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Business Plan for ISO/IEC JTC 1/SC 31

2008-06-03

Automatic Identification and Data Capture Techniques

ISO/IEC JTC 1/SC 31 (SC031-N-2525)

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Business Plan for ISO/IEC JTC 1/SC 31 Automatic Identification and Data Capture Techniques

Period Covered: June 2008 - June 2009

Submitted By: Chuck Biss (USA), Chairman, ISO/IEC JTC 1/SC 31
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1 Management Summary

1.1 Chairman's Remarks

With the release of this most recent revision of the SC31 Business Plan we mark our fourteenth Plenary, our twelfth year as an ISO/IEC JTC 1 Subcommittee, the beginning of my third year (officially) as Chairman and last but not least the first time that "Chairman's Remarks" have been included in our business plan. As a new, first time grandparent, I have been prone to draw analogies between this committee's growth and that of a beloved child. And for a budding, and at times troubled, "pre-teenager" we in SC31 are doing quite well for ourselves negotiating the world of International Standards and our industry of Automatic Identification and Data Capture.

Though some of us, who have been involved since the beginning, may be "showing our age", with **31** National Body voting members, **8** observers and **25** liaisons working through six Work Groups (one a very recent addition to the family) on **80** projects and standards we still exhibit the exuberance, excitement and near constantly changing face of youth as the technologies in our arena of AIDC grow and develop and become more widely accepted and applied (how many billions of bar code symbols are scanned each and every day globally?).

As with any "child" and their growth experience we have not gotten here totally without bumps and bruises, trials and tribulations, as we negotiate the intermingling world of technology, standards and business… coming upon new acquaintances in our liaisons and cooperative efforts, making friends and comrades where and when we can… sometimes our experiences come so fast there are hard to comprehend and some are of course painfully slow. Those bumps and bruises do heal with time and care and we will assuredly have more along the way as our industry continues to expand its reach and scope and we with it continue to expand our catalog of standards.

As I look at where we have been, the friends made and lost (for various reasons), the growth and "maturity" (?) of bar code (optically read media?) and the beginning years of RFID & RTLS (as we know them each today)… I would like to personally thank each and every one of you (and those no longer active within our groups) for your hard work, long meetings, diligent efforts, spirited debate and overall dedication in advancing the cause of open International standards.

And as I look forward to the future (new bar code symbologies, advances and expansion of RFID, mobile commerce, mobile item identification and management, and… what else is around the corner?) I feel some of the same anticipation and awe that I did as I experienced the growth of my children over the past twenty-five to thirty-five years and that I now anticipate as my seven month old granddaughter starts her life… and that I did at our very first plenary back in 1996.

In looking back at what has made us sGS1 USessful I know that if we pay attention to our goals, drive forward together, keep open minds and attitudes, look for new opportunities, grow our ranks to include as many as we can in the process and continue to show the dedication and perseverance that we have, we can not help but continue to create the standards that our industry and markets need to thrive and grow.

1.2 JTC 1/SC 31 Statement of Scope

Title: Automatic Identification and Data Capture Techniques

Area of Work: Standardization of data formats, data syntax, data structures, data encoding, and technologies for the process of automatic identification and data capture and of associated devices

utilized in inter-industry applications and international business interchanges. Excluded are work areas assigned to another international subcommittee or international technical committee, including:

- ISO TC 104/SC 4/WG 2 in the area of work on Automatic Electronic Identification for Containers and Container related Applications
- ISO TC 23/SC 19/WG 3 in the area of work on Identification of Animals
- ISO TC 204 in the area of work on RFID for Transportation and Control Systems
- ISO/IEC JTC 1/SC 17 in the area of work on Cards and Personal Identification
- ISO TC 68/SC 6 in the area of work on Financial Transaction Cards, Related Media, and Operations
- ISO TC 122/WG 4 in the area of work on Packaging Bar code Label.

1.3 Project Report

JTC 1/SC 31 Programme of Work

1.4 Co-Operation and Competition

SC 31 continues the close relationship with SC 17 developed under the Technical Direction program.

JTC 1 approved a change in the Area of Work for SC 31 to distinguish it clearly from the with SC 17 area. A Memorandum of Understanding (MoU) exists between the two SCs reflecting the spirit and details of the relationship.

Increasingly there are consortia including GS1 through EPCglobal that are looking to standardize technologies that have traditionally been the responsibility of ISO. This is causing confusion in the marketplace. The common reason stated for this activity is that ISO takes too long and is difficult to interface with.

SC 31 has focused extensively over the past 18 months with its participating members from EPCglobal in incorporating industry accepted standards into ISO. Furthermore SC 31 is conscious of the length of time of development of standards but through increased membership is striving to improve on the duration to complete standards. SC 31 recognizes the value globally accepted industry standards bring to the public at large.

There is also an on going awareness and sensitivity to potential conflicts that result from such a close relationship. Members are reminded to abide by the rules set up by ISO regarding declaration of possible conflicts when presenting an opinion when participating in meetings.

In addition there have been cases during the past year where the development of application standards has moved forward within the ISO framework. This has caused some difficulties until the correct liaison and working relationships can be created. An example of this is the work in the ISO TC 104/122 Joint Working Group. This committee is now moving forward building on the work of SC 31. This is an area where further work by ISO to provide guidelines for these events will be very useful.

The SC 31 scope implies the leading role of this subcommittee in the area of automatic identification and data capture techniques. However, at the moment there is no complete list nor classification of the techniques relating to the AIDC area, including techniques maintained by other ISO committees and subcommittees (for example, ISO/IEC JTC1/SC17, TC 68). There is no broad classification of data carriers & the equipment used in AIDC. There is a need to research the existing AIDC technologies within SC 31, their systematization and classification, as well as data carriers and the equipment used in the area of AIDC.

Standards in the area of the systems of quality management developed by ISO/TC 176 “Quality management and quality assurance” establish the requirements for the identification and traceability throughout product realization. However, the role of AIDC techniques in these processes is not being duly considered. There is a need to research the influence of AIDC techniques on the systems of a quality management specified by ISO/TC 176 standards. Such research could result in a guideline for improving identification and traceability processes in quality management systems.

1.5 Membership

JTC 1/SC 31 Membership

2 Period Review

2.1 Market Requirements

AIDC serves many different applications (e.g., product/item identification, point-of-purchase/use, track and trace, product distribution) in such market sectors as retail sales, health care, supply chain, transportation, and many areas of the manufacturing and service industries, where reliable, fast and automated data input with reduced errors improves operational efficiency with a positive impact on financial returns. AIDC technologies are vital elements in global commerce and are among the basic enablers for the adoption of Electronic Commerce. They provide timely and cost-effective data on the business processes that cover product life cycles including ordering, back office operations, manufacture, distribution, sale, use, repair, warranty, and return of products.

