RFID for a world on the move

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Coming Up

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RFID has a long history. It dates back to World War II when transponders were used to identify aircraft, “identify friend or foe” (IFF). Though still in use today, the technology is far from its original designs. Today, RFID exists in several frequency bands for many different applications, each with its own characteristics.

The use of RFID has seen a major kick start in the last 10 years enabling more applications than simple access control. In particular, the growth in the supply chain has highlighted the need for numerous applications. Although RFID standards encompass many different frequency bands, the main success for the technology has come from three areas: ticketing, payment systems and supply chain tracking.

The traditional use of high frequency (HF) devices has exploded with the adoption of the technology for item identification. This has been especially noticeable in the areas of ticketing and payment infrastructure. The largest user of this technology, for example, comes from HF RFID on train, bus, and event tickets. Systems such as the Oyster card in the United Kingdom, have been adopted with great success, improving the flow of passengers on the rail system. As of 2007, over 10 million Oyster cards have been issued. Another example is the Octopus card in Hong Kong, China, with over 20 million cards issued.

The acceptance of RFID by payment systems and the development of ISO/IEC 14443 for proximity cards and near field communications (NFC) tags have led to the growth in payment systems using RFID type cards. Visa’s payWave and MasterCard’s PayPass, which are being used by many stores, are well-known examples of contactless payment systems. This is expected to lead to the acceptance of handheld devices, such as smartphones enabled with RFID, to replace the credit/debit cards currently on the market, moving even further towards a cashless society.

The development of RFID in the ultra high frequency (UHF) bands offers a technology with the capability of a barcode, but without the limitations. The tags can be read without line of sight, over distances of several metres (two – five is easily possible), and with the capability of changing the data, or adding sensors (to the tags) to monitor temperature, pressure etc. The mandates from Wal-Mart and the US Department of Defence requiring their suppliers to apply RFID labels to all shipments have increased the take up of the technology. The underlying driver for adoption has been the availability of standards.

RFID technology’s capabilities range from reading a simple ID number at a few centimetres, to storing the complete inventory of a container, allowing it to be read at a distance approaching 100 metres. This broad range in capabilities has meant that dissemination of RFID has increased in leaps and bounds.

Initial concerns about privacy seem to have been largely addressed. The technology to manufacture both tags and readers has taken giant steps forward and the reliability, price, and availability of the technology makes commercial use a reality. The return on investment (ROI) of RFID has fallen to between 6 to 12 months, with more and more applications under six months. ROI is at a level now where it makes sense to use the technology.

RFID has come of age. The range of applications using the technology range from asset tracking to mobile payments. The days when RFID was only used as a standalone access control card to get into the office are long gone. We are now looking at RFID applications that enable the complete supply chain across the globe.

This ISO Focus+ issue takes a snapshot of the technology’s capabilities today. There are many new applications being explored, from document management to monitoring trees, to tracking bicycles, to monitoring gaming chips in casinos to tracking and inventorying ISO containers as they move around the world. The possibilities are endless…

Steve Halliday
Chair, ISO/IEC JTC 1/SC 31/WG 4/SG 3, RFID air interfaces
Fully Networked Car 2010

This year’s Fully Networked Car workshop organized by the World Standards Cooperation (WSC), a partnership between ISO, IEC and ITU, was held in March at the Geneva International Motor Show 2010.

The workshop brought together key players in standardization to present their perspectives and strategies on the current and future role of information and communication technologies (ICT) in motor vehicles, in particular for electric cars.

Better service at hotels and restaurants

ISO Secretary-General Rob Steele attended the 47th General Assembly of the International Hotel and Restaurant Association (IHRRA), held in Belgrade, Serbia, in January 2010.

He spoke about the work of ISO/TC 228, *Tourism and related services*, of which IHRRA is a liaison organization. The committee develops standards for improved and safer services in the tourism industry. Its areas of work currently include recreation services, health tourism, tourist information, golf services, beaches, natural protected areas and adventure tourism.

“ISO/TC 228 aims to create transparency in the exchange of tourism products and services and raise consumer’s confidence. It supports fair competition, sustainable and ethical practices, safety and security, and much more,” said Mr. Steele. “Its work should help developing countries, many of which rely principally on tourism, to better promote themselves.”

Mr. Steele also looked at other ISO standards contributing to tourism. Some of these include work on public information symbols, food safety, fire safety, quality management, service activities for water systems, traffic and travel information, event sustainability and carbon footprints, among many others.

Private and public food safety efforts

The shared accountability of governments and companies for food safety was the theme of a panel session at the Global Food Safety Conference organized in Washington D.C., USA, in February 2010, by the Consumer Goods Forum.

Focusing on the interaction between public and private food standards, the session included representatives from ISO, the Codex Alimentarius, the World Trade Organization and academia.

ISO Deputy Secretary-General Kevin McKinley (see photo above right) spoke on ISO’s contribution, “ISO can help provide a bridge between industry approaches and the expectations of governments.” He explained how ISO’s international multi-stakeholder standards can complement public policies, and in many sectors, provide a basis for technical regulations, but themselves do not set public policies.

Mr. McKinley called for new ways to improve efficiency and confidence in food safety implementations, rather than debate past approaches. In food safety, key contributions from ISO include the well-known ISO 22000 food safety management series, as well as the work of ISO’s Committee on conformity assessment (ISO/CASCO) which develops the international benchmark standards for such activities as testing, certification, accreditation and inspection.

Metrology at the nanoscale

A workshop on metrology at the nanoscale, held in February 2010, in Paris, France, and organized by BIPM, brought together representatives from national metrology institutes (NMIs) with other stakeholders, such as nanomaterial manufacturers, regulation authorities and standardization bodies involved in nanotechnologies.

Nanotechnologies are developing rapidly, and associated documentary standards and regulations are being adopted at national and international levels. There is increasing pressure on metrologists to develop reliable and accurate measurement techniques and methods to underpin this. International coordination among NMIs is required, with new approaches to overcome the complexity of this area caused by its highly multidisciplinary nature.

At the workshop, Dr. Peter Hatto, Chair of ISO/TC 229, *Nanotechnologies*, commented: “The role of ISO/TC 229 is to provide horizontal standards in critical areas to support stakeholders, including industry, regulators, other technical committees to help ensure the safe and responsible development of nanotechnologies.”

The growth of, and interest in, ISO/TC 229 has created a need for the committee to maintain a nanotechnologies liaison coordination group to help ensure effective and active communication between technical committees and other organizations with a direct interest in nanotechnology standardization. Currently, ISO/TC 229 has 32 organizations in liaisons, in addition to the 43 member countries participating in, or observing, its work.
Edouard Dayan has been Director General of the UPU International Bureau since January 2005. He was re-elected by acclamation in August 2008 at the Geneva Congress.

Under his leadership, the UPU has focused efforts on strengthening its relations with the UN and international organizations, defining the postal sector’s role in the information society, promoting the need and development for International Standards to improve the quality of postal services worldwide, maintaining the pace of technological innovation, and using a regional approach to promote postal reform and close the development gap.

Before taking over as Director General, Edouard Dayan held various positions of a strategic, regulatory, commercial and operational nature at the French, European and international levels during a career spanning over 30 years.

Edouard Dayan is a Knight of the National Order of Merit and Knight of the Order of the Legion of Honour (France).

*ISO Focus+:* Within the globalization and liberalization of trade, supported by global supply chains and the development of the Internet, the delivery of postal services has considerably improved during the last few years. How do International Standards help postal service providers stay competitive in a market that is constantly evolving? To what extent do standards contribute to improving quality?

*Edouard Dayan:* The international postal service is based on a global postal supply chain. To be competitive, the postal supply chain must be fast and smart. The need for an efficient, interoperable supply chain forces all participants to adopt common standards. These standards eliminate friction at borders, and, combined with
already exist. The UPU wants to have a voice in the future evolution of these standards. The UPU is also applying new technology such as radio frequency identification (RFID) to core postal services, and needs to stay abreast of developments in RFID standards.

Work addressed by ISO and the UPU is also complementary. For example, participating in ISO technical committee ISO/TC 211, Geographic information/Geomatics, ensures coordination in this area.

By participating in the ISO standards process, the UPU has a voice in the development and evolution of ISO standards that impact the post office. Moreover, this ensures better coordination.

ISO Focus+: The UPU plays an active role in ISO contributing to eight technical committees including information technology, paper, board and pulps, freight containers, terminology, packaging, geographic information, processes, information and documentation. Why does the UPU participate in the ISO standards process? What, in your view, are the concrete benefits of participation? How do ISO standards complement those developed by the UPU?

Edouard Dayan: As part of its global business strategy, the UPU is diversifying into non-traditional areas such as financial services and e-commerce. These are areas in which non-postal actors have already been active, and in which standards other UPU initiatives, help make the supply chain more visible. We are moving towards our ultimate goal – paperless operations and accounting.

ISO Focus+: A cooperation agreement (memorandum of understanding) signed in 2008 between the UPU and ISO ensures that postal services increasingly benefit from globally relevant International Standards developed by ISO. What do you expect from this collaboration? Can you provide some examples of the fruitful cooperation? In what other areas would you like to see ISO International Standards?

Edouard Dayan: Our cooperation agreement allows seamless collaboration between the two organizations. Concrete benefits for the UPU include liaison with ISO technical committee ISO/TC 211, Geographic information/Geomatics, and ISO technical committee ISO/TC 68, Financial services, working group WG 4, Management of ISO 20022. Our addressing experts participate in the first, while our financial experts contribute to the second.

We would like to see ISO standards in the area of e-commerce. This is an area where many national postal services are active as deliverers of merchandise, bought online or as providers of other logistics services for e-companies.

ISO Focus+: E-commerce has revolutionized postal services, contributing to faster and easier delivery. How are International Standards facilitating this evolution?

Edouard Dayan: E-commerce growth has been good for national postal operators, often the carrier of choice for last-mile delivery of parcels and packets to the consumer. Also, postal operators already provide a wide range of financial services, from remittances to banking services. Now postal operators are offering secure and trusted payment services for e-commerce transactions.

E-commerce, along with financial services, is a priority for us. We are focusing on parcels and packages because the efficient delivery of e-commerce hinges on a totally reliable parcel service. Our customers want the ability to track what they have posted. Developing such a system that works all over the world is another of our strategic objectives. And interoperability is one of the three pillars of the world postal strategy our 191 member countries have adopted at our 2008 Congress in Geneva, Switzerland.

Globalization and growing economic integration are possible only with standards.
So I see standards as becoming even more important for us in the future.

ISO Focus+: Can you please comment on how ISO standards for bar code technology and RFID provide added value?

Edouard Dayan: The UPU is implementing an RFID-based Global Monitoring System (GMS). The technology used is based on ISO standards. Whether we remain competitive, or not, depends on the quality of service that we offer our clients. The GMS is the key tool to monitor quality of service, and is thus a very strategic initiative. We have worked on this project for the past few years, promoting innovation and competition among RFID suppliers to ensure the lowest prices for this technology, and access to it by all our member countries.

Barcodes are another fundamental building block of the postal service. They are used on all items that need to be tracked, and today, barcodes give them the unique identity necessary to track them.

ISO Focus+: Postal authorities are increasingly providing financial services to meet the needs of their stakeholders. What is your view on ISO 20022 for improving communication between financial industry players? How would you like to see the UPU’s involvement in ISO’s technical committee for financial services (c.f. ISO/TC 68)?

Edouard Dayan: Many postal services have traditionally offered financial services to the public – practically everyone has an account in a post office, and everybody knows what a money order is. Postal services have been in the business of transferring money for generations.

With the advent of technology, however, post offices, too, are getting involved with electronic funds transfer. Paper money orders are being transformed into electronic money orders. We have the obligation to provide a low-cost means of funds transfer to the public.

Given our vast network of post offices – a network that no bank or company can match – we are uniquely placed to provide this service at very competitive prices. Financial services are a very important part of our business strategy because we see them as providing a growing share of our revenues in the future.

And since electronic funds transfer is based on ISO 20022 (universal financial industry message scheme), this standard is of fundamental importance to us as well. We have been granted liaison status with ISO/TC 68/WG 4 dealing with ISO 20022, and we look forward to participating in the work of this group.

ISO Focus+: Several postal administrations have shown reduced revenues resulting from e-commerce proliferation. Does the UPU plan to introduce new services to offset the reduced revenue in letter mail? Does the UPU plan to focus more on small package services? What role will standards play in UPU’s future?

Edouard Dayan: As electronic communication evolves, postal operators and the UPU are not just standing by the sidelines. Operators are exploiting the opportunities the Internet provides to generate new revenue streams and offset the drop in letter-post volumes.

Hybrid mail, for example, has been around for years. The service enables large-volume mailers to send bills, statements and advertising letters by giving their data files to the postal operator, who then routes the data to appropriate locations for printing and mailing. It is a fast, cost effective and an environmentally friendly way for letters to be...
sent. The UPU is studying the benefits of developing International Standards to facilitate cross-border hybrid mail exchanges.

