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BUSINESS PLAN FOR JTC 1/SC 23
Digitally Recorded Media for Information Interchange and Storage
Period Covered: October 2015 – September 2016

1.0 Executive Summary

SC 23 continues to deliver technically rigorous standards that meet user requirements. During the period from October 2015 to September 2016, SC 23 published 4 standards. Those are 2nd Editions of four BD Recordable and BD Rewritable disks standards: ISO/IEC 30190 (BD-Recordable SL/DL), ISO/IEC 30191 [BD-Recordable TL(Single sided and Double sided)/QL (Single sided)], ISO/IEC 30192 (BD-Rewritable SL/DL) and ISO/IEC 30193 (BD-Rewritable TL).

In addition to discussions of the standards above, SC 23 are also discussing two standards for reliability of optical disks: optical disk lifetime estimation test method (3rd Edition of ISO/IEC 16963), and Optical disk data migration method (3rd Edition of ISO/IEC 29121). After plenty discussion at the 18th SC 23 Plenary meeting held on July 22, 2016 in Seoul Korea, these two standards come to the DIS stage now.

These two standards are expected to be published in early 2017.

In addition to these activities, at 18th SC 23 plenary meeting, its national bodies and liaison organizations were invited to propose new items for possible future standardization including High capacity and high data-transfer-rate optical-storage-media using holographic technology, a new Volume and File Format and a Format of high speed data-search technology for optical archive systems. These items are currently discussed in Ecma International (ECMA) TC31.

2.0 Chairman's Remarks

2.1 Market Requirements, Innovation

The total amount of digital data distributed world-wide will expand from 2.8 ZB (Zettabytes, equivalent to 1,000 EB (Exabytes) or 1,000,000 PB (Petabytes)) in 2012 and becomes 40 ZB in 2020 (Source: IDC and EMC 2012). On the other hand, the total storage capacity on all storage media, which includes Hard Disk Drive HDD, Magnetic tape (MT, including LTO), Semiconductor memory (SSD), Optical disk drive (ODD) etc., will also expand from 2 ZB in 2012 to 12 ZB in 2018 (Source: TSR). Even though not all of the distributed digital data will be stored in some types of storage devices, it is expected the storage-capacity of each type will steadily increase.

Under such conditions, recently, the data-archive storage market for IoT and/or Big data application, cloud computing service, etc. has become almost-considerable business area. The total archive storage capacity will rapidly increase from 135 EB in 2012 to 2.8 ZB in 2020. The growth of long-term preservation archive is 42% average and active archive is 35% average.

Regarding usage of media for these markets, more than 60% was covered by MT before 2010. However, HDD is taking over MT's position gradually and will be cover more than 80% of the data archive market in 2018. On the other hand, usage of ODD for this market will be limited because of the lesser capacity per disk than the other media. Even under such conditions, it is noted that users are encouraged to understand the unique features of optical disks such as water-proof function. These characteristics will help users to recover the data from the damage

on disasters, such as Hurricanes and/or Tsunamis.

Furthermore, other characteristics of Optical Disk's such as long life and low system power consumption are useful in data-archival applications. Therefore, optical storage technologies with higher capacity over 1TB per disk and ODDs with higher data-transfer rate are expected. (Source: Fuji Chimera Research Institute, Inc.)

2.2 Accomplishments

For the past many years, manufacturers of optical disks of ODDs with established and well-recognized technologies have lead the standardization of optical disks. They have used fast-track procedure through ECMA and/or the SC 23 National Body of Japan (JNB). SC 23 will carry forward in international standardization in collaboration with ECMA and SC 23 JNB. SC 23 will continue to monitor the activities of disk-format creation parties, such as the Blu-ray Disc Association and others, and encourage them to propose their specifications for adoption as International Standards.

Furthermore, as the expansion of IoT, Big Data and Cloud Computing services, much data will be created, distributed and stored in storage systems.

Under such condition, the specifications of storage medium, such as its capacity and data transfer rate, etc. should be improved more and more. In addition to such improvement of physical specifications, new logical data format appropriate to such data preservation and archive application is also needed.

SC 23, therefore, will continue to provide the platform across the entire spectrum of Digitally Recorded Media in collaboration with any related JTC1 SCs and WGs, ISO/TCs and ECMA.

2.3 Resources

Recently development and manufacturing facilities of storage devices have been concentrated to few countries. Consequently SC 23 p-members decreased to 7 countries. Nevertheless, adequate resources for the development of standards are still available for all current and anticipated projects.

In addition to the current standard creation for physical specifications of storage devices, SC 23 should expand its work area, but within the scope, to the data preservation and archive application area and will develop new logical Volume & File Format and Quick Data-search Format, etc. To discuss these formats, SC 23 will invite experienced experts for not only current optical disk physical technologies but also logical format engineers such as Big-Data experts, cloud service engineers, etc.