The initial priority for SC 31 work was in the field of linear bar codes. This area continues to be a major work area with new bar code symbologies being developed and standardized. Existing standards have entered the 5 year review period and are undergoing update to incorporate progressive improvements in technology and to protect their visibility. The Aztec Code symbology, in the list of the two dimensional symbologies, that have growing adoption.

The continued interest in the RFID market sector can be seen with the impact Marks and Spenser has made in retail. GS1 is also accelerated its penetration in the market place and have expanded deployments beyond the distribution channels. The most important area of growth is in the east where mobile RFID is now a reality with chip based readers and RFID seem to be penetration various markets from pig tagging to toll collection. Work is done in directed marketing using RFID on mobile phones. IATA is showing that interoperability is possible in the air line baggage management domain. A place of concern though remains the privacy activists distorting the capabilities of RFID. Higher levels of consumer and public education will be required. RFID and RTLS in vehicle regulation and crime prevention is also gaining ground with a roll out in Bermuda and projects in South Africa, Brazil, Argentina and Mexico.

The new IDTechEx report **RFID Forecasts, Players & Opportunities 2008-2018** reports that *in 2008 the value of the entire RFID market will be $5.29 billion, up from $4.93 billion in 2007. This includes tags, readers and software/services for RFID cards, labels, fobs and all other form factors. The majority of this value is due to large national RFID schemes for transportation and national ID, incorporating contactless (RFID) cards. For example, China has almost completed issuing each citizen with a national ID RFID card. The tagging of pallets and cases as demanded by retailers (mostly in the US) will use approximately 325 million RFID labels in 2008, but we see strong take off in retail outside mandates, such as from Marks & Spencer who have used well over 100 million RFID tags to date. The tagging of animals (such as pigs and sheep) is quickly taking off as it becomes a legal requirement in many more territories, with 90 million tags being used for this sector in 2008. This is happening in regions such as China and Australasia. In total, 2.16 billion tags will be sold in 2008 versus 1.74 billion in 2007 and 1.02 billion in 2006. In 2008, 57.3% of the total market value for RFID will be spent on cards and associated infrastructure, with $2.26 billion of the total $5.29 billion being spent on all other forms of RFID - from RFID labels to active tags. By volume, the tag part of the RFID market is dominated by labels or label like tags (such as tickets) which is 62.4% of the tag type shipped in 2008.*

With the help of its national members, SC 31 continues to investigate the business demand for the standardization of other AIDC technologies. Such investigations are being done on a regular basis since needs change quickly. The implementation of direct part marking with two dimensional symbologies precipitated the identification of issues with the verification of two dimensional symbologies used as direct part marking. The standards community including SC 31/WG 1 has responded but final testing and acceptance of the proposed solutions will take several years. Work continues in this area. Likewise the conformance and performance aspects of RFID and RTLS have taken center stage with users and manufacturers alike pushing for progress.

One area where the market has needed help is in the area of frequency regulation for RFID around the world. With the many disparate organizations controlling the regulation of frequencies, the ability to generate truly global standards has been severely affected. This remains the case in 2008. The members of the committee have stepped in and worked with the regulators in many parts of the world to assist them in understanding the needs of RFID and the fact that it is a global technology with the need for global agreement on frequency regulation. The efforts of these individuals and their companies have helped to forward these objectives. The thought occurs that this work which is essentially education and lobbying would be more effective if it could be studied and refined to become an official part of the ISO process.

There is growing adoption of two dimensional symbologies such as Data Matrix, QR Code and PDF 417, in response to space constraints and the need for expanded data capacity. Vendors are finding a ready place in military, industrial and pharmaceutical applications. Direct Part Marking and the need to permanently mark high cost serially managed industrial items has highlighted the need to totally revise the 2D print quality standard for the subtractive techniques of dot peening and etching in response to market requirements.

The market interest in unique permanent identification of supply chain items has dramatically increased and additional standards are in the works to accommodate market sectors in addition to supply chain items. Additionally, the expanding RFID market has identified a need for battery assisted and sensor enabled RFID tags. Extensive work by: WG 4/SG 3 – specific to the impact on the air interface and WG 4/SG 3 - specific the impact on data encoding, was done in 2007.

2.2 Achievements

The committee has a tremendous amount of work underway, with several new work items just being approved and several more expected in the next period. The extent of these accomplishments can be reviewed by examination of the project table links within this report.

The overall progress of SC 31 and the Working Groups has led to considerable improvement in the quality and quantity of standards across the entire spectrum of SC 31 deliverables. Since the 2007 Plenary, **15** projects have advanced to Final Draft International Standard (FDIS) status, and **2** standards (IS) have been published (bringing the total to **40** IS since the formation of SC 31). It is envisioned that by the 2009 plenary, the subcommittee will have approximately **43** International Standards published (or close to publication). Sixteen (**16**) new NPs have been filed since the 2007 Plenary. (See section 2.5 for full details).

Participation by software vendors in WG 3/SG 1 have prompted the development of standards associated with software architecture and data security.

A new work group was created to deal with mobile item identification and management. This has become a important aspect automated identification through the drastic growth in use of mobile technologies.

2.3 Resource

SC 31 plenary and working group meetings are well attended with Project Editors appointed as NWIs are approved and assigned to their respective working group. Provided SC 31 continues to maintain a work program relevant to the needs of the industry, it is not generally anticipated that there will be any difficulty regarding either participation or resourcing.

2.4 Environmental Issues

The work groups are continuing with the work making sure that environmental issues are addressed. Various institutions are driving the environmental issues of which the information is fed back into the SC31 standards process through the participating experts. WG4 SG3 has been taking note of the impact of RF in health, specifically heart rate monitors.

2.5 Participation Metrics

In accordance with the requirements of the JTC 1 Resolution 23 (in J1N5983) the following metrics are provided to show the activities of the SC from 1996 to 2007.