In terms of trust-based services, there are still many problems with trust and security of Internet communications and Internet-based transactions. We are looking at developing new electronic postal services to address some of these issues. Examples include the postal registered email (PREM), electronic postal certification mark (EPCM) and pilot UPU certification authority.

The UPU Standards Board has approved standards development activities for each of these. The UPU Postal Technology Centre is providing development and deployment support for affordable access to technologies for these services.

Additionally, the UPU has recently obtained an Internet top-level domain called .post (dot-post) to provide a platform for secure and trusted domestic and cross-border postal services, enhancing the possibilities for increased trust in e-commerce transactions in all countries.

The UPU is the first UN agency to enter such a contract with the Internet Corporation for Assigned Names and Numbers to oversee a top-level domain. The contract is an important contribution to the further development of the Internet, especially in underserved areas.

It is part of a goal to provide a single interoperable network linking physical and electronic postal services to enhance inclusion of all people around the globe in the information society. The development of .post will be founded on policies and standards developed within the UPU working groups, one of which is the UPU Standards Board for technical standards.

Finally, the UPU is looking at how it can contribute to solving the growing problem of illegal and counterfeit items originating from the e-commerce marketplace. The UPU believes that International Standards, enhanced technical infrastructure and industry policies, should be developed in cooperation with all stakeholders in the global supply chain. This cooperation should include customs, airlines, law enforcement, postal operators and e-commerce merchants with a stake in this critical issue.

With so many projects underway, you can understand why standards will be very important for us in future.

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UPU at a glance

Established in 1874, the Universal Postal Union (UPU) with its Headquarters in Berne, Switzerland, is the primary forum for cooperation between postal-sector players. It helps to ensure a truly universal network of up-to-date products and services.

With 191 member countries, this specialized agency of the United Nations fulfills an advisory, mediating and liaison role, and renders technical assistance where needed. It sets the rules for international mail exchanges and makes recommendations to stimulate growth in mail volumes and to improve the quality of service for customers.

As a non-political organization, it does not interfere in matters that fall within the domestic domain of national postal services. For example, posts set their own postage rates, decide which and how many postage stamps to issue, and how to manage their postal operations and staff.

The UPU’s objective is to develop social, cultural and commercial communication between people through the efficient operation of the postal service. As an intergovernmental institution, the UPU is called upon to play an important leadership role in promoting the continued revitalization of postal services.
The integrated use of management system standards.

Organizations face multiple challenges. Quality and environmental management, information security, food safety, supply chain security and occupational health and safety among others. More and more are turning to management system standards (MSS) to help them meet such challenges efficiently and effectively. The combined book and CD, *The integrated use of management system standards*, explains how to integrate the required elements of different standards within the organization’s overall management system. Based on the practical experience of organizations large and small, the book identifies methodologies, tools and good practice. An investment of only 50 Swiss francs.

Available from ISO national member institutes (listed with contact details on the ISO Web site at [www.iso.org](http://www.iso.org)) and from the ISO Central Secretariat Webstore at [www.iso.org/isostore](http://www.iso.org/isostore) or e-mail to [sales@iso.org](mailto:sales@iso.org).


International Organization for Standardization – [www.iso.org](http://www.iso.org)
RFID standards
A diversity of applications

by Sandrine Tranchard

Shipping freight around the world? Borrowing a book from the library? Swiping your identification badge at the office? Driving on a highway with an eToll? Opening your car with a long-range access control? Keeping track of your pet?

A radio frequency identification (RFID) system tracks moving objects. It enables data to be transmitted by a mobile device or tag, which is read by an RFID reader and processed according to the needs of a particular application. The transmitted data may provide identification or location information, or specifics about the tagged product, like price, colour or date of purchase.

The RFID market has seen a major kick start in the last 10 years. And its applications are constantly expanding. A recent report from the Electronic Communications Committees (EEC) estimates the future market size for RFID to be USD 27.59 billion.

Today, RFID applications span the entire supply chain, some of which are highlighted in this issue of ISO Focus+. For example, the use of RFID tags on products, packaging, freight containers, transport units and returnable transport items facilitates tracking of goods and their management, allowing inventory control, in-transit visibility and loss prevention.

Another use of RFID tags is seen on farms for tracing livestock throughout their lifetime to control, for example, diseases and ensure product quality. In addition, they are also commonly used for identifying pets or tracking animals in the wild.

This month’s Special Report showcases the diversity of ISO standards for RFID and the benefits of their use, from facilitating the circulation of books in libraries and improving the traceability of gas cylinders to identifying animals, and tracking cargo shipment.

More importantly, ISO standards provide a harmonized framework, improve transparency, efficiency and safety in a complex, but growing market, while optimizing business processes and reducing operational costs for companies.

With so many areas of RFID in our daily lives, the industry has to deal with other matters, such as security and privacy. Here again, the development of ISO standards will no doubt be an important part of the solution.

Sandrine Tranchard is Communication Officer at the ISO Central Secretariat.
Radio frequency identification (RFID) is a relatively simple concept involving the combination of a wireless communications technique using radio frequencies with a unique identifier embedded within the wireless communications. The International Telecommunications Union Radiocommunications Sector (ITU-R) defines RFID as a “short-range device” subject to the rules imposed on such devices. The many ISO standards addressing RFID applications (see Box on page 11) show that RFID is of significant interest to the international community.

A typical configuration

All RFID systems have an interrogator, two antennas, and one or more radio frequency (RF) tags, as shown in Figure 1 (below).

Multiple interrogators may be incorporated in locating systems. The signal emitted by a tag is received by each of the interrogators. The location of the emitting tag can be determined based upon the time it takes the signal to reach each of the interrogators or by the strength of the signal received at each interrogator.

Active versus passive systems

RFID systems are said to be either “active” or “passive”. Active systems actually generate a signal. Passive systems receive an incoming radio wave, modulate the inbound wave according to the data content of the RF tag, and return the modulated signal. This is often referred to as reflecting and modulating the incoming signal.

With current technology, active systems incorporate a battery, while most passive systems do not. In the future, it will be possible to harvest sufficient energy from the environment around an RF tag to generate a signal. The active tag would remove the need for a battery. Some passive systems currently incorporate a battery to enable greater range and on-board tag functions. Battery-assisted passive devices also commonly support sensors.

Passive systems require significantly higher power to:

• Traverse the space between the interrogator and the tag
• Provide enough power to drive the circuitry that modulates and reflects the signal
• Traverse the return space between the tag and the interrogator.

In an active system, power loss is caused only by the space from the tag to the interrogator. Typically, the output power of active tags is measured in MilliWatts and the output power for passive system interrogators is measured in Watts.

Active systems can generally transmit over distances from tens to hundreds of metres, while passive systems can communicate over distances of only a few centimetres to a few metres. The principal drawback with active or battery-assisted passive systems is the time and cost of battery maintenance with currently available active RF tags.

The signals from passive RF interrogators or active RF tags operate in specific parts of the electro-magnetic spectrum. These frequencies are categorized as low frequency, in the range of 30 to 300 Kilohertz (kHz), high frequency of 3 to 30 Megahertz (MHz), or ultra high frequency of 300 MHz to 3 Gigahertz (GHz).

To avoid licensing requirements in publicly regulated frequency bands, the popular RFID bands are industrial, scientific, and medical (ISM) bands, including 13.56 MHz, 433 MHz, 860-960 MHz, and 2.45 GHz. National radio regulations determine the maximum power level permitted at these frequencies, as well as other characteristics of the transmission such as the length of time a transmitter can be turned on before it must be turned off (known as the duty cycle).

Types of standards

Several different types of standards are required for RFID to be successful in the marketplace, including:
Who is working on RFID?

Radio-frequency identification (RFID) is addressed in the work of several ISO committees, including ISO/IEC JTC 1:

- ISO/IEC JTC 1/SC 31, as an automatic identification and data capture (AIDC) technique to identify and locate physical objects
- ISO/IEC JTC 1/SC 6, as an identification and communications technique to identify physical objects in identity transactions
- ISO/TC 104, as an AIDC technique to identify shipping containers (as opposed to the cargo within the container)
- ISO/TC 204, to enable intelligent transportation systems
- ISO/TC 207, to facilitate anti-counterfeiting
- Universal Postal Union (UPU) to identify postal items (see the Guest Interview on page 3)
- International Air Transport Association (IATA) to identify baggage and passengers.

RFID is also significant in the work of:

- ISO/IEC/JTC 1/SC 27, applying the security techniques within SC 27 to RFID
- ISO/IEC/JTC 1/SC 27/WG 5 and ITU-T SG 17, addressing privacy in accordance with the ISO TMB Privacy Steering Committee
- ISO/IEC/JTC 1/WG 7, in the area of sensor networks.

- Technical standards, such as the air interface standards of the ISO/IEC 18000 series, ISO/IEC 15693 and ISO/IEC 14443
- Data standards, such as ISO/IEC 15963 for tag identification, ISO/IEC 15418 for data identifiers and application identifiers, the ISO/IEC 7816 series for inter-industry data elements and ISO/IEC 15434 for syntax
- Conformance standards, to enable interoperability between the products of various manufacturers, such as the ISO/IEC 18047 series and the ISO/IEC 10373 series
- Application standards, such as the ISO 1736x series, ISO 10374, ISO/TS 10891, and IATA 1740c
- Network standards, such as ITU-T Recommendation F.771, X.550, X.660, and Y.2213.

Unresolved issues

The use of the industrial, scientific and medical bands for RFID is currently topic of some contention within the ITU. Several countries contend that ITU radio regulations clearly state that the ISM bands should not be used for radio communication and that RFID is radio communications. Resolution of this issue is expected at the World Radio Conference in 2012 (WRC-12).

Privacy advocates argue that RFID may constitute a threat to personal privacy by enabling the tracking of individual purchases. This concern has led to a push for regulations requiring that RFID tags be permanently deactivated once the item to which the tag is attached has been purchased. This would deny post-sales applications such as warranty tracking, returned goods and recalls. The recently formed ISO Technical Management Board Privacy Steering Committee is expected to address this topic in 2010 and 2011.

A second public policy issue associated with RFID is the safety of RF devices. Low frequency and some high frequency devices have been found to cause electro-magnetic interference with implantable cardioverter-defibrillators and implantable cardiac pacemakers in a laboratory setting. No occurrence of an RFID system causing a problem with such devices implanted in a human being has ever been reported.

Nonetheless, the RFID Experts Group (REG), in cooperation with the US Food and Drug Administration, Georgia Tech Research Institute, MET Labs, and the University of Hokkaido, is establishing test protocols that will ultimately ensure that RF emitters do not have an adverse effect on implantable devices, clinical equipment, or biologics. This work is expected to conclude in 2011.

Further harmonization is needed among ISO committees (as well as within ITU), which often deal with similar issues. An example is ISO 17363, Supply chain applications of RFID – Freight containers, developed by ISO/TC 122, Packaging, to secure cargo of containers, independent of the container. Now ISO/TC 104 has initiated a similar work item.

As with any “new” technology RFID is experiencing growing pains as it matures. However, wireless identification technology holds great promise for improved efficiencies and reduced costs. RFID and sensors are recognized as two of the most promising technologies under development within ISO.

About the author

Craig K. Harmon is President and CEO of QED Systems. He is the Convenor of the ISO working group addressing RFID applications in the supply chain (ISO/TC 122/WG 10), as well as the RFID Experts Group, and the group developing the US positions for ISO RFID standards. He is also the Chair of the ISO committee on mobile item identification and management, and the ISO committee responsible for the development of sensor specifications. Mr. Harmon is the author of four books on data collection technology, including Reading Between the Lines and Lines of Communications, and he is a content contributor to the Website: autoid.org.
Fast forward
How ISO standards bolster the promising market

by Barba Pier Hickman

What is radio frequency identification (RFID)? In 1995, when I first started evaluating RFID as a career, very few people had ever heard the phrase or the acronym. I remember one person asking me if I was going to work for a company who builds the dials and displays on radios to identify the frequency for various radio stations. I knew then that standards did not exist and were sorely needed.

Fast forward 15 years. The same day that I was asked to write this article, a contractor for our local water company in Colorado asked me if they could install a radio communication device on my water meter to more accurately and efficiently communicate water usage information associated with my identified house.

They described how the information would be automatically transmitted to city vehicles as they drove past my home. I asked if they were hearing concern from citizens about this new programme, and I was told, “No, these days most people understand the benefits of employing wireless, radio identification and communication devices – they are actually more accurate than humans.” I was so proud!

Standards drive market adoption by spreading knowledge and awareness of the technology. They encourage entrepreneurs to develop new solutions for new markets that unfold and explode to create our future. So has been the story of RFID, but the story has just begun…

Embedded in this article are predictions of the future market size of RFID based on the technology and solution providers interviewed and, therefore, only an indication of its full potential. For every new technology, people underestimate the time required for both standards to drive market acceptance, and for end-user evaluations and solution implementation. Current estimates of 15 years are finally realistic.

Dynamic evolution

One of the best recent estimates of the future market size for RFID was published by the Electronic Communications Committee (ECC), in January 2010, with the subject line: Dynamic evolution of RFID market. The result is depicted in Table 1 showing market projections in USD billions.