To facilitate those meetings, SC 23 should have remote participation whenever possible.

2.4 Competition and Cooperation

The full SC 23 Membership list can be found at [SC 23 Member Listing](#). SC 23 has made a conscious effort to reduce or eliminate competition with other standards groups by establishing an extensive network of liaisons both internal and external to JTC 1. A list of liaisons can be found at [JTC 1/SC 23 Liaisons](#).

Noteworthy liaisons are with ISO/TC 41 Photography, ISO/TC 171/SC 1 Document Management Applications - Quality, IEC/TC 100/TA 6 Audio, video and multimedia equipment

and systems – Storage media, data structures, equipment and systems. The Category A liaison with ECMA has resulted in numerous additions to the SC 23 catalogue of standards.

Recent two SC 23 plenary meetings in 2014 and 2016 were held in Estes Park, Co. USA and Seoul Korea. Both of them were co-located with ECMA/TC31 to encourage cross pollination of the memberships.

Furthermore, SC 23 will investigate the possible procedure of joint standard development with ECMA TC31 for future standardization items.

3.0 Standardization Projects

3.1 Standardization of Physical BD Format

(1) 2nd. Edition of BD-Recordable TL* disk Standard; ISO/IEC 30191: 2015 (Ed.2, addition of Double Sided Disk)

*; TL: Triple Layer (100,0 Gbytes per disk)

This edition of the standard additionally specifies the mechanical parameters of triple layer double-sided disk. Both sides of the disk are read-out surfaces and have the same structure as the read-out surface of a Type TL disk defined in the 1st Edition of ISO/IEC 30191: 2013. This revision was proposed as a new work item via SC23 JNB at 17th SC 23 Plenary meeting in September 2014. Taking the normal standard process, ISO/IEC DIS 30191 Second edition was published on November 1, 2015.

(2) 2nd Edition of BD-Recordable SL/DL** disk Standard; ISO/IEC 30190: 2016 (Ed.2),
2nd Edition of BD- Rewritable disk SL/DL disk Standard; ISO/IEC 30192: 2016 (Ed.2) and
2nd Edition of BD- Rewritable disk TL disk Standard; ISO/IEC 30193: 2016 (Ed.2)

**; SL: Single layer (25,0 Gbytes per disk), DL; Dual layer (50,0 Gbytes per disk)

After the publication of the 1st Edition of these three International Standards on 2013, SC 23 JNB found some errors during their national standardization process in Japan. SC 23 JNB made defect reports and requested for Draft Technical Corrigenda (DCOR) each on January 19, 2015. After those DCOR approvals on May 22, 2015, through two months FDIS ballot, those three International standards were approved on February 15, 2016 and were published as 2nd Edition with full text documents on June 15, 2016.

3.2 Standardization of Optical disk Reliability

(1) Test method for lifetime Estimation of Optical disks: ISO/IEC WD 16963 (Ed.3)

After 2nd Edition of ISO/IEC 16963:2015 published on March 13 2015, SC 23 JNB proposed minor enhancement of the standard which provides additional testing conditions: the combinations of stress conditions and disk-testing-locations with WD for 3rd. Edition of this standard. This proposal was approved on January 8, 2016.

After the CD ballot, at 18th SC23 Plenary meeting, the disposition of comments on CD 16963 with additional editorial modifications was discussed and approved. The revised final text provided by co-editors was already submitted to ITTF for DIS processing.

(2) Data migration method for optical disks: ISO/IEC 29121 (Ed.3)

ISO/IEC 29121 provides specifications that allow users to monitor continuing conformance and secure data migration for long-term data storage of DVD-R, DVD-RW, DVD-RAM, +R and +RW disks.

After the publication of the 2nd Edition of ISO/IEC 29121:2013, International Standards for BD Recordable and BD Rewritable disks (ISO/IEC 30190, 30191, 30192 and 30193) were published in 2013 and International Standards of test method for lifetime estimation of optical disks (ISO/IEC 16963) was revised to add test specifications for BD Recordable and BD Rewritable disks and published as the 2nd Edition in 2015. CD-R and CD-RW disks are also incorporated in ISO/IEC 16963:2015.

BD Recordable and BD Rewritable disks are suitable for professional and/or enterprise areas with larger storage capacity. Secure data migration to new disks is very important for professional and/or enterprise area.

Under such considerations, a new project, revision of ISO/IEC 29121:2013 to include BD Recordable, BD Rewritable, CD-R and CD-RW disks was proposed on September 15, 2015 and approved on February 10, 2016.

After the CD ballot, at 18th SC 23 meeting, the disposition of comments on CD 29121 was discussed. Based on the discussion result, the revised text with additional editorial corrections was already submitted to ITTF for DIS processing.