Plenary Year	Meeting Attend.	IS Pubshd.	TR Pubshd.	Revisions Pubshd.	Amendments Pubshd.	Re-affirmed (Addl. 5-Yrs)	Total IS Pubshd.	Active Projects	New Projects
1996	90	0	0	0	0	0	0	4	4
1997	226	0	0	0	0	0	0	11	7
1998	268	0	0	0	0	0	0	16	5
1999	637	8	0	0	0	0	8	10	2
2000	583	7	0	0	0	0	15	8	5
2001	428	1	0	0	0	0	16	14	7
2002	257	0	0	0	0	1	16	23	9
2003	291	0	0	0	0	0	16	35	12
2004	520	15	3	0	0	0	31	34	17
2005	302	5	2	4	0	2	36	37	14
2006	246	2	4	5	1	5	38	41	16
2007	283	2	2	2	0	1	40	53	12
2008 (Projected)	--	3	0	7	0	0	43	43	0

* Includes the number of people in attendance to Plenaries, Working Groups (Ad-hoc), and Working Group's Subgroups. Subcommittee 31's first Plenary was held in June 1996. All group meetings held in 1996 were Ad Hoc group meetings. In 1997, the Ad Hoc groups were officially established as Working Groups and the only Ad Hoc left in 1997 was the Ad Hoc on Radio Frequency Identification (established as WG in 1998). 1999 data includes two joint WG meetings. It should be noted that most Plenary, Working group and Sub-group meetings are two-three days long. A special effort is being made to reduce the time allocated for Plenary meetings in 2007 to a single day – in recognition of the value of members time and the cost associated with attending. This includes limits to presentation times and selectively focusing on issues of importance to majority of participating members.

Progress of standards once they have become ready for FDIS ballot and have left the SC's hands have moved forward at an acceptable pace., Direct personal communication – between ISO and the subcommittee and editors – is required to meet time constraints. It becomes ever more evident that the web site is a core document for communications both within SC 31 and the outside world.

2.5.1 WG 1

WG1 held one meeting since the last Plenary and plans to hold one more before the Toronto Plenary. WG1 plans to hold at least one more meeting in 2008. Three of its projects were reaffirmations of the linear industrial symbologies which all published as second editions about the time of the last Plenary. One other is in FDIS ballot and one is in FCD ballot. One standard published in its first edition and 2 NPs are currently in ballot. WG1 and WG3 together are responsible for the maintenance of the OCR standards and have not received any requests for document copies since the last Plenary, however there is ongoing activity regarding a possible update.

Following is the status of the WG1 documents:

Data Carrier Title	Project Number	Most Recent Document	Project Editor	Began Re-affirmation Work	Most Recent Action
Code 128	15417	Published version	C. Swindin	June 2005	Edition 2 published 2007-05-31
EAN/UPC	15420	31N2387	S. Ackley	December 2005	FCD ballot closes 2008-05-02
Symbology/Data Carrier Identifiers	15424	31N2196	C. Swindin	December 2005	FDIS ballot opens (estimate) 2008-04-22
PDF417	15438	Published version	H. Clark	June 2004	Edition 2 published 2006-05-24
Data Matrix	16022	Published version	S. Ackley	March 2004	Edition 2 published 2006-09-06
MaxiCode	16023	Published version	S. Ackley	August 2005	Edition 1 confirmed 2007-04-18, abstract published

Code 39	16388	Published version	S. Ackley	June 2005	Edition 2 published 2007-05-09
Interleaved 2-of-5	16390	Published version	S. Ackley	June 2005	Edition 2 published 2007-06-12
QR Code	18004	Published version	C. Swindin	September 2004	Edition 2 published 2006-08-31 and renamed "QR Code 2005"
Micro QR Code	24719	N/A	C. Swindin/ Y. Tsujimoto	September 2004	Withdrawn June 2005 and its technology combined with QR Code 18004
EAN.GS1 US Composite Symbology	24723	Published version	G. Spitz	July 2004*	Edition 1 published 2006-04-19
Reduced Space Symbology	24724	Published version	G. Spitz	July 2004*	Edition 1 published 2006-10-25
MicroPDF417	24728	Published version	C. Swindin	June 2004*	Edition 1 published 2006-05-24
Aztec Code	24778	Published version	A. Longacre	August 2006*	Edition 1 published 2008-02-11

*Note: Not re-affirmation efforts. Dates are when original work began.

2.5.2 WG 2

Working Group 2 has met once since the last Plenary meeting (15 January 2008 in Clearwater, USA) since the last 13th Plenary of SC 31 held June 2007 in South Africa. It has also scheduled a meeting immediately before the 14th Plenary of SC 31 being held in June 2008 in Canada
Working Group 2 has made progress its three assigned Work Items during the past period:
ISO/IEC 15418 - JTC 1 Secretariat have been instructed to make a Minor Revision and Title Change to “Information Technology, Automatic Identification and Data Capture Techniques - GS1 Application Identifiers and ASC MH 10 Data Identifiers and Maintenance". Publication is expected shortly.

ISO/IEC 15434 - Information technology - Automatic identification and data capture techniques - Syntax for high-capacity ADC media. Third version published in September 2006 introducing a new Format Header 12.

ISO/IEC 15459 - Unique identifiers:

- Part 1: Transport units - second revision published in May 2006
- Part 2: Registration procedures - second revision published in May 2006
- Part 3: Common rules - published in May 2006
- Part 4: Individual items - published in May 2006
- Part 5: Returnable transport items – published in December 2006
- Part 6: Product groupings – published in December 2006
- A proposed Part 7(Unique identifiers for product packaging) has been submitted by ISO TC 122 and is currently undergoing a NP/CD ballot that will close in May 2008.

2.5.3 WG 3

Working Group 3is progressing steadily through the standards up for five year review. BRM’s have been held for these documents and the documents have been forward to SC31 for ballot or publication. Two new standards are just beginning. The Japanese national body has submitted an NP on Rewritable Hybrid Media and AIM has submitted it’s Global Guideline for Direct Part Marking. Inside WG3/SG1 (RFID) ISO 18046-3 has been published on 2008-09-13.

2.5.4 WG 4

Working Group 4 has a done a substantial amount of work in the past year.