The ECC is the Committee for European Conference of Postal and Telecommunications Administrations (CEPT) in radio spectrum and telecommunications numbering/addressing. The intent of their research was to draw a detailed inventory of the actual RFID market and applications. Emphasis was given on the relevant part of the ultra high frequency (UHF) band and on comparing findings to the results of their planned evolution study.
RFID applied

The ECC report derived their projections by looking at a diverse range of applications, some of which are highlighted below. Although not all RFID applications use the same frequency bands, most applications use currently-popular frequencies in high frequency (HF) or ultra high frequency (UHF).

Logistics and materials handling
Mobile assets are tagged for their use along the supply chain. Typical examples are RFID-tagged cartons, containers and pallets which are used at different production stages. Other materials handling applications include libraries, book stores, waste management and many other applications in daily life.

Item level tagging
This is used for theft control when combined with electronic article surveillance (EAS).

Asset monitoring and maintenance
Fixed and high-value assets are usually tagged to store information, e.g. for maintenance purposes.

Item flow control in processes
For item flow control, RFID tags are attached to items, which move through a manufacturing process. This mainly aims to avoid costly errors during the production process.

Inventory audit
A prominent application is the use of RFID for inventory audit. Examples include retailers’ warehouses where pallets and sometimes cases are tagged to improve the speed, accuracy and efficiency of stock control.

Authentication
For authentication purposes, RFID is used to provide secure identification mechanisms for persons and objects. Prominent examples of personal authentication are company entry badges, transportation system cards, electronic passports and identity cards. Current fields of application for object authentication include the tagging of drugs in the pharmaceutical sector and high-value goods in the luxury sector to prevent counterfeiting.

Payment systems
RFID technology is used for payment systems to secure transactions. Security requirements for tags are very high. Public transportation system is a major application, from car parks, to toll booths to public transport cards.

Automatic display of information
In the emerging field of automatic display of information, items are tagged to provide additional information on products and services when read.

Medical applications
RFID has some very specific uses in healthcare. Most common uses of RFID in healthcare are medication administration, authentication and restocking, hospital equipment tracking, medical supplies tracking, asset and substance tracking, medical waste tracking, patient tracking, blood banking, lab and pathology sample tracking, medical alert implants, self-medication for seniors.

Table 1 – ECC RFID market projections in USD billions (2009-2019).

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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tags – passive</td>
<td>2.18</td>
<td>2.49</td>
<td>2.88</td>
<td>3.31</td>
<td>3.90</td>
<td>4.61</td>
<td>5.98</td>
<td>6.72</td>
<td>7.83</td>
<td>9.27</td>
<td>10.81</td>
</tr>
<tr>
<td>Tags – active/battery assisted passive (BAP)</td>
<td>0.21</td>
<td>0.22</td>
<td>0.28</td>
<td>0.37</td>
<td>0.57</td>
<td>0.75</td>
<td>0.99</td>
<td>1.16</td>
<td>1.26</td>
<td>1.43</td>
<td>1.57</td>
</tr>
<tr>
<td>Interrogators (incl. mobile phones)</td>
<td>1.20</td>
<td>1.22</td>
<td>1.69</td>
<td>2.25</td>
<td>3.20</td>
<td>4.08</td>
<td>5.09</td>
<td>5.12</td>
<td>5.35</td>
<td>5.47</td>
<td>5.71</td>
</tr>
<tr>
<td>Networking, software, services</td>
<td>1.97</td>
<td>2.28</td>
<td>2.68</td>
<td>3.38</td>
<td>5.17</td>
<td>6.85</td>
<td>8.38</td>
<td>8.97</td>
<td>9.03</td>
<td>9.33</td>
<td>9.50</td>
</tr>
<tr>
<td>Total value USD billion</td>
<td>5.56</td>
<td>6.21</td>
<td>7.53</td>
<td>9.32</td>
<td>12.84</td>
<td>16.49</td>
<td>20.44</td>
<td>21.97</td>
<td>23.47</td>
<td>25.49</td>
<td>27.59</td>
</tr>
</tbody>
</table>

Table 2 – Common frequency ranges for RFID applications driven by ISO standards.

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Commonly associate applications</th>
<th>ISO (and ISO/IEC) standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>LF &lt;135 kHz</td>
<td>Animal identification, access control, car ignition keys</td>
<td>ISO/IEC 18000-2</td>
</tr>
<tr>
<td>UHF 433 MHz</td>
<td>Active RFID for cargo handling and military logistics in the USA &amp; NATO countries</td>
<td>ISO/IEC 18000-7</td>
</tr>
<tr>
<td>UHF 840 – 960 MHz</td>
<td>Materials handling, asset tracking, logistics supply chain, item-level tracking, RFID/electronic article surveillance (EAS) tags, cargo handling, airline baggage, transportation</td>
<td>ISO/IEC 18000-6, ISO/IEC 29143</td>
</tr>
<tr>
<td>UHF 2.45 GHz</td>
<td>Item management</td>
<td>ISO 18000-4</td>
</tr>
</tbody>
</table>
### Table 3 – VDC Research Group: Total global RFID shipments segmented by application.

<table>
<thead>
<tr>
<th>Application</th>
<th>Historical 2007</th>
<th>Base Year 2008</th>
<th>2009</th>
<th>2013</th>
<th>CAGR* 2008-2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply chain management</td>
<td>883.6</td>
<td>1060.5</td>
<td>1135.4</td>
<td>1995.7</td>
<td>13.5%</td>
</tr>
<tr>
<td>Asset tracking &amp; Real-time locating system</td>
<td>363.0</td>
<td>450.8</td>
<td>514.5</td>
<td>1241.5</td>
<td>22.5%</td>
</tr>
<tr>
<td>Security/Access control</td>
<td>556.2</td>
<td>687.2</td>
<td>748.1</td>
<td>1212.3</td>
<td>12.0%</td>
</tr>
<tr>
<td>Sensing/Monitoring</td>
<td>25.7</td>
<td>33.8</td>
<td>40.2</td>
<td>243.9</td>
<td>48.5%</td>
</tr>
<tr>
<td>Rental item tracking</td>
<td>29.5</td>
<td>38.8</td>
<td>45.6</td>
<td>142.9</td>
<td>29.8%</td>
</tr>
<tr>
<td>Shop-floor automation</td>
<td>99.2</td>
<td>133.9</td>
<td>156.8</td>
<td>369.8</td>
<td>22.5%</td>
</tr>
<tr>
<td>Point of sale</td>
<td>122.2</td>
<td>158.3</td>
<td>178.9</td>
<td>355.9</td>
<td>17.6%</td>
</tr>
<tr>
<td>Animal tracking/ID</td>
<td>119.6</td>
<td>173.6</td>
<td>198.0</td>
<td>561.0</td>
<td>26.4%</td>
</tr>
<tr>
<td>Baggage handling</td>
<td>25.9</td>
<td>36.7</td>
<td>47.5</td>
<td>197.0</td>
<td>40.0%</td>
</tr>
<tr>
<td>Ticketing</td>
<td>148.8</td>
<td>204.2</td>
<td>232.4</td>
<td>692.8</td>
<td>27.7%</td>
</tr>
<tr>
<td>Toll collection</td>
<td>180.1</td>
<td>184.8</td>
<td>193.8</td>
<td>271.7</td>
<td>8.0%</td>
</tr>
<tr>
<td>Other</td>
<td>398.6</td>
<td>635.0</td>
<td>716.6</td>
<td>1583.0</td>
<td>20.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2952.4</strong></td>
<td><strong>3797.6</strong></td>
<td><strong>4207.8</strong></td>
<td><strong>8867.4</strong></td>
<td><strong>18.5%</strong></td>
</tr>
</tbody>
</table>

* Compound annual growth rate.

**Animal identification**

The control of pets, livestock, the food chain, farming, diseases, protection of endangered species using either implanted or external tags (e.g. ear tags).

The diversity of technically rigorous ISO standards has bolstered this promising market. Table 2 outlines the most common frequency ranges for RFID along with a few of the applications and standards commonly associated with each frequency.

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### Market growth projections

High frequency (HF) is a globally harmonized range which operates between 13.553-13.567 MHz. The ECC believes that the global market for HF RFID will triple from USD 2.9 billion in 2008 to USD 8.6 billion in 2018.

UHF is not harmonized, but thanks to the great work of regulatory agencies around the world over the last decade, UHF RFID systems operate in a range between 865-915 MHz (but must meet the exact bandwidth and power levels approved in the different regulatory regions).

The ECC report states: “It is predicted that, in five years, more than 170 000 RFID readers will be deployed in Europe at 30 000 locations. During this period these readers will process a total of about 3 billion tags. These numbers will grow significantly, and by 2022, it is expected that more than 6 billion readers will be operating at 450 000 locations, with about 86 billion tags purchased annually.”

“...It is believed that these numbers are conservative, as they only represent a small percentage of the total potential number of objects that can be tagged. For example, the forecast is based on the estimate that in 2012 approximately 2% of all items in retail will be tagged.

“In 2022 the forecast is that roughly 25% of all non-food items and 5% of all food items in retail will be tagged. If we experience a technology breakthrough in the next fifteen years that reduces the cost of an RFID tag to less than one cent, these numbers could increase dramatically. In particular the number of tags on food items could grow to hundreds of billions.”

---

**The way forward**

In today’s world, the vast majority of people understand the acronym “RFID.” Those who cannot instantly recall the phrase associated with the acronym absolutely recognize it when prompted. They can even explain how they use radio frequency products to make their lives easier.

Naturally, there are certain hurdles to overcome. As with cell phones, we have to first show consumers the benefits of using a new technology before asking them to put up with the potential drawbacks or inevitable privacy issues. We have come a long way, but it is only the beginning of what promises to make a huge impact in the coming years.

In another 15 years, and probably well before 2025, RFID will be ubiquitous. Thanks to ISO.

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**About the author**

**Barba Pier Hickman** is founder of Applied Clarity, Inc., a consulting firm that leads companies to identify and overcome barriers to technology adoption and market acceptance. She has served as Chair and Secretary of a number of ISO, the American National Standards Institute (ANSI) and EPC Global standards committees, including serving as the founding Chair for ISO/IEC JTC 1/SC 31/WG 4/SG 3. Ms. Hickman has received an award from the InterNational Committee for Information Technology Standards (INCITS) “for her contributions to the worldwide advancement of automatic identification and data capture through the use of radio frequency identification.” She is currently an RFID standards and strategy consultant for Intermec Technologies, Inc.
Beyond the barcode
Next generation libraries

by Leif Andresen

A smooth and straightforward check-in/check-out process for books is key to the library business, and RFID can make a significant contribution. The technology is revolutionizing data management in libraries by optimizing the communication and retrieval of item-specific information. The first experiments with RFID in libraries took place in the 1990s. Since then, the use of RFID has expanded rapidly. ISO is working on a standard harmonizing international guidance to help libraries graduate from the old barcode to RFID tags, ISO 28560, Information and documentation – RFID in libraries.

How it works

Passive RFID tags with antennas are attached to books, CDs and other library materials. When these assets are checked into, or out of the library, an RFID reader sends a radio signal to retrieve the information on the RFID tag.

The first step is to validate the application family identifier (AFI) value to ensure it is a library item (see Box on page 17). Two values are dedicated for library use, distinguishing between items “in-library” from those “on loan”. This information may also be used by security gates.

Service improvements

A particular benefit of using RFID for library circulation is the ability to handle composite materials. Examples might be a multivolume book, a box set with three CDs, or an audio book with 15 tapes. A data element records the number of items in the entire set and their identity. The check-out function warns when items are missing. This function solves a major problem of barcode-based self-service.

RFID in libraries can provide functionality beyond circulation. Some libraries use RFID for stock control by scanning shelves and comparing the results with the library’s database to find “lost” or miss shelved items, as well as to take inventory.

RFID may also support the acquisition process. An ISBN or equivalent number on the incoming book tag might identify itself to the library acquisition module, and provide a link to the supplier and order number. The future ISO 28560 will...
include data elements for this information. Privacy concerns require that this data be erased before library circulation.

Another potential use for RFID enables users to "show" a book to a screen in the library to retrieve reviews and user comments.

Global solution

Why the need for an International Standard? Books and other assets are not only used by the library that owns them. For example, interlibrary loans are a common way for national and regional library systems to meet user needs while minimizing duplication of relatively low-demand materials.

At the international level, it is also important to ensure that software and hardware vendors of library RFID systems can deliver standardized products. A variety of incompatible national specifications would drive up the cost of these products.

A common solution is also important to avoid libraries becoming dependent upon specific vendors. RFID tags must be available from a variety of sources. Books and CDs from different library vendors should be supplied with RFID tags already inserted.

Attractive benefits

The growth of RFID use has resulted in several countries adopting national processes that specify data models and encoding. But at the same time there is widespread recognition of the need for international consensus. ISO working group WG 11, RFID in libraries, was created for this purpose within technical committee ISO/TC 46, Information and documentation, subcommittee SC 4, Technical interoperability.

The result of their efforts is the three-part standard ISO 28560, RFID in libraries, which has now entered the final stages of development.

