TR 62343-6-8 (2030), TR 62343-6-9 (2030), TR 62343-6-10 (2030),

TR 62343-6-12 (2030)

2024 SC86C Maintenance(3)

Reconfirmed WG4

- **Documents proposed for reconfirmation (new SD)**

62007-1 (2027), 62148-3 (2028), 62148-5 (2028), 62148-12 (2027), 62148-15 (2028), 62148-16 (2028), 62148-18 (2028), 62148-19 (2028), 62148-22 (2028), 62149-1 (2028), 62149-3 (2028), 62149-8 (2028), 62149-9 (2028), 62149-11 (2028), 62149-12 (2028), 62150-1 (2028), 62150-2 (2028), 62150-3 (2028), 62150-4 (2028), 62572-3 (2028), TR63072-1 (2028)

2025 Interim Working Group Meetings

Traditionally, 86C has held its interim meetings in conjunction with OFC. OFC 2025 will be held from 30 March to 3 April in San Francisco, USA

2025 SC 86C Interim Meetings

WG 1, WG 3 and WG 4: Hybrid Meetings with Teleconference
Tentative Dates: 27 – 28 March 2025 (2 Days)
Tentative Location: San Jose, California (USA)

Due to conflicts with the hybrid meeting dates:

WG 2: 2 Teleconference-Only Meetings (3 Hours Each)
Tentative Dates: 8 and 11 April 2025 (2 Days)

Key Decisions at 86C Plenary, 2024-11-4 (Queretaro)

Proposed New Tile and Scope of SC86C requests TC86 approval

New Title; Fibre Optic Systems, Sensing and Active Devices
Current title; Fibre Optic Systems and active devices

New Scope

To Prepare international standards for fibre optic systems, sensing and active devices embracing all types of communication and fibre optic sensing applications. This activity covers terminology, characteristics, test and measurement methods and functional interfaces, including all mechanical, environmental, optical and electrical requirements to ensure interoperability and reliable system performance

Here, 86C chair proposes TC86 Plenary to discuss the following change;
all types of communication and fibre optic sensing applications
→ → all types of fibre optic applications (to include, e.g., F-O power supply)

Key Decisions at 86C Plenary, 2024-11-4 (Queretaro)

- 77 documents reconfirmed
- 1 revision approved
- 3 new projects approved
- Liaison from from WG 2 to ITU-T SG15/Q6 approved
- New title and scope of SC 86C agreed

Proposed change of a Decision at 86C Plenary,

New Title **Fibre Optic Systems, Sensing and Active Devices**
(Current title; Fibre Optic Systems and Active Devices)

New Scope

To prepare international standards for fibre optic systems, sensing and active devices embracing all types of communication and fibre optic sensing applications. This activity covers terminology, characteristics, test and measurement methods and functional interfaces, including all mechanical, environmental, optical and electrical requirements to ensure interoperability and reliable system performance

Why? to include e.g., fibre optic power supply

86C chair proposes the following change of scope at the next occasion.

all types of fibre optic applications

IEC SC86C Plenary Meeting Participants

“Fibre Optic Systems, Sensing and Active Devices”

Title is to be approved at TC86 Plenary

Special Thanks

To

- **WG Conveners and Experts**
- **SC 86C Secretary, Assistant Secretary**
- **Liaison Officers**
- **IEC Technical Officers and CO Staffs**

And, last but not least
Special thanks to our meeting host
Mexico National Committee