Organisation Structure and Officers

WG4	Convenor	Mr. Henri Barthel
WG4	Secretary	Mr. Gertjan van den Akker

SG1 - Application Interface Protocols	Convenor	Mr. Rick Schuessler
SG3 - Air Interface	Convenor	Mr. Steve Halliday
SG5 - Implementation guidelines	Convenor	Mr. Toshihiro Yoshioka
Regulatory Issues	Rapporteur	Mr. Josef Preishuber-Pflügl

Meetings held since last SC31 plenary

Dates	Location	WG4	SG1	SG3	SG5	Reg.
2007-07	Shonan Village Center		x			
2007-11	Aix-en-Provence		x	X		
2008-01	Clearwater	X	X		x	
2008-04	Vienna			x		

Projects and Editors

Project	Title	Editor	Remarks
18001	Application Requirements Profiles	Mr. C. Harmon	Published as TR on 2004-10-15
24729-1	Implementation guidelines - Part 1: RFID-enabled labels and packaging supporting ISO/IEC 18000-6c	Mr. C. Harmon	Approved, to be published
24729-2	Implementation guidelines - Part 2: Recycling and RFID tags	Mr. C. Harmon	Approved, to be published
24729-3	Implementation guidelines - Part 3: Implementation and operation of UHF RFID Interrogator systems in logistics applications	Mr. C. Harmon	End of PDTR ballot: 2008-06-04
24729-4	Implementation guidelines - Part 4: RFID guideline on tag data security		End of PDTR ballot: 2008-04-29
15961	Data protocol: application interface	Mr. P. Chartier	Published as IS on 2004-10-15
15961-1	Revision 1 Data protocol: Part 1: Application interface	Mr. P. Chartier	2008-04-22: end of CD ballot
15961-2	Data protocol: Part 2:Registration of RFID data constructs	Mr. P. Chartier	Ready to move to FCD; Registration Authority identified
15961-3	Data protocol: Part 3: RFID data constructs	Mr. P. Chartier	Ready to move to FCD
15961-4	Data protocol: Part 4: Application interface commands for battery assist and sensor functionality	Mr. P. Chartier	
15962	Protocol: data encoding rules and logical memory function	Mr. P. Chartier	Published as IS on 2004-10-15
15962 R1	First revision	Mr. P. Chartier	2008-04-22: end of CD ballot
15963	Unique Identification for RF tags		Published as IS on 2004-09-08
15963 R1	Revision 1	Mr. Harmon	
24753	Application protocol: encoding and processing rules for sensors and batteries	Mr. P. Chartier	Project extension approved
24791	Software System Infrastructure (six parts)	Mr. Joo-Sang Park (senior editor)	
24791-1	Software System Infrastructure -- Part 1: Architecture	Mr. Scott Barvik	CD ballot approved
24791-2	Software System Infrastructure: Part 2: Data Management	Mr. Joo-Sang Park / Mr. Masaki Ehara	WD

24791-3	Software System Infrastructure Part 3: Device Management:	Mr. Scott Barvick Mr. Luke Donnelly	WD
24791-4	Software System Infrastructure: Part 4: Application Interface		On hold; may be withdrawn
24791-5	Software System Infrastructure: Part 5: Device Interface	Mr. Rob Buck	WD
24791-6	Software System Infrastructure: Part 6: Security	Mr. Curtis Rozeboom / Mr. Ho-Won Kim	WD
18000	Air Interface	Mr. C. Harmon (senior editor)	
18000-1	Reference architecture and definition of parameters to be standardized	Mr. A. Watanabe	Published as IS on 2004-09-13
18000-1 R1	Revision 1 Part 1: Reference architecture and definition of parameters to be standardized	Mr. S. Halliday	sent for FDIS ballot on 2007-12-12
18000-2	Air interface for < 135 kHz	Mr. A. Berthon	Published as IS on 2004-09-13
18000-2 R1	Revision 1 Part 2: Parameters for air interface communications below 135 kHz	Mr. Steve Lazar and Mr. Dominique Paret	CD ballot launched April 2008
18000-3	Air interface at 13,56 MHz	Mr. R. Williams	Published as IS on 2004-09-13
18000-3 R1	Revision 1 Part 3: Parameters for air interface communications at 13,56 MHz	Mr. Ken Laing and Mr. Christophe Mani	Sent for FDIS on 2008-02-13
18000-4	Air Interface at 2,45 GHz	Mr. Josef Preishuber-Pflügl	Published as IS on 2004-08-31
18000-4 R1	Revision 1 Part 4: Parameters for air interface communications at 2,45 GHz	Mr. Josef Preishuber-Pflügl	Sent for FDIS on 2008-02-13
18000-6	Air interface at 860-960 MHz	Mr. A. Grasso	Published as IS on 2004-08-31
18000-6 A1	Amendment 1 - Mode C	Mr. J. Preishuber-Pflügl Mr. Chris Diorio	Published as AMD1 on 2006-06-19
18000-6 A2	Amendment 2 (Batteries & sensors)	Mr. J. Preishuber-Pflügl Mr. Chris Diorio	Cancelled
18000-6 R1	Revision 1 Air interface at 860-960 MHz	Mr. Farron Dacus and Mr. Josef Preishuber-Pflügl	2nd CD ballot passed
18000-7	Air interface at 433 MHz	Mr. C. Harmon	Published as IS on 2004-08-31
18000-7.2	Revision 2 Air Interface Part 7: Parameters for an Active RFID Air Interface Communications at 433 MHz	TBD	CD ballot launched April 2008
24710	Elementary tag	Mr. R. Rees	Published as TR on 2005-10-27

Liaisons

Committee/organisation	from WG 4 to	from .... to WG 4
ISO/IEC JTC 1/SC31/WG 2	Mr. T. Yoshioka	Mr. T. Yoshioka
ISO/IECJTC 1/SC31/WG 3/SG1	Mr. J. Preishuber-Pflügl	Mr. J. Preishuber-Pflügl
ISO/IEC JTC 1/SC31/WG 5	Mr. Kimball	Mrs. M. Harmon
ISO/IEC JTC 1/SC 17/WG 8	Mr. Lazar	Mr. Lazar

Committee/organisation	from WG 4 to	from .... to WG 4
ISO/TC 23/SC 19/WG 3	Mr. S. Halliday	Mr. S. Halliday
ISO/TC 104	Mr. C. Harmon	Mr. C. Harmon
ISO/TC 122	Mr. C. Harmon	Mr. C. Harmon
ISO/TC 204	Mr. B. Williams	Mr. B. Williams
ISO/TC184/SC4	Mr. D. Kimball	
CENELEC TC 106X	Mr. J. Hulshof	Mr. J. Hulshof
CEN/TC 225	Mr. P. Chartier	M. P. Chartier
UPU	Mr. D. Ferguson	Mr. D. Ferguson
GS1	Mr. H. Barthel	Mr. H. Barthel
AIM Global	Mr. Harmon	Mr. D. Mullen
IATA	Mr. P. Chartier	M. P. Chartier
EDItEUR	Mr. Chartier	Mr. B. Green
ETSI/ERM/TG34	Mr. J. Preishuber-Pflügl	Mr. J. Preishuber-Pflügl
ITU-R	Mr. C. Harmon/ Mr. J. Schuermann	
IEEE	Mr. C. Rozeboom	

2.5.5 WG 5

The 8th meeting of Working Group 5 is scheduled to be held on August 13-14, 2008 in Cedar Rapids, Iowa, U.S.A. At that time, the committee will address a newly revised Working Draft for 24730-5 created by an ad hoc committee appointed at the December 2007 meeting.