Part 1: General requirements and data elements, describes the overall data model. Encoding options are described in Part 2: Encoding based on ISO/IEC 15962, and Part 3: Fixed length encoding.

Another potential use for RFID is as an information tool.

The data model specified in Part 1 comprises 25 data elements. The only obligatory element is the primary item identifier, mandatory for items on the shelf. Experience shows that data and description of data elements are more durable than hardware, software and encoding.


According to these rules different optional data elements may be selected, including for RFID tags of items in the same library. The encoding rules also enable optional data to be organized on the RFID tag in any sequence. And they provide for flexible encoding of variable length and variable format data.

Part 3 defines a basic subset of data elements, specifying how to encode these in a basic block on the RFID tag. Precise specifications are given for encoding other data elements in additional blocks of variable length.

Both Part 2 and Part 3 use the 13.56 MHz (Megahertz) frequency, which to date has been most common for RFID applications in libraries. However, the division of ISO 28560 into multiple parts opens the possibility for the addition of new parts defining tag encoding using other frequencies.

Note: TAGSYS provides reliable RFID infrastructure to ease the identification and management of all types of library media.
Leif Andresen is Chief Adviser at the Danish Agency for Libraries and Media and Chairman of Danish Standards S24, Information and Documentation. He is the Convener of ISO/TC 46/SC 4/WG 11, RFID in Libraries. Mr. Andresen has worked on library standardization since the 1990s, focusing in particular on technical interoperability.

Application family identifier

The application family identifier (AFI) is used as a mechanism to select tags across the air interface, minimizing the extent of communication transaction time with tags that do not carry the relevant AFI code.

AFI value C2\textsubscript{HEX} has been assigned explicitly for library use under the soon-to-be finalized ISO/IEC 15961-2, Information technology – Radio frequency identification (RFID) for item management: Data protocol – Part 2: Registration of RFID data constructs.

A library may use the AFI in one of two ways.

A single AFI with the value C2\textsubscript{HEX} distinguishes library items from others products, and avoids the risk of an RFID reader for a different domain, reading the RFID tag on a loan item. It also enables a library system to reject items that carry a different AFI code.

The AFI may additionally be used as part of an “item security system”, where the value C2\textsubscript{HEX} is written to tags of items on loan to a client. When the books are returned, an in-stock AFI is written to the tag (07\textsubscript{HEX} according to the soon-to-be finalized ISO 15961-3, Information technology – Radio frequency identification (RFID) for item management: Data protocol – Part 3: RFID data constructs).

The ISO 15961 series is being developed within ISO/IEC JTC 1, Information technology, subcommittee SC 31, Automatic identification and data capture techniques, working group WG 4, Radio frequency identification for item management.

Growing influence

Tags encoded according to ISO 28560-3 are used by national systems, such as DS/INF 163 (known as the Danish Data Model, or DDM). RFID interrogators capable of reading tags according to DS/INF 163 can also read tags according to ISO 28560-3. This means that the installed base of DDM, implemented in several countries, can easily be moved to the future ISO 28560.

Most RFID vendors are aware of the upcoming ISO 28560. Committees in several countries are preparing to implement the new standard.

Denmark has decided to publish ISO 28560 as a Danish standard DS/INF 28560. By the end of 2010, more than half of Denmark’s public libraries are expected to have RFID systems in place. In the United Kingdom, a technical committee from the ISO member body (BIS), has prepared a national profile based on ISO 28560-2.

It is expected that many more countries will soon follow.

About the author

Leif Andresen is Chief Adviser at the Danish Agency for Libraries and Media and Chairman of Danish Standards S24, Information and Documentation.

He is the Convener of ISO/TC 46/SC 4/WG 11, RFID in Libraries. Mr. Andresen has worked on library standardization since the 1990s, focusing in particular on technical interoperability.

* Hex (hexadecimal) is a positional numeral system with a base of 16. Each hexadecimal digit represents four binary digits.
A new challenge
Plugging security gaps

by Matthew J. Harmon and Natascha E. Shawver

The number of RFID applications in everyday use has exploded over the last decade, with tiny radio frequency (RF) tags now tracking products, animals and assets all over the world. The benefits of the technology range from improved supply chain management to efficient inventory tracking.

Some of the largest organizations in the world, such as the US Department of Defense and the retail giant Wal-Mart, use RFID to track shipments. Cattle ranchers tag livestock. Hospitals maintain chains-of-custody for drugs and supplies. RF tags are found in passports, credit cards and library books – and they’re even used to track endangered species.

No single countermeasure is 100% effective.

While RFID has proven its usefulness in many areas of modern life, significant challenges must be resolved before the technology’s full potential can be realized. With falling prices and enhanced capabilities eliminating many obstacles, attention has shifted to the security component of RFID deployments.

Hacking evolves

Breaches in RFID security – both real and potential – have been well publicized in the media, creating unease among consumers, companies, policy makers and other RFID security stakeholders. Most RF tags do not encode personally identifiable information (PII).

So far, there have been only a few instances of RFID applications being compromised, but a successful “drive-by cloning” of RFID tags in passports by a British hacker (in which data was copied from documents carried in the owners’ pockets and purses) showed that the potential for damage is real. The past history of computer hacking makes it clear that new attack methods will evolve over time.

Hacking poses a threat to the confidentiality, integrity and availability of RFID systems. It can disrupt business, cause serious privacy breaches, and undermine trust in the technology itself.

The RFID industry has recognized these challenges by actively working to add security measures such as encryption and authentication to the tags. Because encryption reduces the available storage space on a tag and authentication slows reading response times, the challenge is to strike a balance among the requirements for efficiency, the demand for low-cost RFID solutions, and the privacy requirements of a concerned public. International Standards are the solution.

Data protection at every step

A security breach can happen at the tag, at the reader (also referred to as an interrogator) or, less often, at the network level. ISO/IEC TR 24729-4:2009, Information technology – Radio frequency identification for item management – Implementation guidelines – Part 4: Tag data security, defines RFID security as the prevention of unauthorized reading or changing of RFID data. This means protecting the data on the tag, and the data transmitted between the tag and reader to ensure it is accurate and safe from unauthorized access.

In broad terms, RF tags are small wireless devices, consisting of a microchip and an antenna, which emit information when interrogated by RFID readers. Hundreds of models of commercially available tags fall into two basic categories: active and passive tags.

Passive tags, currently the most commonly used devices, require higher power interrogators that create a continuous radio wave. The passive RF tag receives the radio wave and reflects (or modulates) a return signal to the interrogator consistent
with the data programmed into the passive tag.

Active tags have an embedded transmitter and generally transmit at far less power than passive tags. Most active tags currently in use incorporate batteries, though future energy-harvesting techniques may change that.

The basic difference between active and passive tags is that the active tags transmit and passive tags reflect a received signal.

Vulnerabilities

Tags, readers and the air interface between them are susceptible to a number of possible attacks that fall into three main categories: mimicking, gathering and denial of service.

Mimicking encompasses spoofing, cloning and applying malicious code. To spoof tag data, the data is duplicated and transmitted to a reader. Cloning involves duplicating the data from one tag onto another tag. An example would be exchanging a container seal with a cloned tag after a thief breaks into the container to steal or tamper with its contents.

Malicious code put on the tag could hypothetically compromise an entire enterprise system and disrupt a business, although the risk of such damage is currently limited due to the memory and range restrictions of most tags.

Gathering information from the tag takes place through skimming (unauthorized reading of data on a tag); eavesdropping (unauthorized listening/intercepting through the use of radio receiving equipment of an authorized transmission); data tampering (unauthorized erasing of data to render the tag useless or altering of the data, for instance to change the price of a tagged item in a store).

Denial of service attacks occur when multiple tags or specially designed tags are used to overwhelm a reader’s capacity to differentiate tags, rendering the system inoperative. Readers can also be jammed and tags can be physically blocked to disrupt reading. The tag can be mechanically or electronically “killed” to prevent it from being read.

Standards for application security

As RFID technology and security threats evolve, so does the need for standards. In 2009, the technical report ISO/IEC TR 24729-4 giving guidelines on RFID tag data security was published. The report was based on the work developed by the RFID Experts Group (REG) set up by the Association for Automatic Identification and Mobility (AIM) – the global trade association for the automatic identification and data capture (AIDC) industry.

The challenge is to strike a balance.

The ISO/IEC report assesses risks according to the Open Web Application Security Project’s (OWASP) “DREAD” model by looking at:

• The potential damage a threat represents
• The chance of reproducibility
• What is needed to exploit a threat
• How many users would be affected
• How easy it is to discover a threat.

The group analyzed the probability of a threat and its potential impact in various scenarios by looking at supply chain tags, smart cards, customer loyalty cards, contactless payment cards and other RFID applications to discern the security implications for each scenario.

The guidelines recommend a number of countermeasures to safeguard security, such as the use of a unique tag identification as defined in ISO/IEC 15963:2009, Information technology – Radio frequency identification for item management – Unique identification for RF tags.
This may include password protection, encryption, and various authentication measures. No single countermeasure is 100% effective in all situations. Combinations of countermeasures can be used to increase RFID data access security.

Existing RFID standards that already have specific security components built into them include the following:
- ISO/IEC 7501 series for machine readable travel documents
- ISO 13181 series on Communications Access for Land Mobiles (CALM)
- ISO/IEC 15693 series for vicinity cards (i.e., cards which can be read from a greater distance as compared to proximity cards)
- ISO/IEC 15963:2009 for RF tags
- ISO/IEC 18000 series for item management
- ISO/IEC 21451-7 for transducers to RFID systems communication protocols and transducer electronic data sheet formats.

Basic framework standards for security are being or have been developed by ISO/IEC JTC 1, Information technology, subcommittee SC 27, IT Security techniques, and ISO/TC 8, Ships and marine technology.

In the pipeline

The recently created working group WG 7, Security for item management, of ISO/IEC JTC 1/SC 31, Automatic identification and data capture techniques, will “provide standards and a framework for security of automatic identification and data capture systems, particularly the air interface and other SC 31 wireless communications components.”

It has also set goals to define appropriate secure file management techniques for various memory sizes and configurations, to identify risks and potential controls and to deliver a suite of solutions that enable the implementation of various tiers of security for item management.

ISO/IEC JTC 1/SC 31/WG 7 will have to deal with some important requirements. One is the demand for low prices—security features add to the cost of the tag. Another is efficiency, since reading tags becomes slower when security features are added. And there is also the need for interoperability, which is already an issue due to the conflicting needs of proprietary solutions and supply chains.

Building on existing standards

Challenges arise from RFID’s pervasive use in highly disparate areas, including ports, health care, financial services, networks, audio-visual, biometrics, personal identification, databases, home electronics, printing, intelligent transportation systems, industrial automation, anti-counterfeiting and what is commonly referred to as “the” supply chain (where, in truth, there are many).

A search of the ISO database reveals some 240 standards that include “security” in their title. We clearly need to build on existing security standards to provide:
- A common, harmonized framework for a more secure supply chain, for example in health care and port security where the risks are too high to ignore
- A base of transparency and privacy for consumers
- Technical guidance for policy makers addressing these issues.

If the technology is to become as ubiquitous as the promise suggests, it is imperative for the RFID community to develop comprehensive solutions for both security and privacy. SC 27 and SC 31 are working hard to provide those solutions.

About the authors

Matthew J. Harmon is the Vice President of Security and Risk Management at QED Systems, and he serves as the US Technical Advisory Group Chair for ISO/IEC JTC 1, Information technology, subcommittee SC 31, Automatic identification and data capture techniques, working group WG 7, Security for item management. He is also the SC 31 liaison to ISO/IEC JTC 1/SC 27, IT Security techniques, and a member of the ISO Technical Management Board Privacy Steering Committee.

Natascha E. Shawver is a freelance journalist with a focus on the societal effects of information technology. She holds a Masters Degree in political science from the University of Heidelberg, Germany and a journalism diploma from the Free Journalism School in Berlin, Germany.

1) Currently under development.
Advanced transponders
Animal identification to the next level

by Pieter Hogewerf and Kees van’t Klooster

Tracing livestock throughout their lifetime is key to controlling diseases and ensuring product quality. For this purpose, animals are connected to a permanent identification device and their details kept in databases (e.g. at farm, breeding association or national levels). Although traditionally the devices consisted of visual ear tags, the use of radiofrequency identification (RFID) is nowadays more common. In response to the latest market trends, ISO is currently working on a standard that will take RFID identification of animals to the next level.

RFID tags for animals come as ear tag transponders, bolus transponders (for livestock) or injectable transponders (for pets).

In farms, RFID tags can be used for individualized treatment of animals in computerized milking routines, feeding equipment and sensor systems for measuring health.

RFID tags are also widely used for identifying companion animals. This allows veterinarians to give adequate treatments, facilitates customs clearing and helps animal protection societies looking for owners of lost pets.

RFID can also be used to track animals in the wild.

14 years ago

It is now 14 years since the first ISO standards for RFID identification of animals were published. These include:
• ISO 11784:1996, Radiofrequency identification of animals – Code structure

These standards are based on low-frequency communication in the 134.2 kHz (kilohertz) band. This communication path works very well for boluses and injectable transponder applications where the signal passes through aqueous tissue.

