Global Standardization Activities

IEC TC86 WG4 Standardization Activities Aimed at Developing International Standards from Domestic Standards

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Abstract

This article describes the progress in the International Electrotechnical Commission (IEC) on global standardization of a method for calibrating optical measurement equipment and its relation to a Japanese domestic standard.

1. Introduction

With the rapid spread of fiber to the home (FTTH) in recent years, the importance of optical testing technology for the construction and maintenance of optical fiber cable networks has been increasing. In terms of evaluating the characteristics of optical fiber cable networks and optical devices, the standardization of the calibration method plays an important role in guaranteeing the performance of optical measurement equipment.

2. IEC

Standardization activities related to fiber optic measurement equipment calibration and its procedures are the concern of the International Electrotechnical Commission (IEC) [1]. The IEC is a leading global organization that prepares and publishes international standards for all electrical, electronic, and related technologies. These serve as a basis for national standardization and as references when international tenders and contracts are drafted. The IEC was founded in 1906. As of March 2011, 81 countries were registered as members or associate members of the IEC. Standards are discussed by Technical Committees (TCs). Subcommittees (SCs) and Working Groups (WGs), which work under the supervision of a TC, are established as necessary. IEC TC86 WG4 (Fiber optic test equipment calibration) was set up in 1985 by TC86 (Fiber optics) to discuss standards related to calibration methods and procedures for optical measurement equipment.

The Japanese National Committee of TC86 is organized by the Institute of Electronics, Information and Communication Engineers (IEICE), which has a strong relationship with the Standardization Technical Committee of Japanese Industrial Standards (JIS), which is organized by the Optoelectronic Industry and Technology Development Association (OITDA). After policy on how to deal with issues has been approved by the national committee in Japan, members of the Japanese National Committee of TC86 WG4 participate in discussions at IEC TC86 WG4 meetings. The relationships among these committees is shown in **Fig. 1**.

3. Standards development process in IEC

An International Standard (IS) results from agreement among the IEC's National Committees. The technical work is developed through project stages. The sequence of project stages and the name and

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Fig. 1. Relationships among IEC Technical Committee, IEC Japanese National Committee, and JIS Standardization Technical Committee related to IEC TC86 WG4.

Project stage	Associated document			
FT0ject stage	Name	Abbreviation		
Preliminary stage	Preliminary Work Item	PWI		
Proposal stage	New Work Item Proposal	NP		
Preparatory stage	Working Draft(s)	WD		
Committee stage	Committee Draft(s)	CD		
Enquiry stage	Committee Draft for Vote	CDV		
Approval stage	Final Draft International Standard	FDIS		
Publication stage	International Standard	IS		

Table 1. Project stages and associated documents.

abbreviation of the document associated with each stage are listed in **Table 1**. The associated documents are prepared during the corresponding stages and submitted as comments and voted on by the participating member countries (P-members) within the TC or SC. They then proceed to the publication stage. For each stage, there is a commenting or voting period of two to five months, and it might be several years before an IS is issued.

For example, in the proposal stage, a proposal for new work generally originates from industry via a National Committee. It is then communicated to the members of the appropriate TC or SC. A New Work Item Proposal (NP) is approved after a commenting and voting period of three months if:

- the committee's P-members approve it by a simple majority and
- if enough experts nominated by the P-members approve it. For committees with 16 or fewer Pmembers, the minimum number of experts is four; for committees with 17 or more P-members, it is five.

The proposal is rejected if it does not satisfy the above requirements.

4. Development procedure of IEC-PAS

To enable a Publicly Available Specification (PAS) [2] originally developed by a consortium or forum with a common interest to be accepted by the IEC, the IEC has a structure called the IEC-PAS [3]. An IEC-PAS is either published by the IEC after organizations outside the IEC reach a consensus or published by the experts in an IEC WG. It may also be published to meet urgent market needs. It is published after the committee concerned has confirmed its content and checked that there are no conflicts with existing ISs and after simple majority approval in a vote by the P-members on the committee. An IEC-PAS can be developed as an IS in parallel with the above procedure. Although some WGs have utilized the PAS development procedure actively since 2000, the PAS publication process was revised in 2007 because the PAS procedure was being used to avoid the need for NP approval, and the handling of comments on the draft IEC-PAS was causing confusion. Since 2007, an IEC-PAS must be approved in the proposal stage if it is to be published as a Technical Specification (TS) or as an IS. A simplified diagram of the normal



Stages enclosed by dotted circles may be omitted.

Fig. 2. Simplified diagram of IEC publication procedure.

procedure for developing an IS and the PAS development procedure is shown in **Fig. 2**. The IEC-PAS is approved by a simple majority of the committee's Pmembers after a three-month commenting and voting period.