WG 5 has produced two published standards:

ISO/IEC 24730-1: API, was published in January 2006
ISO/IEC 24730-2: RTLS at 2.4 GHz was published in December 2006

At some point Part 1, the API, will need to be revised to reflect the requirements of 24730-5.

24730 Part 3, RTLS at 433 MHz, as well as Part 4, Global Locating Systems (GLS) suffered from a lack of commitment from the project sponsors, which resulted in no Project Editors to progress the documents. Both projects have been canceled for lack of progress.

Work on Conformance and Performance for the WG 5 RTLS standards was assigned to WG 3/SG 1, and those Technical Reports for 24730-2 are both at the stage of DTR .

2.5.6 WG 6

This is a new work group dealing with mobile item identification and management.

2.5.7 Vocabulary Rapporteur

The Vocabulary Rapporteur published the following standards:

- **ISO/IEC 19762-1:2005,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*
- **ISO/IEC 19762-2:2005,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*
- **ISO/IEC 19762-3:2005,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*

2.5.8 Secretariat

The secretariat has joined the ISO TC server (LiveLink) and retired the SC 31 web system supported by GS1 US. Livelink is now used as the primary data source throughout the work of SC 31.

2.5.9 Other

Nothing to report.

3 Focus Next Work Period

3.1 Deliverables

Summarized, in standard number within WD, CD, FCD, FDIS and IS order, are each of the extant SC 31 work items showing the status each is expected to achieve during the current reporting period (i.e. to May 2007). Precise target dates for each work item can be found at: ***ISO TC Server (SC 31 LiveLink)***.
Set out below are the work items within each Working Group that will be progressed during the coming reporting period (i.e. to May 2009).

3.1.1 WG 1

WG 1 plans to hold its last BRM with its existing documents in May 2008. There has been considerable activity in WG 1 Liaison GS1 regarding the re-naming of some symbologies and some aspects of some symbologies and this activity has lead to the posting of two NPs. Assuming that these NPs pass, it is likely that the work will be assigned to WG1. There are several symbologies being developed through the AIM technical committee which may eventually be proposed as ISO standards. One in particular, called provisionally "Dot Code", has the ability to be printed using high-speed ink jet processes making it suitable for serialization applications.

WG 1 and WG 3 have joint responsibility for OCR standard maintenance. CEN/TC304 published EN14603-2005 which is basically an updated version of ISO 1073-II with the Euro sign added. WG 1 and WG 3 may need to respond to an NP regarding whether 1073-II should remain unchanged or revised either by simply adding an Annex for the Euro character or by updating the entire document.

As required, WG 1 supports the efforts of AIM to maintain the Symbology/Data Carrier Identifiers (SDCI) document. There has been a proposal to add support for the various RFID air interfaces to SDCI.

WG1 plans to hold two meetings in 2008, one in May and one in September and at least one in 2009 before the next Plenary.

WG 1 is fully prepared to take on new work items related to data carriers, as required. In addition, WG 1 stands ready to assist other SC 31 work groups and liaisons with any questions or issues pertaining to data carriers.

3.1.2 WG 2

Proposed future meetings are:

- 4 June 2008 afternoon in Toronto, Canada (during the week of the next SC31 Plenary)
- 5 February 2009 in Shanghai, China (venue to be confirmed) in conjunction with the SC31/WG4 meeting to be held on 4 February 2009.

Future meetings will be held approximately ever six month and ideally in conjunction with other SC31 working groups.

Key work items are the:

- ISO/IEC 15418 30-day default ballot on revision and title change
- ISO/IEC 15459 Part 7 (Product Packaging)
- Technical Report on compatibility between the encoding method to RFID tag (ISO15961) and the bar-code encoding method (ISO15434) to ADC media.
- [Possible] harmonisation between 15459-1 and 15394 via enhanced liaison with ISO TC 122
- [Possible] updates to ISO/IEC 15459 in line with emerging World Customs Authority (WCO) declaration requirements

3.1.3 WG 3

WG 3 has held BRM's for the following standards and they are currently out for ballot.

- 15415 – 2D Print Quality - Technical Corrigendum forwarded to ISO for publication

- 15419 – Digital Imaging & Printing FCD Ballot
- 15421 – Bar Code Masters CD Ballot
- 15423 – Scanner /Decoder- reconfirmation FCD
-
- 15426-2 – Verifier 2D (Spitz) - Technical Corrigendum forwarded to ISO for publication
-
- The following documents are current work items:

Hybrid media ISO/IEC 29133 - Japanese national body has submitted a table of contents outline as a draft of the document. They plan to have a more developed draft before the May WG3 meeting.

-
- Direct Part Marking (DPM) Work Item: SC31 has posted it as a new work item ballot as document SC031-N-2399.

WG 3/SG 1 (RFID conformance) is working on the following:

- IS 18046-1 NWIP approved
- IS 18046-2 NWIP approved
- IS 18046-3 published 2007-09-13
- TR 18047-6 REV BRM DTR scheduled for 2008-05-05
- TR 18047-7 REV PDTR ballot planned after 2008-08-18
- TR 24769 BRM DTR scheduled for 2008-08-18
- TR 24770 BRM DTR scheduled for 2008-08-18

A meeting of WG 3 is scheduled for May 22-23 in Yokohama, Japan. The next meeting is tentatively scheduled for September 17 – 18, 2008.

Meetings of WG3/SG1 are scheduled for August 18th, 2008 in Pittsburgh, PA, USA and for November 10th, 2008 at a t.b.d. place in Europe. New work is expected for the revisions of ISO/IEC 18047-2, -3 and -6 due to revisions in the base standards ISO/IEC 18000-2, -3 and -6.

3.1.4 WG 4

WG4 will continue working on the revision of the 18000 standards to make provision for battery assisted tags and sensor functionalities. At the same time, the standards will be updated with errors that have been identified. New proposals for air interface protocols will be considered.