Transponders (tags) conforming to ISO 11784 and ISO 11785 carry identification information as a 15-digit worldwide unique identification code. The first three digits refer to the country of origin of the animal (conforming to ISO 3166-1:2006, Codes for the representation of names of countries and their subdivisions – Part 1: Country codes). The remaining 12 digits comprise the actual ID code.

ISO 11785 allows both the use of full duplex transponder communication (FDX-B) as well as half duplex transponder communication (HDX). In the FDX-B system, data is transmitted when the reader’s magnetic field is activated. In the HDX system, data is transmitted after the magnetic reader field has been deactivated.

ISO 11785 is based on a sequential reading of transponders. Although it is feasible to read an FDX-B and an HDX transponder within one reader activation cycle, it is impossible to read more than...
Today’s radio-frequency identification (RFID) systems identify and track products, animals or people using radio waves – regardless of their location or distance – for uses as diverse as paying for public transport to tracking freight containers.

This technology is made possible by ISO standards which enable interoperability for tracking items throughout the supply chain, from creation to consumption, as well as recyclability and re-use.
Helping the blind identify buses, clothing, etc.

Pallets traceability

Product inventory and monitoring

Luggage identification

Passport authentication

Item flow control

Item security

Payment

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Shoppers would enter their preferences, the amount of time they had, and their allocated budget, and the device would use RFID to identify where they are and send information about stores, their location and special offers. And for users that were just looking to hang out, the device would suggest coffee shops, restaurants or even films currently playing, based on the individual’s interests.

Sales managers involved in the pilot believed the device helped their business attract more customers and increase sales.

one transponder of the same technology at the same time (i.e. two FDX-B transponders), since the signal would be scrambled.

**Market needs**

Today’s RFID animal market is calling for transponders capable of carrying (and writing) additional information about the animal (e.g. the possibility to add data collected by sensors into the advanced transponder memory and/or insert details of the animal’s owner). The market is also requesting the capability to read data despite the presence of more than one transponder of the same technology.

Because of this market development, ISO technical committee ISO/TC 23, Tractors and machinery for agriculture and forestry, subcommittee SC 19, Agricultural electronics, working group WG 3, Identification, started working on a standard for advanced 134.2 kHz animal radiofrequency identification technology.

The result is ISO 14223 for advanced transponders (see Box), which enables both adding information into a transponder’s memory during the life of the animal, as well as the ability to simultaneously read more than one transponder of the same type (via an anti-collision protocol).

The base for ISO 14223 transponders uses the ISO 11784 code structure. These transponders are thus fully compatible with readers complying to ISO 14223 as well as ISO 11784 and ISO 11785.

**Tricky collisions and how to avoid them**

As previously mentioned, under the ISO 11785 protocol, communication is not possible when multiple transponders using the same technology are in the field of the reader. The explanation is simple. ISO 11785 FDX-B transponders transmit data (ISO 11784 code) when they come in contact with the magnetic field of a reader. If two (or more) FDX-B transponders enter the magnetic field at the same time, both transponders will be activated, resulting in mixed signals (collisions) that make demodulation impossible.

Similarly, ISO 11785 HDX transponders transmit ISO 11784 code after the magnetic field of a reader is switched off (the transponder is charged when the magnetic field is present). If two (or more) HDX transponders are charged and the field switches off, both will be activated, thereby resulting in collisions.

In comes ISO 14223. Its anti-collision protocol specifies a mechanism to be activated by the reader when collisions are detected. Transponders in anti-collision mode must then randomly select a time frame (among 16 available) for sending data.

**Remember this**

The memory of the ISO 14223 transponder is split into three different sections. The first section is for the ISO 11784 code. The second section has a fixed allocation for predefined information, and the third section is used in combination with object identifiers for maximum flexibility (e.g. for future requirements).

Consequently, there are three different levels of communication with advanced transponders (described below).

**ID reading access**

This method is ideal for ID readings that have to be performed in the shortest possible time when the animals are moving. This is the case, for example, when animals are passing an antenna in a raceway, or when the animals’ identity has to be checked. In either situation, the ISO 11784 code – packed in an ISO 11785 data telegramme – will be “read only”.

In a raceway, no guarantees can be given that anti-collision mechanisms will lead to high identification percentages, especially if the animals are passing the
Dr. Kees van’t Klooster is Director of Innovative Modern Agriculture at Wageningen b.v. (a company active in the field of animal identification). His research covers international agricultural, land and water engineering in a broad sense including animal identification. Dr. van’t Klooster is Convenor of ISO/TC 23/SC 19/WG 3 on animal identification.

Pieter Hogewerf is Director of Innovative Modern Agriculture – Wageningen b.v. (IMA –Wageningen). He is responsible for the ICAR-approved animal identification test laboratory and is Project Leader of several ISO animal identification standardization projects within ISO/TC 23/SC 19/WG 3. He is involved as Project Leader in several international and national animal identification projects.

All encompassing and compatible

ISO 14223 is divided into three parts.

Air interface

Part 1: Air interface originally published in 2003 is currently being revised. It specifies the air interface between the transceiver and the advanced transponder. It is fully compatible with ISO 11784 and ISO 11785.

Code and command structure

Part 2: Code and command structure (currently under development) specifies the code and command structure. It ensures full compatibility with ISO 11784 and ISO 11785.

Part 2 can be considered an extension of, and should be used in conjunction with, ISO 11785. It enables application of advanced technologies, and facilitates storage and retrieval of additional information (integrated database), reading of integrated sensors, and much more.

Applications

Part 3, Applications (currently under development) describes the memory use, its format and how to access information.

Fast data access

This procedure requires that an animal be in a more or less fixed position. It is ideal when limited time (approximately one second) is available for communication, and it allows for both reading and writing information.

The reader commands that the content of a specific memory block be retransmitted. The contents of memory blocks are defined in ISO 14223-3. Data may include: date of birth, sex, registration database and/or telephone number of owner or contact.

SAM is limited to 16 memory blocks, with 32 bits of data each. The reader can access the blocks individually and either:

- Read the 32 bits data
- Write 32 bits into that block
- Lock the block, which means its content cannot be altered anymore.

These functions can be protected by a password.

Data directory driven memory access

This procedure allows for both reading and writing information. It requires the animal to be in a fixed position, and sufficient time for communication. Any type of information may be stored as long as the community of users defines a key (known as an object identifier), which specifies the kind and format of data to be included (e.g. vaccinations, animal movement between different properties, etc.).

Almost here

ISO 14223-1 (latest revision) and ISO 14223-2 are expected to be published end of 2010. ISO 14223-3 should become available early 2012.

ISO 14223 responds to a market need for additional information.

The procedure is known as single block access (SAM). Fast access to the desired data is necessary. This is realized by having specific data at a fixed location in the transponder memory.

Almost here

ISO 14223-1 (latest revision) and ISO 14223-2 are expected to be published end of 2010. ISO 14223-3 should become available early 2012.
Supply chain applications

A systematic approach to seamless and secure tracking

by Craig K. Harmon

There are significant benefits in being able to track products as goods move through the supply chain, including loss prevention, inventory control, and in-transit visibility.

“Supply chain” designates an overall process that results in goods being transported from the point of origin to a final destination. It includes the movement of the goods, the shipping data and the associated processes, including the dynamic links between the different participants.

These include many entities, such as producers of the goods, logistics management firms, consolidators, truckers, railroads, air carriers, marine terminal operators, ocean carriers, cargo/mode/customs agents, financial and information services, and buyers.

Technology only getting better

Twenty years ago, tracking products in their movement was difficult, at best, and largely impractical due to the requirements for data entry: completion of forms, key-entry of source documents, and subsequent communications to trading partners. These manual processes were slow and error-prone; so much so that the value of the results often did not equal the cost of the effort.

In the early 1990s, we were able to augment the manual processes with the application of the quick and accurate bar code technology. Today, we are taking the next step.

Whereas bar codes require line of sight and can only be scanned one at a time, radio frequency identification (RFID) enables potentially hundreds of tagged items to be read within seconds. Further – depending upon the materials – tags can be embedded within the product packaging and read without ever having to open the transport unit. This “transparency” of identification provides both an opportunity and a challenge.

Since multiple items can be read – both within the package and the package itself – it becomes necessary to distinguish which of the two levels of packaging are being read. Today’s RFID systems enable reading of all tags: product tags, transport unit tags or any combination of packaging levels, between or above.

Standards at work

ISO technical committee ISO/TC 122, Packaging, has taken the lead in defining the use of RFID throughout the sup-
Supply chain. Within ISO/TC 122, working group WG 10 has developed a suite of standards to ensure compatibility at the physical, command and data level, with five International Standards under the general title: Supply chain applications of RFID (see Figure 1).

Where possible, this compatibility takes the form of interchangeability. Where interchangeability is not feasible, the International Standards within this suite are interoperable and non-interfering. The International Standards within the complete series of supply chain applications of RFID include:

- ISO 17363:2007, Supply chain applications of RFID – Freight containers
- ISO 17364:2009, Supply chain applications of RFID – Returnable transport items
- ISO 17365:2009, Supply chain applications of RFID – Transport units

![Diagram of supply chain applications of RFID](image)

**Figure 1** – Supply chain applications of RFID.

*TPA*: Trading Partner Agreement
Craig K. Harmon is President and CEO of QED Systems. He is the Convenor of the ISO working group addressing RFID applications in the supply chain (ISO/TC 122/WG 10), as well as the RFID Experts Group, and the group developing the US positions for ISO RFID standards. He is also the Chair of the ISO committee on mobile item identification and management, and the ISO committee responsible for the development of sensor specifications. Mr. Harmon is the author of four books on data collection technology, including Reading Between The Lines and Lines of Communications, and he is a content contributor to the Website: autoid.org.

Figure 2 – Pallet (RTI) and returnable packaging items (RPI).

- ISO 17366:2009, Supply chain applications of RFID – Product packaging

These International Standards define the technical aspects and data hierarchy of information required in each layer of the supply chain. The air-interface and communications protocol standards (supported within the supply chain applications of RFID International Standards) are ISO/IEC 18000, ISO/IEC 24730 and ISO/IEC/IEEE 8802-15-4. Commands and messages utilize ISO/IEC 15961 and ISO/IEC 15962, semantics are defined in ISO/IEC 15418, and syntax is defined in ISO/IEC 15434.

Overcoming issues

ISO periodically reviews its standards to ensure that they retain their usefulness as state-of-the-art tools for business, government and society. With a similar intention, ISO/TC 122 will be reviewing the 2007 and 2009 standards with special attention given to three issues.

The first deals with assets that might be associated with a pallet or packaging (returnable packaging items), such as in Figure 2, specifically the posts and packaging materials.

These assets are sent to the customer with the full expectation that they will be returned in the same quantity as was sent. This then leads to a need for a technique to associate the returnable packaging items (RPI) with the base returnable transport item (RTI) pallet.

The second issue requiring additional clarity was the interface among sensors, the RF tag and the infrastructure. There has been substantial advancement in the standardization of sensor interfaces between the publication of the ISO 1736x series and today.

Two important standards from the IEEE under the ISO/IEEE the Partnership Standards Development Organization (PSDO) have been submitted for publication as ISO International Standards: the IEEE 1451 series and the wireless sensor interface of IEEE 802.15.4. Rather than reinventing the wheel by developing new (and overlapping standards), these IEEE standards will serve as the basis for sensors communicating to RF tags, sensors communicating to infrastructure, and sensors communicating to networks (e.g. the new work of the ISO/IEC JTC 1, Information technology, working group WG 7 on sensor networks).

The third issue is the data format of the RF tags. It has become increasingly important that all automatic identification and data capture (AIDC) media share a common data structure. The bar code and two-dimensional (2D) symbol standards needed to be brought over to RFID and other AIDC media. This permits the bar code and 2D standards of ISO/TC 122 – ISO 28219 for products, ISO 22742 for product packaging, and ISO 15394 for transport units and pallets (returnable transport items) – to share the data structures of ISO 17367, ISO 17366, ISO 17365, and ISO 17364, respectively.

This data format issue requires coordination with other coding schemes to ensure no ambiguity over how RF tags are read, as well as the format of their contents. This technique further needs to enable compressed encoding so that only the required number of bits is encoded. For supply chain applications of RFID, only uppercase alphabetic characters, numerals, and a handful of special characters are needed. This is easily limited to 64 possible characters to be encoded in six binary digits.

The revisions of ISO 17367, ISO 17366, ISO 17365, ISO 17364, and ISO 17363 currently underway address all these issues. They will provide considerable added functionality, enhanced tracking of associated items (RPIs), security through sensor technology, and data structures compatible with the bar codes and two-dimensional symbols that came before.
Cargo shipment tags

Making transport more transparent, efficient and safe

by Qifan Bao

Growing in international freight volumes directly reflects the emergence of a truly global economy, and it’s safe to say that containerized shipping has become the most important element in the modernization of the transport sector. At any given time, there are some 40,000 large cargo ships plying the world’s waterways, not to mention countless smaller merchant craft, all pulling in and out of ports, loading, unloading, changing out crews and cargos, and travelling from one location to the next.

