

ISO Focus+

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Future gear



- **What they want from ISO :**
Audi, Bentley, Chrysler, Fiat, Kia, and more...



ISO Focus+

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Coming Up

International Standards

The future gear

The global automotive sector is undergoing a radical transformation. Thirty years ago, no one would have anticipated the extent or the speed at which the industry would change: goodbye gas-guzzlers, hello high-tech, high-efficiency vehicles.

What future events will contribute to further changes? How can we prepare for the best or worst case scenarios? One thing is for certain: with growing social and environmental pressures, not to mention economic pressure to cut costs, the automotive industry will continue to evolve. To drive the outcomes and ensure the best possible result, it must not rest on its laurels.

Today's vehicle is "connected" – designed to maximize safety, mobility and productivity. It involves several highly interactive interactions: car-to-car, car-to-infrastructure, infrastructure to infrastructure communication, and technology (global system for mobile communication, digital radio, 5.9 Ghz, dedicated short-range communications). Of all the potential benefits of the connected vehicle, perhaps none ranks higher in the public's consciousness (or conscience) than technologies capable of increasing personal and public safety.

The convergence of all these interactions, in both the vehicle and the infrastructure, is leading to the realization of active safety. For example, technology today enables enough positional accuracy and rapid communication to allow vehicles in the same place at the same time to avoid a collision. So why, therefore, is it not being used? Quite simply, the connectivity capabilities of the infrastructure are not yet available.

While the adoption of the connected vehicle holds promise for safety, perhaps the most significant gains are yet to be achieved in terms of mobility. By 2030, the people of the world will be driving as many as two billion cars – up from one billion today – according to industry figures. As the number of vehicles on the

road increases, so will congestion – greatly raising the volume of emissions.

Research shows a 10% decrease in congestion during peak traffic hours translates into a 2% increase in regional GDP and a 3% increase in jobs. Few investments today can have such an impact as reducing congestion.

If you thought the technology itself would help save lives and lead to more environmentally friendly vehicles – you thought wrong. Indeed, the industry has made great strides to focus on the accelerated development of advanced high-efficiency vehicles. However, the concern is not with the availability of technology – because it obviously exists – but that its implementation and the associated infrastructure are lagging behind. In other words, the full potential of technology is useful insofar as it is being implemented.

*Today's vehicle is
"connected".*

The main question that needs answering is what would it take to generate the political and social will to implement such solutions? What is holding us back? Is it any longer acceptable that so many people are injured or killed on the world's roads because of the lack of financial backing? If improving safety, mobility or the environment is the motivation – which it obviously is – expenditures on connected vehicles and infrastructure promote a win-win situation by providing a positive impact on all three areas. Bottom line: there is no other investment that can do the same.

To ensure the industry's success in the next 30 years, a far wider market must be

accessed, with lower cost technologies being supported by implementation incentives and an infrastructure that exists and works. The ISO President's Forum at the end of 2011 provided a unique opportunity for the automotive industry to engage with ISO and other standards-developing organizations, and discuss the needs and priorities for International Standards in the sector in the coming years.

International Standards developed by ISO technical committees ISO/TC 22, *Road vehicles*, and ISO/TC 204, *Intelligent transport systems*, will play an important part in the future. Clearly, state-of-the-art standards enable the widespread dissemination of automotive technology, helping to ensure its integration and interoperability with existing infrastructure, while concurrently generating significant social and economic returns. And as Chairs of these two committees, we are proud to play a part in this process.

From our end, the issues facing the industry's future must be addressed on the basis of an integrated approach, involving not only automakers but also government and consumers. And we will continue to do our share by developing timely, best practice guidelines – the industry's future and our planet's sustainability depend on it. ■



Michael Noblett, Chair of ISO/TC 204 (left), and Michel Potvin, Chair of ISO/TC 22.



Participants at the ISO 28000 seminar held by the Port Training and Research Institute of Le Havre, France.