The 15961 standard will become a four parts standard and make use of a Registration Authority for managing the allocation of data constructs including Application Family Identifiers. WG4 will continue working on work item 24753 and 24791, the Software System Infrastructure.

The technical reports on ISO/IEC 24729 parts 1 and 2 will be published soon and the PDTR ballot of part 3 ends in June 2008.

WG4 has a busy work programme and proposals for new work items can be expected in the future. This can be explained by the growing adoption of the RFID technology, particularly in open supply chain applications, and the concurrent development of innovative products and services.

3.1.5 WG 5

Work will continue on 24730-5, Chirp Spread Spectrum at 2,4 GHz.

There has been interest expressed within the RTLS community to begin standardization of the Ultra Wide Band technology. A presentation was given at the December WG 5 meeting in San Jose, California, with much interest from committee members. To date, no work item has been submitted for UWB.

24730-1 the common API for RTLS will need to be opened at some point to address any changes required in the document as a result of the work on 24730-5.

3.1.6 WG 6

The scope of SC 31/WG 6 is "Standardization of automatic identification and data collection techniques that are anticipated to be connected to wired or wireless networks, including sensor specifications, combining RFID with mobile telephony, and combining optically readable media with mobile telephony. Excluded is the work of JTC 1/SC 31/WG 1, JTC 1/SC 31/WG 4, JTC 1/SC 31/WG 5, JTC 1/SC 6, JTC 1/SC 17, and ISO TC 204."

Liaisons

SC 31/WG 6 seeks liaisons with

JTC 1/SC 31/WG 1	JTC 1/SC 31/WG 2	JTC 1/SC 31/WG 3
JTC 1/SC 31/WG 4	JTC 1/SC 31/WG 5	JTC 1/SC 31/WG 3/SG 1
JTC 1/SC 6	JTC 1/SC 27	✓ ITU-T JCA-NID
✓ ITU-T SG 16	✓ ITU-T SG 17	ITU-R
IEEE	IETF	✓ ETSI
JTC 1/SC 17	ISO TC 204	

3.1.7 Vocabulary Rapporteur

The Vocabulary Rapporteur reports the following standards in process:

- **ISO/IEC FDIS 19762-1,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*
- **ISO/IEC FDIS 19762-2,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 2: Optically readable media (ORM)*
- **ISO/IEC FDIS 19762-3,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*
- **ISO/IEC FDIS 19762-4,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 4: General terms relating to radio communications*
- **ISO/IEC FDIS 19762-5,** *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 5: Locating systems*

The following work is to be done as well:

- WGs are requested to examine new and revised terms and definitions for inclusion in next version of ISO/IEC 19762, expected in 2011
- WG 6 to determine whether new part(s) of 19762 is recommended for mobile devices and sensors
- JTC 1 Vocabulary Maintenance Team creating TERMIUM, an English/French database of IT terms and definitions

3.1.8 Secretariat

The secretariat will focus on improving the use of Livelink by considering the comments on use.

3.1.9 Other

Nothing to report.

3.2 Strategies

- Establish and work to maintain effective liaisons with interested bodies e.g. other standards organizations, committees, trade associations and regulatory bodies with the object of avoiding duplication of work and inconsistent standards, and creating interoperable AIDC technologies.
- Develop system integrity across the different technologies, to ensure sGS1 USessful applications and maximize interoperability, e.g. across the entire supply chain.
- Implement the criteria for standardization (see section 1.4 above) to speed up the completion of standards under development.
- Define consistent data structures (content and syntax) to support the use of AIDC (independent of technology) in handling item identification in a fully compatible manner at all

levels of the global supply chain (from component or individual item through to container and even vehicle) and all stages of the item lifecycle.
- Develop necessary conformance specifications to support the implementation of AIDC technologies.
- Strive to apply consistent principles across the spectrum of AIDC technologies.
- Ensure that AIDC standards are consistent with the global regulatory environment.
- Monitor the development and use of new AIDC technology to be ready to meet the business demand for global standards.
- Use and improve full electronic communication for the members of the SC.
- Encourage National Bodies in their efforts to build a national infrastructure to support global AIDC standardization.
- Ensure JTC 1 long-term business plans are reflected in SC 31 planning.
- Publicize its work programme and delivered standards.
- Reach out to the growing numbers of application groups which are examining or actually designing RFID and RTLS technologies.
- Actively encourage increased participation of users and associations/consortia of users at the working group level.
- Help reduce the financial burden on the committee members associated with travel and the time away from home/work by sequentially scheduling related meetings to fill one, but not more than one week.
- Encourage the use of teleconferencing technology whenever practical. Support the use of teleconference meetings when committee work can be accomplished without the need for "face to face" meetings. Support teleconferencing to augment participation at face to face meetings.
- Ensure that work groups and sub groups utilize repeatable documented procedures and processes to develop their products.

3.2.1 Risks

There is a not inconsiderable risk that there will be a proliferation of incompatible de facto and even formal AIDC application standards even after ISO standards are in place, which we hope will reduce as our liaison relationships become effective, and the programme of work is fulfilled. This emphasizes the need for continuing work to ensure that liaisons are effective and not merely nominal, together with the need to disseminate news of the coverage and progress of SC 31 output, in order to reduce the opportunity for other groups, both in and outside the ISO and JTC 1 arena, either to ignore the existence of applicable AIDC standards or to seek to plough an independent furrow for no good reason. However, mechanisms are being used to reduce the possibility of incompatibility where potential conflicts exist. The sub-committee needs to monitor activities in other fora in order to minimize the risk of being taken unawares, and maximize the opportunity for constructive input to these groups.

SC 31 tracks market developments through its comprehensive cover of the market place afforded by the wide range of experts that actively support the SC 31 work programme and through that intelligence endeavors to react in a timely fashion to perceived market needs.

3.2.2 Patents

SC 31 continues to be concerned that IPR issues will cause problems in the future and was disappointed that the new ISO Directives have not addressed the issues raised by SC17, Japan and others. SC 31 urges JTC 1 to listen to the concerns of its subcommittees and along with ISO seek a workable solution once and for all.

3.3 Opportunities

3.3.1 WG 1

SC 31 and EPCglobal must escalate their efforts to insure the work products of the two groups are compatible. There is nothing inherently inconsistent with a user-dominated group producing standards to meet their needs and a vendor-driven group that is concerned with technical rigor. There is already the model of WG 1 data carrier specifications which are developed in the user-space but which are published in a vendor-supported engineering-centric manner. This is a win-win model. It is

not consistent with the SC 31 mandate to have incompatible standards that overlap its program of work.