Keeping track of the location of these containers is a never-ending concern for senders and receivers alike. But in the absence of containers that automatically announce their position, the shipping industry still relies on conventional artificial or semi-artificial tracking methods. This makes it difficult to control cargo status during physical distribution, and shippers often have to extend promised delivery times to avoid violating agreements. All this adds to logistics costs.

Unified International Standards are essential.

The solution is increased transparency in container logistics, meaning that information is available for transmission to a network platform automatically when containers arrive at a key node in the conveying chain, such as a warehouse, port or deconsolidation point. Shippers and other personnel can then receive clear, reliable information on the location of containers using an Internet application.

Location reporting

Modern information technology provides an effective way to achieve this transparency. An Internet-based network is created to cover containers, with the help of RFID (radio frequency identification), wireless data communication and other technologies. Containers are able to actively “inform” the network of their location, while shippers take the initiative to “perceive” containers.

Maritime transport is an important commercial activity across any number of countries. This global nature of the industry makes unified International Standards for RFID applications in container transport absolutely essential.

A new standard is being developed to improve transparency and efficiency in the freight container transportation process. The future International Standard (ISO 18186, Freight containers – RFID – Cargo shipment tag) will ultimately benefit many stakeholders, including forwarders, insurance companies and carriers, but shippers will likely see the greatest advantages. Access to real-time information on the precise location of shipments will enable shippers to adjust production schedules and maximize return on capital employed.
Transparency and efficiency

ISO technical committee ISO/TC 104, Freight containers, subcommittee SC 4, Identification and communication, is devoted to developing standards for automatic identification, interconnection and information sharing, as well as intelligent management of freight containers. The scope of the subcommittee includes:

- Visual marks (location, encoding, design and size)
- Identification of freight containers (identity codes and marks)
- Automatic container identification systems (identification messages and related communication)
- Other container communications (definitions, data elements, codes and qualifiers).

The future ISO 18186 is being developed by working group WG 2, AEI for containers and container related equipment, within SC 4. The working group has published some important standards regarding automatic equipment identification for containers and related equipment:

- The ISO 18185 series of standards for freight containers electronic seals which aim to enhance cargo security in container transportation
- ISO/TS 10891:2009, Freight containers – RFID – Licence plate tag, which enables electronic information transfer from containers to automatic processing systems. This optimizes the efficiency of equipment control systems and assists in container security initiatives.

The future ISO 18186 will complement the framework of standards developed by ISO/TC 104/SC 4. It will describe how transparency and efficiency in freight container logistics can be improved using RFID cargo shipment tags and Internet-based software. The cargo shipment tag system records container transportation processes and enables online tracking by security authorities.

The RFID cargo shipment tag system would be separate from other container security and identification RFID frameworks, such as the container ‘license plate’ tags described in ISO 10374:1991, Freight containers – Automatic identification, and ISO 10891:2009, Freight containers – Radio frequency identification (RFID) – Licence plate tag, and the ISO 18185 series on electronic seals. The RFID cargo shipment tag defined in this standard can be used separately or with e-seals and license plate tags.

Related International Standards are expected to promote RFID applications for freight container transportation. They are also envisaged to help users select products that make container logistics more transparent, efficient and safe.

Keeping track of the location of these containers is a never-ending concern.

About the author

Qifan Bao, a Professional Senior Engineer and Vice President of Shanghai International Port (Group) Co. Ltd, is project leader of ISO 18186, Freight container – RFID – Cargo shipment tag. He has led several demonstrations of RFID in international container pilot projects, including the China-USA e-tag pilot sailing between Shanghai and Savannah, Georgia, and a China-Canada pilot for food defence.
Of paramount importance

Ensuring traceability of gas cylinders

by Hervé Barthélémé

Gas cylinders enable local use of gases and liquids without the need for costly permanent pressure vessel installations. They are essential to providing complex gas mixes for a wide range of medical, industrial and research uses. These cylinders are manufactured in a variety of shapes and sizes, with the most common configurations providing capacities ranging from 1 to 50 litres. All are controlled by international, regional or national safety regulations requiring clear markings and periodic safety checks and maintenance. Pressure testing requirements vary according to the design of the cylinder and its contents.

A long and changing lifespan

Although manufactured to specific designs for different contents, gas cylinders have a very long lifespan, often exceeding 50 years. During that time, cylinders may contain various gases at different fill pressures. Consequently, the amount of gas held in the cylinders may also vary. It is possible that during their lifetime the regulatory framework controlling their use may also change.

As gas cylinders may store a wide variety of gases, identification is of paramount importance. In fact, more often than not, it is mandatory to uniquely identify each cylinder. Because contents may have a limited shelf life – and to meet product quality and liability tracking requirements – it may be necessary in some circumstances to identify not only the type of gas or liquid, but also details such as filling station, batch and date of fill.

A variety of strategies are used to physically identify cylinder characteristics, such as stamp marking (ISO 13769:2007), colour coding with paint (ISO 32:1977), paper labelling (ISO 7225:2005), card, metal and plastic labelling and bar coding.

Radio frequency identification (RFID) provides an innovative and practical technology for reliably identifying gas cylinders.

Requirements

RFID requires a reader station (also known as an interrogator) that transmits a predetermined signal of inductive, radio or microwave energy to one or many transponders located within a read zone. The signal is then returned in a modified form to the interrogator and the data is decoded.

The encoded data enables unambiguous identification of the transponder. It may also provide a medium for a bi-directional interactive exchange of data between the host and transponder. The signal may be modulated or unmodulated according to the architecture of the system.

In many cases, it will be necessary to use one air carrier frequency and protocol, but this will not be possible, or even desirable, in all situations. It is sometimes useful to separate fundamentally different cylinders by the response frequency.

However, benefits may be found in the use of a common core data structure that is capable of upwards integration. It should be expandable from the simplest low-cost cylinder identification system to more complex functions. Such a structure must be flexible and enabling, rather than prescriptive, to allow different degrees of interoperability, within and between host systems.

Maximizing interoperability

Two widely used standards still gaining in popularity are:

• ISO/IEC 8824-1:2008, Information technology – Abstract Syntax Notation One (ASN.1) : Specification of basic notation

Standard notation ASN.1 is used for the definition of data types, values, and con-
straints on data types. It provides maximum interoperability and conformance to existing standards. Furthermore, ASN.1 meets the specifically defined requirements for a generic standard model for portable gas container identification. It:

- Enables and uses existing standard coding
- Is adaptable and expandable
- Does not include unnecessary information for a specific application
- Has a minimum of overhead in storage and transmission.

Part 2 also facilitates harmonization among different systems. It does not prescribe any one system, and has been written in a non-mandatory style so as to avoid becoming obsolete as technology changes. Data elements forming part of transmission or storage protocols such as headers and checksums are excluded.

**Identification data schemes**

ISO 21007 requires that RFID gas cylinder systems are built around a fixed core or unambiguous identification element. This core element will form the first data set of one (or many) data sets in a gas cylinder environment, using data structures complying with ISO 21007-1. Fixed data schemes covered:

- Numbering (binary)
- Numbering (ASCII).

Optional/additional data schemes included:

- Cylinder manufacturer information
- Cylinder approval information
- Cylinder package information (water capacity, working pressure, tare weight, last test date)
- Cylinder content information (content code, fill date)
- Commercial product information (quantity, quantity unit code, product ID)
- Product lot information (expiration date, lot ID)

**Modern technology** – Part 2: Numbering schemes for radio frequency identification, establishes a common framework for data structure that enables unambiguous identification in gas cylinder applications, and for other common data elements.

As gas cylinders may contain a wide variety of gases, identification is of paramount importance.

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**Harmonizing and defining**

ISO technical committee ISO/TC 58, Gas cylinders, subcommittee SC 4, Operational requirements for gas cylinders, has developed a key multi-part standard enabling RFID application.

The first part, ISO 21007-1:2005, Gas cylinders – Identification and marking using radio frequency identification technology – Part 1: Reference architecture and terminology, includes definitions of more than 60 terms.

The second part ISO 21007-2:2005, Gas cylinders – Identification and marking using radio frequency identification technology – Part 2: Numbering schemes for radio frequency identification, establishes a common framework for data structure that enables unambiguous identification in gas cylinder applications, and for other common data elements.

**As gas cylinders may contain a wide variety of gases, identification is of paramount importance.**

**Barcode vs RFID**

Today, 2D (two-dimensional) bar codes compete with RFID technology for gas cylinder identification. Acquisition time, writing time as well as ease of use are some of the criteria considered when choosing between the two solutions. Harmonized best practice would benefit the end-users of gas cylinders. ISO 21007-1 and ISO 21007-2 are key tools for achieving this harmonization.

**Security elements**

- Accessories information
- Acetylene specifics (porous mass characteristics).

ISO 21007-2 contains a list of gas cylinder manufacturers codes for identification (as part of Annex C).

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ISO 33rd General Assembly

At the invitation of the ISO member for Norway, Standards Norway (SN), ISO will hold its 33rd General Assembly from 15 to 17 September 2010 in Oslo.

As part of the General Assembly, there will be one full-day open session on 16 September on the theme of applied information technologies (IT) for which the need for globally relevant solutions has been recognized.

Associated meetings of the ISO Committee for developing country matters (ISO/DEVCO), the ISO Technical Management Board and ISO Council, will take place in parallel during the week of the General Assembly.

Participation is reserved for representatives of ISO members and invited international organizations.

An interview with Trine Tveter, Managing Director of Standards Norway, giving an overview of SN and the goals for hosting the ISO GA, will appear in the May 2010 ISO Focus+ issue.

Contest for young standardizers

ISO is holding a contest for young standardizers in developing countries and economies in transition.

The purpose of this contest is to encourage young professionals to engage in international standardization and to raise awareness of the importance of standards in promoting safe and sustainable economic development. The theme for the 2010 award is, “Can International Standards help fight climate change?”.

The award is cosponsored by ISO and the Deutsches Institut für Normung (DIN), ISO member for Germany. The award is held every other year under the ISO Action Plan for developing countries. It is named after Professor Helmut Reihlen, former Director of DIN, in recognition of his significant contribution to ISO’s capacity-building activities in developing countries.

The contest is open to permanent employees of standardization institutions in developing countries and economies in transition, members of ISO. Delegates and experts involved in ISO technical work, duly authorized by the ISO member in his/her country, may also participate in the contest.

To take part in the contest, candidates must be under 35 years old and write an essay on the proposed theme and complete the contest entry form. Entries must be submitted to the CEO of the candidate’s national standards body by 10 May 2010. The winner of the first prize (3 000 Swiss francs) will receive the award at the ISO 33rd General Assembly, to be held in Norway in September 2010. Second and third place prizes will also be awarded.

For more information: dev-t@iso.org

International language for energy efficiency and renewables

International dialogue on energy will be facilitated by a future International Standard harmonizing energy efficiency and renewable sources terminology.

The standard will be developed by ISO and the International Electrotechnical Commission (IEC), within the joint project committee ISO/IEC JPC 2, Energy efficiency and renewable energy sources – Common terminology.

The International Standard will identify and define terms used in the field of energy efficiency and renewable energy sources. It will support the metrics, calculation and assessment methods, methodologies and best practice needed by policy makers, industry, standards writers and many other stakeholders.

Currently, 40 countries are involved as participants and observers, eight of which actively participated in the committee’s first plenary meeting. Held in January 2010, the event was hosted by AFNOR (ISO member for France), which holds the Secretariat for ISO/IEC JPC 2.

At the meeting, participants confirmed the scope and title of the committee. Specialized working groups were then established to efficiently tackle the different concepts, focusing either on renewables or energy efficiency.

Chair of ISO/IEC JPC 2, Hervé Lefebvre, commented: “It is clear today that both energy efficiency and the need for renewable energy sources are at the top of the world’s policy agenda. Not only are they important to ensure energy security, but also to reduce greenhouse gas emissions, while enhancing economic development objectives.

“This has drawn a plurality of actors from different sectors: energy, building, industry, transport, agriculture, equipment and network design, services, etc., as well as
public authorities, NGOs, and other stakeholders. Harmonized definitions are in this context a prerequisite to enable the different stakeholders to work together and develop shared tools.

“A globally harmonized standard for terminology in this area is indispensable for progress,” concluded Mr. Lefebvre.

The International Standard is expected to support and facilitate global understanding of energy efficiency and renewable energy sources and contribute to:

- The elaboration of regional and national regulations
- Clarification of relations between providers and clients (procurement, contracts, services)
- Standards writing; coordination between the different standardization technical committees working in related subjects; users’ understanding of the standards and their application.

The next ISO/IEC JPC 2 meeting will be held on 22-24 September 2010.

ISO Secretary-General visits Austria

“Standards support economic development,” underlined ISO Secretary-General Rob Steele during a visit to the Austrian Standards Institute (ASI) in February 2010. “In business, there are many things a manager must consider. What and where are the risks/opportunities? In all these areas, ISO standards can assist,” said Rob Steele, as he went on to explain how standards support and enhance business throughout the business value chain.