5. Reflecting domestic standards in international standards

5.1 Trend of standardization activity of optical measurement equipment calibration

IEC TC86 WG4 has established a Sub-Working Group (SWG) for each study item, and each SWG discusses standards related to optical measurement equipment. The Japanese National Committee of IEC TC86 has proposed the JIS draft (which includes the JIS that has already been standardized) being prepared by the IEC TC86 WG4 National Committee as a new international standard. Therefore, the Japanese National Committee is providing project leaders for some SWGs. The standardization activities in IEC TC86 WG4 are listed in **Table 2**.

5.2 Calibration of optical spectrum analyzers

IEC 62129 "Calibration of optical spectrum analyzers", which was published in 2006, was approved as an IS after first being positioned as a PAS drawn up by a regional standardization organization and then proposed and approved as an IEC-PAS in IEC TC86 WG4. This is an example where the JIS was developed as an IS in parallel with being positioned as an IEC-PAS. However, since the scope of IEC TC86 WG4 is limited to calibration methods and procedures for optical measurement equipment, some parts of the description related to test methods were revised and removed from the draft IEC-PAS. The maintenance

Sub-Working Group	Project number	Established	Title	Project leader
SWG1	IEC 61315	Oct. 2005	Calibration of fibre optic power meters	Canada
SWG2	IEC 61746-1	Dec. 2009	Calibration of optical time-domain reflectometers (OTDR) - Part 1: OTDR for single mode fibres	France
	IEC 61746-2	Jun. 2010	Calibration of optical time-domain reflectometers (OTDR) - Part 2: OTDR for multimode fibres	Trance
SWG3	IEC 61744	Sep. 2005	Calibration of fibre optic chromatic dispersion test sets	Canada (interim)
SWG4	IEC 61745	Aug. 1998	End-face image analysis procedure for the calibration of optical fibre geometry test sets	Canada (interim)
SWG5	EC 62129	Jan. 2006	Calibration of optical spectrum analyzers	Japan
SWG7	IEC 62129-2	May 2011	Calibration of wavelength/optical frequency measurement instruments - Part 2: Michelson interferometer single wavelength meters	UK
SWG8	IEC 62522	CD	Calibration of tuneable laser sources	Japan
SWG9	IEC 62129-3	PWI	Calibration of optical frequency meters using optical frequency comb	Japan

lyzers.

Table 2.	Standardization	trend in	IEC	TC86	WG4

team in TC86 WG4 is examining whether there is a need to revise this standard because the time for its revision is approaching.

6. Concluding remarks

to the Annex, as in the case of optical spectrum ana-

5.3 Calibration of tunable laser sources

IEC 62522 "Calibration of tuneable laser sources", which is currently at the committee stage, is also a document that was proposed for new IEC international standardization from Japan based on JIS C6191 "Test methods of tunable laser sources". It was initially considered that the international standardization of this document would be processed after it was published as an IEC-PAS like the calibration of optical spectrum analyzers, but it will be processed via the normal IS procedure because the PAS procedure has been changed.

However, since a document regarding tunable laser source (TLS) test methods has already been prepared as a JIS in Japan, and the necessity for TLS calibration was fully recognized in TC86 WG4, we easily obtained cooperation aimed at NP approval. Since there was a domestic standard (JIS) in Japan and the market demand had increased, it was easy to obtain the agreement of members to make a new IS in IEC TC86 WG4, and it seems that this became the motivation behind the promotion of IEC international standardization.

However, since the JIS, which is a domestic standard, prescribes a TLS test method, namely not only a calibration method but also a performance guarantee as an industrial product, some revisions were made that moved some of the test method description This article introduced standardization activities related to calibration methods and procedures for optical measurement equipment in IEC TC86 WG4 and the relationships to domestic standards in Japan. The Japanese national standards, JIS, must harmonize with IEC specifications because of the World Trade Organization Technical Barriers to Trade (WTO/TBT) scheme [4]. The organization deliberating the standardization of optical measurement equipment in Japan is proceeding with the transfer of important IEC international standards in a related field to JIS. Meanwhile, that organization is also proceeding with an approach that reflects Japanese advanced technologies in international standards by proposing a JIS as a new international specification.

Some JISs related to optical measurement equipment have been specified as measurement equipment test methods. These JISs include descriptions that go beyond the category of calibration method specification in IEC international standards. This highlights the issue of JIS and IEC international standards having different standardization structures.

Members of the Japanese standardization committee are investigating the differences between JIS and IEC standards including the above issues and will try to resolve these problems. They have also made a timely proposal regarding a standard in the field of optical measurement equipment calibration, for which technical studies are proceeding, and they continue to take an approach aimed at producing international standards derived from domestic standards.

References

- [1] IEC. http://www.iec.ch/
- [2] PAS: http://en.wikipedia.org/wiki/Publicly_Available_Specification
- [3] IEC-PAS. http://www.iec.ch/standardsdev/publications/pas.htm
- [4] WTO/TBT. http://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm



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