The clauses of several 2D symbology standards (ISO/IEC 15438, ISO/IEC 16022, ISO/IEC 16023, ISO/IEC 24778) establishing Reed-Solomon error correction requirements, contain references to sources from the Bibliography section:

- Richard E. Blahut, “Theory and Practice of Error Control Codes,” Addison-Wesley, 1983-4,
- Lin and Costello, “Error Control Coding: Fundamentals and Applications,” Prentice Hall, 1983,
- C. Britton Rorbaugh, “Error Coding Cookbook,” McGraw Hill, 1996

It is expedient to consider mentioning possible development of a single standard establishing uniform requirements for Reed-Solomon error correction for all 2D symbologies.

Some standards for 2D symbologies (ISO/IEC 15438, ISO/IEC 16022, ISO/IEC 16023, ISO/IEC 24778) contain references to AIM Inc. ITS/04-001 «Extended Channel Interpretations Part 1: Identification Schemes and Protocol» and «Extended Channel Interpretations - Part 2: Registration of coded character sets and other data formats».

It is expedient to consider mentioning possible development of a standard on Extended Channel Interpretations based on AIM Inc. International Technical Specifications.

3.3.2 WG 2

WG 2 has a busy work program and new work items can be expected as the core Data Structure standards of SC31 are deployed in linear bar codes, 2-D bar codes and RFID tags and interoperability issues arise. WG2 standards – particular ISO/IEC 15459 unique identifiers – are also being considered as a basis for developing World Customs Organisation (WCO) requirements for import/export declarations and transport item and consignment identification.

Different parts of ISO/IEC 15459 contain the requirements for unique identification for transport units, Individual and returnable transport items, product groupings and product packaging for supply chain management. However they do not consider the unique identification of documents used in supply chain.

It is recommended to consider possible development of a separate part of ISO/IEC 15459 establishing the types of documents used for supply chain management, and global approaches to the unique identification of these documents.

3.3.3 WG 3

No Comment

3.3.4 WG 4

WG4 has identified the need to better coordinate its activities with EPCglobal and to manage the liaison in a more efficient way. A specific process has been put in place to address this issue. There is an opportunity of reducing the duplication of work by sharing knowledge and expertise.

3.3.5 WG 5

No comment.

3.3.6 WG 6

No comment.

3.3.7 Vocabulary Rapporteur

No comment.

3.3.8 Secretariat

The JTC 1/SC 31 Programme of Work does not allow to correlate all stages/substages of the development of International Standards with Business Plan Periods. Livelink could provide a visual

method in showing the above correlation besides the current status report mechanism. See Appendix A.

3.3.9 Other

The healthcare industry requires general application standards for the automatic identification of medical documents, products of blood transfusion, in vitro diagnostic test systems, etc.
Some ISO Technical committees dealing with healthcare (see table below) have published a number of specific standards on identification, labeling, marking and traceability. However, there are no application standards in the healthcare area on AIDC techniques and there is no joint working group on AIDC standardization serving the ISO TCs dealing with healthcare.

ISO TC	Scope
TC 76 Transfusion, infusion and injection equipment for medical and pharmaceutical use	Standardization of transfusion, infusion and injection equipment for medical and pharmaceutical use; terms and definitions for such equipment; specifications for quality and performance of materials and components. Standardization of containers (such as infusion bottles, injection vials, ampoules, glass cylinders, cartridges, prefillable syringes, etc.) and devices (such as giving sets, blood collecting tubes, etc.) as well as pertinent primary and secondary packaging and functional components (such as elastomeric closures, caps, pipettes and accessories) for medical and pharmaceutical use
TC 84 Devices for administration of medicinal products and intravascular catheters	Standardization of the performance of metered devices and supplies intended for administration of medicinal products, and standardization of syringes, needles, and intravascular catheters.
TC 106 Dentistry	Standardization of terminology, methods of test and specifications applicable to materials, instruments, appliances and equipment used in all branches of dentistry.
TC 121 Anaesthetic and respiratory equipment	Standardization of anaesthetic and respiratory equipment and supplies, related devices and supply systems.
TC 150 Implants for surgery	Standardization in the field of implants for surgery 1) and their requiredinstrumentation, covering terminology, specifications andmethods of tests for all types of implants, and for thematerials both basic and composite used in their manufactureand application.
TC 170 Surgical instruments	Standardization in the field of surgical instruments such as forceps, scissors, scalpels and retractors.
TC 194 Biological evaluation of medical devices	Standardization of the approach to biological evaluation of medical and dental materials and devices together with standardization of biological test methods applicable to those materials and devices.
TC 210 Quality management and corresponding general aspects for medical devices	Standardization of requirements and guidance in the field of quality management and corresponding general aspects for medical devices. Standards for small bore connectors.
TC 212 - Clinical laboratory testing and in vitro diagnostic test systems	Standardization and guidance in the field of laboratory medicine and in vitro diagnostic test systems. This includes, for example, quality management, pre- and post-analytical procedures, analytical performance, laboratory safety, reference systems and quality assurance.
TC 215 Health informatics	Standardization in the field of information for health, and Health Information and Communications Technology (ICT) to achieve compatibility and interoperability between independent systems. Also, to ensure compatibility of data for comparative statistical purposes (e.g. classifications), and to reduce duplication of effort and redundancies.

3.4 Work Programme Priorities

The initial priority for SC 31 work was to provide a good base of international standards covering bar codes. These standards are needed to support global commerce. This work is almost complete; indeed many of the standards are now approaching their five-year review. The second priority has been to identify and standardize important elements of RFID and work is focusing on these technologies. RFID is of high commercial interest and is rapidly increasing its market penetration. A third, but lower, priority for SC 31 will be the development of standards for other AIDC technologies.

3.5 Public Relations Initiative

In line with JTC 1 policy, SC 31 will increase its efforts to communicate with the standards bodies and general public about important events through postings with the JTC 1 Secretariat (on its 'What's New' page), issuing press releases, the launch of a Newsletter, and use of its own Web pages to highlight accomplishments.

Since 1998, SC 31 has maintained a web site (http://isotc.iso.org/livelink/livelink?func=ll&objId=327946&objAction=browse&sort=name) to provide complete information on the progress of standardization of its projects. Work will be done during the year to ensure the information is kept current. One of the Working Groups has established its own web site to keep its members current on its work. Currently, WG 4's document repository is linked to the main SC 31 site.

As noted above the functionality is being transferred to the ISO TC Server in the near future. SC 31 expresses its appreciation to GS1 US for its support.