During his visit, the ISO Secretary-General met with senior staff of ASI and Austrian Standards plus GmbH (AS+). Among the subjects discussed were current standards topics and developments in international standardization, as well as cooperation in education and training activities.

Austrian Standards Institute (ASI), a member of ISO since 1947, participates in ISO’s policy development committees (ISO/CASCO, ISO/DEVCO and ISO/CO-POLCO), and in 71% of the active ISO technical committees and subcommittees.

ISO President talks business

Standards mean business, was the message of ISO President Alan Morrison during his visits to ISO members DIN (Germany), JISC (Japan) and SNV (Switzerland).

The President emphasized that standards are important now more than ever to bolster recovery as the world emerges from a global financial crisis and recession.

ISO President Dr. Alan Morrison (right) with JISC President Dr. Tamotsu Tomakuchi.

While in Japan, Dr. Morrison had the opportunity to address some 200 Japanese business leaders and further highlight the economic importance of standards.

“ISO standards provide confidence, reduce uncertainty and manage risk in a globalized world. Just as a lever dramatically increases the amount of force you can exert, so International Standards increase desirable characteristics such as quality, environmental friendliness, safety, reliability, efficiency, interchangeability and interoperability — at an economical cost.”

He called on CEOs to get their companies involved in standardization. “CEOs must look beyond their boardrooms, beyond their nation’s borders, and participate in an activity that makes business and strategic sense: the development of International Standards.”

Sustainable business districts

More and more business districts like La Defense in Paris, or the Central Business District in Beijing, are being built everywhere in the world, while existing ones are being drastically refurbished. No longer considered isolated precincts exclusively devoted to business and distant from surrounding urban areas, they are increasingly embracing mixed-use planning, social diversity and sustainable development.

However, in their quest for a more sustainable, responsible and cost-effective blueprint, they have been left largely in the dark. There is currently no guidance on urban planning in International Standards.

Some “clues” may be captured from private declarations, codes of conduct or records of best practice. But often, these fail to take into account the specific characteristics of business districts:

- Dense occupancy with a concentration of high-rise buildings
- Large traffic of people during office hours
- Complex management due to mixed-use and multi-layer structures
ISO 26000 moves forward

The future ISO 26000 standard giving guidance on social responsibility has just passed another important development stage with confirmation that support by ISO’s national members and by participating liaison organizations is strong enough for it to be progressed to a Final Draft International Standard (FDIS). This is the final stage in the development of an ISO standard before it is published as a fully fledged ISO International Standard.

In mid-February, ISO’s national standards body (NSB) members voted in favour of moving the Draft International Standard (DIS) version to FDIS status. However, in order to also assess support from the 42 international liaison organizations participating in the ISO Working Group on Social Responsibility (ISO/WG SR), its leadership reviewed the views and comments of these organizations before formally proceeding to FDIS.

The liaison organizations include associations representing business, civil society NGOs, consumers or labour, and include groupings of both inter-governmental and non-governmental origin. They do not have voting rights, but have actively and directly participated in developing ISO 26000 and commenting on the document.

Following the positive mid-February vote, the leaders of the ISO/WG SR have concluded that there is the requisite support for registering the current document as ISO/FDIS 26000.

With this decision now formally confirmed, the ISO/WG SR will next focus on addressing the 2,650 comments received during the course of the vote from ISO members and liaison organizations in order to increase the level of consensus and the quality of the document even further.

With this objective in mind, the group’s drafting task force will look into all comments received and prepare proposed ways forward on key topics identified for discussion among the ISO/WG SR experts at its next meeting to be held in Copenhagen, Denmark, in May 2010.

After the meeting, a new revised document will be finalized based on the agreements reached in Copenhagen. This document will be circulated as an FDIS for a two-month ballot and, if approved on the FDIS vote, ISO 26000 could be published as an International Standard by the end of this year.

The ISO/WG SR leadership thanked liaison organizations and members for their participation and assured them that all comments will be given a fair and equitable treatment.

ISO 26000 will provide harmonized, globally relevant guidance based on international consensus among expert representatives of the main stakeholder groups and so encourage the implementation of social responsibility worldwide. The guidance in ISO 26000 draws on best practice developed by existing public and private sector SR initiatives and is intended to be useful to organizations large and small in both these sectors.

Business district of La défense in Paris, France.

- Deserted areas at evening and weekends
- Exacerbated security issues, etc.

Many business districts do engage in sustainable development. But there is little, if any, communication between them and with stakeholders. There are no organized schemes to share information, experiences and best practice, follow common principles, elaborate guidelines or assess performance at the district level. That is, until now.

Given this situation, ISO is developing an international workshop agreement (IWA) at the request of Sustainable Network – a France-based non-profit association bringing together business district managers, companies, universities and national standards bodies from the ISO community (such as Canada, China, Czech Republic, France, Italy, Namibia, Poland, Russia and the United Kingdom).

The IWA will provide holistic guidance on how to apply and assess sustainable development principles for the entire business district rather than to each of its individual components – buildings or civil engineering works. It will establish a basis for benchmarking best practice. The IWA is expected to be completed early 2011.

The IWA will help save energy and money. Business districts will no longer need to reinvent solutions that may have proved unsuccessful elsewhere. The IWA will enable innovative actions to better enter the market. By promoting sustainability the IWA will help address pressing environmental issues, such as climate change, that require a collective effort from all of us.

The initiative was launched in Paris, France, in the business district of La Défense in January 2010. The next meetings will take place in Montreal, Canada (May 2010) and Beijing, China (end 2010).

To join the workshop or obtain more information on its work, contact: Bernard Leservoisier, Secretary at bernard.leservoisier@afnor.org
The ISO/IEC 20000 series enables organizations to benchmark their capability in delivering managed services, measuring service levels and assessing performance.

Today, IT service providers are under sustained pressure to deliver high quality service at minimum cost. Concerns have been raised that IT services, whether provided by an in-house IT department or an external organization, are not aligned with the needs of the business and its customers. The ISO/IEC 20000 series helps to reduce operational exposure to risk, meet contractual and tendering requirements, demonstrate service quality and deliver best value.

The implementation of ISO/IEC 20000 will ensure proactive working practices able to deliver high levels of customer service to meet their business needs.

The ISO/IEC 20000 series was launched with the publication of two parts in December 2005. Part 1 provides the requirements for an IT service management system and Part 2 gives guidance on understanding and achieving the requirements.

Practical advice

The third part of the series, a technical report (TR) was published in October 2009. ISO/IEC TR 20000-3 was developed because many organizations find it difficult to define the limits of their IT service management activities, despite this being a necessary first step for any implementation project. Part 3 gives practical advice on defining the scope and applicability of ISO/IEC 20000-1 and on conformity assessment.

It includes realistic, scenario-based examples to explain how the scope may be defined. Many scenarios are based on a wide variety of supply chains, such as the one depicted in Figure 1.

Next due for publication is ISO/IEC 20000-5, which provides an exemplar implementation plan for ISO/IEC 20000-1. The generic plan divides the implementation into what to do first, second and third, finishing with consolidation of all the improvements. Some activities start in the first stage and continue, with refinements, through all stages.

The plan has been designed to be useful for organizations with no formal service management, or those already close to meeting the requirements of ISO/IEC 20000-1. Part 5 includes useful checklists and example documents, such as policies.

The fourth part of the series, ISO/IEC TR 20000-4, Process reference model for service management, known as a PRM, is expected to be published late 2010. It will provide the basis for ISO/IEC 15504-8, Process assessment model for service management, (known as a PAM).

In view of the increasing proportion of organizations going for combined audits against ISO/IEC 20000-1 and ISO/IEC 27001, which gives the requirements for an information security management system, the working group responsible for IT service management is working closely with joint technical committee ISO/IEC JTC 1, Information technology, subcommittee SC 27 on information security, to produce ISO/IEC 27013, Guidance on the integrated implementation of ISO/IEC 20000-1 and ISO/IEC 27001. This is still at an early stage.

In addition, ISO/IEC JTC 1/SC 7, Software and systems engineering, working group WG 23, System quality management, is developing ISO/IEC TR 90006, Guidelines for the application of ISO 9001 to IT service management. This will be based on the second edition of ISO/IEC 20000-1, which is expected to be published in 2011.

About the author

Jenny Dugmore is Convenor of the joint technical committee ISO/IEC JTC 1, Information technology, subcommittee SC 7, Software and systems engineering, working group WG 25, IT service management, the group responsible for the ISO/IEC 20000 series. For more information on the series, contact: jenny.dugmore@service-matters.com.

Figure 1 – An example of an IT service scenario.
One of the primary objectives of ISO 9001, as clearly described in Clause 1.1 of the ISO 9001:2008 standard is “to specify requirements for a quality management system where an organization…needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements…”

In an effort to shift the incorrect focus of some organizations, consultants, auditors and others from concentrating only on the documentation and administrative requirements of ISO 9001, recent strategic initiatives by ISO and the International Accreditation Forum (IAF) have placed a much greater emphasis on the effectiveness of the quality management system in achieving this objective of “consistent, conforming products”.

A recent ISO/IAF joint communiqué on the expected outcomes from accredited certification to ISO 9001 was aimed primarily at emphasizing this point to accredited certification bodies and their auditors, and the mantra, Output matters!, is now part of the everyday lexicon of those involved in conformity assessment of management systems.

But what does this mean to those who purchase goods and services from “ISO 9001-certified” suppliers? Does it mean there is an absolute guarantee that the goods and services provided will always meet the customers’ requirements?

How can a purchaser be sure that its supplier really does have a quality management system (QMS) that meets ISO 9001 requirements and that is relevant to the products it is providing?

What other forms of conformity assessment may be appropriate, other than accredited third party certification?

Where does product certification fit in?

What should customers do if they are not happy with the performance of their suppliers?

With this in mind, ISO has recently updated its informative document, ISO 9001 – What does it mean in the supply chain?, which is available free of charge on the ISO Website www.iso.org/managementstandards.

The objective of this document is not only to generate greater awareness among purchasers about what ISO 9001 can and
cannot achieve, but also to stimulate constructive feedback to those concerned when things do not go according to plan.

The informative brochure was written for an intended audience of purchasers in a business-to-business environment, who are not necessarily certified to or even familiar with ISO 9001. It addresses the main topics outlined below.

- What is ISO 9001?
- The concept of a quality management system
- Relationship between ISO 9001 and ISO 9000
- Main issues addressed by ISO 9001.

**What does “conformity to ISO 9001” mean?**

- How the quality management system relates to supplier performance
- Relationship between conformity to ISO 9001 and declarations of product conformity.

**The brochure was written for purchasers.**

**How does ISO 9001 help you in selecting a supplier?**

- Important factors for the purchaser to consider
- The purchasing information that should be provided so that suppliers clearly understand their customers’ needs
- The ways in which supplied products can be verified as meeting the requirements of the customer.

**How can purchasers be sure that the products they receive will meet their requirements?**

- Level of confidence needed in the supplier’s ability to provide conforming product on a consistent basis
- Reputation and historical performance of the supplier
- How to be sure the supplier actually does have a quality management system that meets ISO 9001 requirements
- Need to check that the goods and services being provided are covered within the scope of the supplier’s quality management system.
Dr. Nigel H. Croft has been involved in many aspects of quality management and conformity assessment during a career of over 35 years. He is currently a lead consultant for the United Nations Industrial Development Organization (UNIDO) and also serves as a director and/or non-executive board member of a number of commercial and non-profit organizations in Europe, the Middle East, Asia and South America.

Dr. Croft was the founding Co-chair of the ISO 9000 Advisory Group, which developed the original version of the informative document, that this article describes. He has recently been appointed Chair of subcommittee SC 2, which is responsible for developing the ISO 9001 and ISO 9004 standards, of ISO/TC 176, Quality management and quality assurance.

How can you have confidence that your supplier meets ISO 9001?

This section of the document guides the purchaser through the many ways in which a supplier can legitimately claim to have a quality management system that meets the requirements of ISO 9001, and the characteristics of each. They include (see also Figure 1):

- Supplier’s declaration of conformity
- Second party assessment
- Non-accredited third party assessment
- Accredited third party assessment.

Can suppliers claim that their goods or services meet ISO 9001?

This part of the document explains that ISO 9001 refers to quality management systems, and not directly to goods and services supplied. A quality management system meeting the requirements of ISO 9001 should provide confidence in the supplier’s ability to provide consistent, conforming goods or services, but should not be taken to imply a guarantee of the products themselves.

What to do if things go wrong

This part of the brochure is intended to stimulate the appropriate feedback channels from customers to their suppliers and, if necessary, to the certification body and accreditation body responsible for the certification.

What should customers do if they are not happy with their suppliers?

It stresses that the first line of communication should be between the customer and the supplier, using the normal channels that have been established.

If, however, there are repetitive problems with the overall performance of the supplier – for example, if it continues to provide non-conforming products, does not address customer complaints, or is not taking appropriate corrective actions – then this is an indication of problems in the supplier’s quality management system.

In such cases, it may be appropriate to escalate the complaint to the supplier’s management representative, to the certification body, or in extreme cases to the relevant accreditation body, or even the IAF.

Full potential

The informative brochure that is now available on the ISO Website provides purchasers with the information needed to ensure that the ISO 9001 standard is used to its full potential in the business-to-business supply chain.
Cornell ensures milk quality

8 000 farms benefit from ISO/IEC 17025

by Ynte Schukken

Cornell University’s milk quality programme is now claimed to be the most qualified in North America following successful ISO/IEC 17025 accreditation of its testing laboratory serving the milk safety and quality needs of some 8 000 farms in the states of California, Maine, Massachusetts, New Hampshire, New York, Ohio, Pennsylvania and Vermont.
and milk inspectors to its most important customer, the consumer. The 63-year-old lab employs a staff of 40 veterinarians, microbiologists, technicians and office staff serving the needs of about 8 000 farms.

Why accredit?

There were several reasons behind our decision to implement ISO/IEC 17025:2005. First of all, we want to be recognized among the best milk quality laboratories in North America. Secondly, it quickly became clear that implementation of a stringent quality assurance system had many unexpected benefits for managing a complex organization.

The ultimate benefits outweigh the costs.

Finally, performing such an involved task turned out to be a great team-builder in our organization.

ISO/IEC 17025:2005 implementation and accreditation was a five-year process. As a starting point, we assembled an implementation and review team headed by the AHDC Quality Assurance Manager who is a qualified assessor for the American Association for Laboratory Accreditation (A2LA), and performs laboratory assessments according to ISO/IEC 17025:2005 and Good Laboratory Practice (CFR21 Part 58) Food and Drug Administration (FDA) requirements.

He was supported by the Milk Programme Director, the Associate Director/Quality Manager, the Laboratory Supervisor, QA Assistant, Project Manager, and the Administrative Manager to promote the quality system management philosophy and methodology. We also hired an external quality systems consultant to provide ISO/IEC 17025:2005 internal auditor training for team members.

Five stages

Once the team was in place and trained, the implementation and accreditation process followed five key stages:

• Training of laboratory personnel in background information on ISO quality management standards, why and how to promote quality, and familiarity with ISO/IEC 17025:2005 requirements

• Developing the QMPS Quality Manual and quality, operating and work area procedures

• Implementing the quality system through internal audits, management reviews and the use of corrective and preventive actions to drive continual improvement

• Hiring a consultant to perform an objective assessment

• Continuing the process of self-monitoring to achieve continual improvement.
Standards in Action

About ISO/IEC 17025

As of January 2010, some 34,234 testing and calibration laboratories worldwide had become accredited to ISO/IEC 17025:2005, General requirements for the competence of testing and calibration laboratories. However, its influence is even greater than this figure suggests since many countries make its use a legal requirement.

This standard has become the international benchmark counted on by business and governments worldwide to provide assurance of the technical competence of laboratories that play a vital role in trade, product development and manufacturing, and consumer protection.

In addition, documents derived from it are used by laboratories in specific sectors, such as medicine and microbiology.

ISO/IEC 17025:2005 contains all of the requirements that testing and calibration laboratories need to meet in order to demonstrate to customers and regulators that they operate a sound management system which puts them in full control of their processes, they are technically competent and are able to generate technically valid results.

We made only minimal changes in procedures, equipment or staff qualifications during the implementation period to meet ISO/IEC 17025:2005 requirements. However, innumerable work forms were developed, tried, corrected and adapted to facilitate recording of laboratory procedures. At the same time, corrective action reports and preventive action reports were created to drive and facilitate improvement.

Benefits

We have seen numerous early benefits from ISO/IEC 17025 accreditation, particularly in the recognition of our programme within Cornell University, the State of New York, and the country. Many individuals have provided feedback about obtaining ISO/IEC 17025:2005 accreditation, and all the input has been uniformly positive.

When we started, many scare stories surfaced about quality assurance, including predictions of increased costs and staffing. Even though the process of implementing ISO/IEC 17025:2005 is extensive and time-consuming, the ultimate benefits outweigh the costs.

We have seen numerous early benefits from ISO/IEC 17025 accreditation.

In our experience, day-to-day operating costs of our facility have not increased discernibly. The extra cost of running a tight quality assurance system is balanced by fewer errors and by the virtual elimination of unexpected events.

About the author

Prof. Ynte Schukken is Director of Quality Milk Production Services and Professor of Epidemiology and Herd Health, Department of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine, Cornell University. He graduated from the University of Utrecht, The Netherlands, in 1990, with a Ph.D in epidemiological studies and joined Cornell in 1999.

His current research interests concern infectious diseases in animal populations, udder health in dairy herds, and the application of epidemiological, statistical and mathematical methods to animal disease research. A list a list of published papers authored by Prof. Schukken can be found on [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov).

Building trust is a comprehensive, user-friendly handbook covering all aspects of conformity assessment and its role in international trade, and will be useful for business managers, regulators and consumer representatives.

The book’s Preface is contributed by ISO Secretary-General, Rob Steele, and UNIDO Director-General, Kandeh K. Yumkel-la, who write: “Businessmen, consumers and public officials have certain expectations about the quality, safety, reliability, interoperability, efficiency, effectiveness and environmental sustainability of products and services.

“Conformity assessment provides the means for testing the compliance of such products and services with these expectations, in accordance with relevant standards, regulations and other specifications. It helps to ensure that products and services deliver on their promises. In other words, conformity assessment builds trust.”

However, non-acceptance of test reports and certificates of conformity continues to be an obstacle to international trade. Successive reviews of the World Trade Organization’s Agreement on Technical Barriers to Trade have noted the usefulness of the conformity assessment standards and guides developed by ISO and the International Electrotechnical Commission (IEC) in harmonizing conformity assessment practices and as benchmarks for the technical competence of assessment bodies.

The use of these standards and guides therefore helps to overcome trade barriers. UNIDO, meanwhile, has acquired more than 40 years of experience in supporting the establishment and upgrading of standards and conformity assessment structures worldwide.

*Building trust* covers the following aspects of conformity assessment:

- Basic concepts
- Conformity assessment techniques
- Conformity assessment schemes and systems
- Conformity assessment bodies
- How UNIDO can help with setting up a quality infrastructure
- Case studies
- ISO Committee on conformity assessment, ISO/CASCO
- Coordination of accreditation bodies
- Conformity assessment and the WTO Agreement on Technical Barriers to Trade.

The handbook is the latest in a series of joint publications issued by ISO and UNIDO, and is the result of the long-standing and fruitful partnership between the two organizations to strengthen the standardization and quality infrastructures of developing countries and countries with economies in transition. Although aimed specifically at this group of countries, these publications are also intended to serve as handy reference tools for all who are involved or interested in conformity assessment and trade.

*Building trust – The Conformity Assessment Toolbox* is available in English (189 pages, ISBN 978-92-67-10511-6) and French (211 pages, ISBN 978-92-67-20511-3) editions. It is available free of charge (fee for postage and handling) from the ISO Central Secretariat through the ISO Store or by contacting the Marketing, Communication and Information department (*sales@iso.org*). It can also be obtained from ISO national member institutes. The handbook can also be downloaded as a PDF file free of charge from the ISO (www.iso.org) and UNIDO (www.unido.org) Websites.

Roger Frost is Head, Communication Services, ISO Central Secretariat.
Any organization may claim to have developed a “standard”, but “not all standards are created equal”, states ISO in a new brochure clarifying the distinctions between International Standards of the type developed by the ISO system, using well described and accepted principles and disciplines, and “private” standards developed by industry consortia and potentially other groupings.

The context for the brochure, *International Standards and “private standards”*, is the concern over the potential of increasing numbers of “private standards” for creating technical barriers to trade and confusion in the market-place as to which standards should be used.

ISO warns that the existence of a growing multitude of private standards in such fields as information and communication technologies, agri-food, and on social and environmental issues, may ultimately confuse users and consumers, thereby diminishing their important market, safety, social or environmental effect.

“In addition,” states ISO, “claims of conformance, using potentially inconsistent methodologies for their assessment, may also undermine the intended impacts of such private standards.”

ISO is a nongovernmental organization and its membership comprises the national standards institutes of 159 countries who, in turn have strong links with stakeholders from industry, government and consumers. Such a broad range of stakeholders, along with the robust processes ISO uses for developing standards, provides the basis for consensus across sectors and countries on its International Standards.

ISO points out in the brochure that its International Standards are developed according to principles stipulated by the World Trade Organization’s Technical Barriers to Trade Committee (WTO/TBT):

- Transparency
- Openness
- Impartiality and consensus
- Effectiveness and relevance
- Coherence
- Addressing the concerns of developing countries.

Other standards developed to meet the needs of specific sectors, or segments of the population, may be perfectly valid and relevant for their purpose, but should not be considered as equivalent to ISO standards because they do not adhere to the above criteria, nor do they share all of the other attributes of formal international standards.

However, because ISO’s voluntary standards do meet these criteria, as do those of its partner organization the International Electrotechnical Commission (IEC), their standards can, for example, be used by governments as technical support for public policy and regulations, particularly in such fields as health, safety and the environment.

“Coherence, harmonization and a closer level of cooperation between the developers of private standards and the formal International Standards system needs to occur,” ISO states in the brochure, concluding, “Ultimately, the goal of one International Standard, one test and one certificate should be pursued in these domains in order to achieve global acceptance, as well as their intended impacts.”

*International Standards and “private standards”*, eight pages, A4 format, is published in English (ISBN 978-92-67-10518-5) and French editions (ISBN 978-92-67-20518-2). It is available free of charge (fee for postage and handling of bulk orders) from the ISO Central Secretariat through the ISO Store or by contacting the Marketing, Communication and Information department (sales@iso.org). It can also be obtained from ISO national member institutes. The brochure can also be downloaded as PDF file free of charge from the ISO Website (www.iso.org).

Roger Frost is Head, Communication Services, ISO Central Secretariat.
As the use of fish and wood products (including as energy sources) continues to grow, they are fast becoming the world’s most traded commodities in their respective fields. At the same time, both sectors, crucial to biodiversity, are facing the pressing threat of climate change.

Consortium-based International Standards are powerful tools for taking action. The May issue of ISO Focus+ will highlight the contribution they can make to supporting the three pillars of sustainable development – economic, social and environmental – in the forestry, fisheries and aquaculture sectors.

ISO’s contribution to timber structures, for instance, has already lead to a globally harmonized testing methodology. It has driven international cooperation for the development and implementation of strategies optimizing the sound utilization of forest resources.

In contrast, seafood is the number one traded food in the world and most countries are, to some degree, active in the fisheries and aquaculture sectors. ISO technical committee ISO/TC 234, Fisheries and aquaculture, is currently developing much needed International Standards for the sector, which we will learn about in the next issue of ISO Focus+.

Today, businesses looking to improve the environmental impact of their products and services must take account of globally recognized standards. ISO has been a very active player, developing, among others, standards for environmental or “green” labelling. Its work in this area covers self-declared environmental claims, eco-labelling schemes and life cycle labelling. Because ISO standards take the views of all stakeholders on board, they are internationally recognized as representing objectively agreed benchmarks.

The May issue of ISO Focus+ showcases stories from companies benefiting from ISO standards. Among them, a Namibian fish processor that gained greater customer confidence in global marketplaces by implementing management systems standards for environment and food safety as well as occupational health and safety.

Similarly, a large Brazilian company on the paperboard market tells us the key role ISO quality and environmental standards play in its success story. ■

Guest interview

In an exclusive interview, Pieter Burghout, CEO of the Building Research Association of New Zealand (BRANZ) tells ISO Focus+ about the challenges faced by the industry and the role of International Standards in promoting the economic development of the building and construction sector.

He explains why participation in the standardization process is important to his company, “BRANZ participation in ISO/TC 92/SC 4, and its associated working groups helps to ensure that information developed for the New Zealand building sector will be relevant to our industry.

“ It also provides an important opportunity for the New Zealand industry, via BRANZ, to benefit from international linkages by working closely with other international experts in this field, as well as providing an opportunity to learn from and influence international directions in fire safety engineering,” he says.

To learn more, don’t miss the May issue of ISO Focus+.

■

Photo: BRANZ

Pieter Burghout, CEO of BRANZ

Forestry and fisheries
Wouldn’t it be great to feel strong, calm, ready for anything?

ISO has standards that can help.

We’ve all met managers who like to pass themselves off as “real tigers”. But bluster can often be a mask for a lack of confidence. Real confidence comes from knowing you have done all in your power to prepare your organization for anything that an uncertain world can throw at it. And the power of confidence can be developed by implementing the ISO 31000 series for risk management. These standards enable organizations of all types and sizes, in both public and private sectors, to manage risk effectively. They can make all the difference between paper tigers and the real thing.

ISO 31000:2009, Risk management – Principles and guidelines
ISO/IEC 31010, Risk management – Risk assessment techniques

Available from ISO national member institutes (listed with contact details on the ISO Web site at www.iso.org) and from the ISO Central Secretariat Webstore at www.iso.org/isostore or e-mail to sales@iso.org.