This work is of primary importance and needs to be improved for the coming year. Effective communications and better responsiveness to communications are vital needs to which we must devote efforts during the period. The web site is a key feature in this.

3.6 Liaisons

Although the Subcommittee has a very healthy slate of liaison activities, it is becoming apparent that we need to identify new ones. This is especially true in the areas of Location activity and Security in both bar code and RFID. In line with the JTC 1 initiative on Privacy, this committee needs to develop liaisons to help understand how the technologies we are standardizing are impacting the privacy issue.

JTC 1/SC 31 Liaisons

Two major international organizations, GS1 and AIM, Inc. have been active in coordinating AIDC technology and its use for many years. Both organizations are very closely involved in supporting SC 31. A high proportion of the SC 31 delegates are also members of these organizations.

The focus of SC 31 on multi-industry solutions necessitates liaison with many application oriented standards groups. The lists above are expected to grow as SC 31 progresses its work. While the avoidance of duplication and overlap is a major objective of these liaisons, additional objectives include the gathering of user requirements and consultation on how SC 31 standards might be employed to address industry problems, and may, in some cases, involve joint work on projects of mutual interest. Several examples during the period since the last Plenary have demonstrated the need for this approach and the benefits to all parties of cooperation rather than competition.

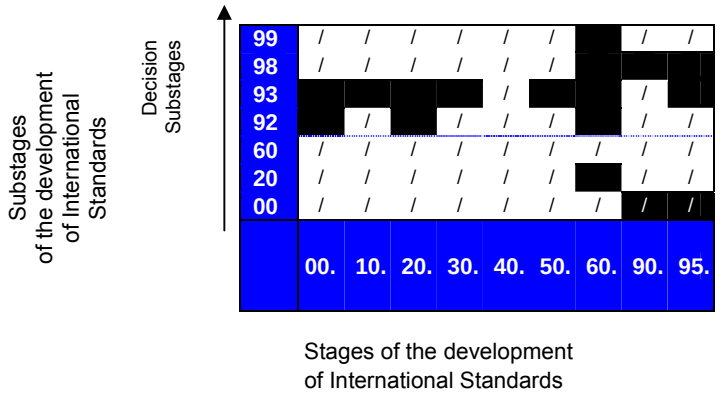
A new relationship between SC 31 and ISO TC 184/SC 4 has been established on a trial basis. An ad hoc working group has been established in lieu of a Joint Working Group. The purpose of this ad hoc is to pursue adoption and incorporation of the SC 31 technical standards into ISO 10303 and its supporting application protocols. This effort was deemed necessary when industrial standards which did not utilize the SC 31 technical standards were proposed for adoption by TC 184.

Before the creation of SC 31, standardization in the AIDC field was carried out at the national and regional levels. The principal regional organization involved in AIDC standardization, CEN TC 225, is cooperating completely with SC 31. Its remit has now been broadened to cover the same ground as SC 31. Much of the work which CEN TC 225 has completed is now in process of being adopted as

SC 31 standards, and in turn many SC 31 standards are being adopted by CEN to supplement or replace European standards. The National Bodies that had been working on AIDC standardization at those levels are also involved in supporting SC 31 standardization efforts as members.

The National Bodies that had been working on AIDC standardization at those levels are also involved in supporting SC 31 standardization efforts as members. The ISO/IEC documents resulting may be transcribed to National Standards, or more frequently simply adopted as is.

Appendix A Matrix of International Standards development sub-stages



The dates of substages in cells (format **MM/YY)** include:
- beginning of the current or future substage (*italic*) (for example May 2010 – *05/10*) or
- end of the completed substage (**bold)** (for example June 2009 – **06/09**)

Black cells designate non-existing stages

The cells connected to the relevant Business Plan period should have the same color

Examples of use of colors

- Business Plan Periods before June 2007
- Business Plan Period for June 2007 to June 2008
- Current substage
- Business Plan Period for 2008 - 2009
- Business Plan Period for 2009 - 2010
- Business Plan Period for 2010 - 2011
- Substage does not exist
- Left out substage

Examples of use of the matrix

(information in cells is for demonstration purposes only)

Project ref.	Project title	Stage/Substage	Documents
ISO/IEC CD 15459-7 (id 51201)	Information technology -- Unique identification -- Part 7: Unique identification of product packaging	99 M/Y M/Y M/Y M/Y M/Y M/Y / / 98 / / / / / / / / 93 / / / / / / / 92 / / / / / / / 60 M/Y M/Y M/Y M/Y M/Y M/Y M/Y / / 20 M/Y M/Y 01/08 01/08 M/Y M/Y / / 00 M/Y M/Y 12/07 12/07 M/Y M/Y M/Y / / 00. 10. 20. 30. 40. 50. 60. 90. 95.	…… …… 20.20 – SC031-N-2419 30.20 – SC031-N-2421
ISO/IEC FCD 15420.2 *(id 46143)*	Information technology -- Automatic identification and data capture techniques -- Bar code symbology specification -- EAN/UPC (Revision of ISO/IEC 15420:2000)	99 / M/Y / 09/07 M/Y M/Y / / 98 / / / / / / / / 93 / / / / / / / 92 / / / / / / / 60 / / / 08/07 M/Y M/Y M/Y / / 20 / / / M/Y 05/08 M/Y / / 00 / / / M/Y 01/08 M/Y M/Y / / 00. 10. 20. 30. 40. 50. 60. 90. 95.	…… 10.99 – SC031-N-XXXX 30.00 – SC031-N-XXXX 30.20 – SC031-N-XXXX 30.99 – SC031-N-XXXX 40.00 – SC031-N-XXXX
ISO/IEC CD 24753 *(id 51144) (WG 4)*	Automatic identification and data capture techniques -- Radio frequency identification (RFID) for item management -- Application protocol: encoding and processing rules for sensors and batteries	99 M/Y M/Y 04/05 M/Y M/Y M/Y / / 98 / / / / / / / / 93 / / / / / / / 92 / / / / / M/Y / / 60 M/Y M/Y M/Y 01/07 M/Y M/Y M/Y / / 20 M/Y M/Y M/Y 07/07 M/Y M/Y / / 00 M/Y M/Y M/Y 01/06 M/Y M/Y M/Y / / 00. 10. 20. 30. 40. 50. 60. 90. 95.	…… 20.99 – SC031-N-XXXX 30.00 – SC031-N-XXXX 30.20 – SC031-N-XXXX 30.60 – SC031-N-XXXX