ISO 28000 training for women port managers

Some 20 African and Haitian female port managers received training on ISO 28000:2007, *Specification for security management systems for the supply chain*, as part of a two-week seminar on port management held in December 2011 at the Port Training and Research Institute (IPER) of Le Havre, France.

A case study on ISO 28000 for the port of Le Havre was on the agenda among other topics such as analysis of the economic environment and international logistics, legal frameworks, port finance basics, the supply chain, planning, tariff structures, the operational organization of a container terminal, statistics and marketing.

This training gave participants a practical approach to port safety as a link in the supply chain and provided knowledge of security implementation within the framework of a management system such as that described in ISO 28000.

In addition to improving the efficiency of port management and operations, this training allowed the participants to share experience on their best practices.

This third edition of the seminar dedicated to female port managers was organized under the aegis of the International Maritime Organization (IMO). The purpose of this seminar is to facilitate equal development opportunities within their respective structures. ■

ISO 26000's stock rises in Hong Kong

The Stock Exchange of Hong Kong Limited, a wholly owned subsidiary of Hong Kong Exchanges and Clearing Limited, published a consultation paper on an Environmental, Social Governance (ESG) Reporting Guide in December 2011. This consultation paper proposes to introduce an ESG Guide to encourage reporting. It seeks views and comments on the proposed ESG Reporting Guide for issuers listed in Hong Kong.

The Stock Exchange of Hong Kong generally supports developments in the social sphere and encourages those issuers who are capable of doing so to adopt ESG reporting based on international guidelines and standards such as ISO 26000:2010, *Guidance on social responsibility*.

ISO 26000 addresses seven core subjects of social responsibility, providing guidance and proposals for integrated reporting, in order to link an organization's strategy, governance and financial performance to the social, environmental and economic context within which it operates. ■



Slippery roads: new regulation for tyre performance

A new European Regulation R1235/2011 amending R1222/2009 for tyre labelling for light truck and van tyres (C2 category) and for truck and bus tyres (C3 category) is using as its basis a recently published ISO standard for tyre performance. The labelling is intended to allow the commercial vehicle user to be informed about the wet grip performance of tyres prior to purchase.

ISO 15222:2011, *Truck and bus tyres – Method for measuring relative wet grip performance – Loaded new tyres*, was also presented to World Forum for Harmonization of Vehicle Regulations (WP.29) in September 2011 to possibly fill the existing gap in UNECE R117 where wet grip requirements have not been established to guarantee a minimum performance level for truck, bus and light truck tyres.

ISO 15222:2011 describes testing procedures for the evaluation of the relative wet grip performance of truck, bus, light truck and van tyres using a standard reference testing tyre (SRTT). It thus completes ISO 23671:2006, *Passenger car tyres – Method for measuring relative wet grip performance – Loaded new tyres*.

The ISO 15222:2011 method prescribes three available ASTM standard reference tyres to cover the testing requirements for:

- Wide tyres
- Narrow tyres whose section width is less than 285 mm
- Those with a rim code of 17 and lower.

The test track definition is the same as that in ISO 23671:2006. Appropriate testing conditions for buses, trucks, light trucks and vans are also defined. ■



Durban Climate Change Conference

The United Nations Climate Change Conference, Durban 2011, South Africa, delivered a breakthrough on the international community's response to climate change. In the second largest meeting of its kind, the negotiations advanced, in a balanced fashion, the implementation of the Convention and the Kyoto Protocol, the Bali Action Plan, and the Cancun Agreements.

The outcomes included a decision by parties to adopt a universal legal agreement on climate change as soon as possible, and no later than 2015. The President of COP 17/CMP 7 Maite Nkoana-Mashabane said: "What we have achieved in Durban will play a central role in saving tomorrow, today."

ISO greenhouse gas standards such as ISO 14064 and ISO 14065 have been given wide coverage by international climate organizations, including the International Emissions Trading Association (IETA) and the United Nations Framework Convention on Climate Change (UNFCCC), as potential foundational standards for harmonizing other standards and programmes.

The Durban meeting was another platform to promote, particularly with key industry and non-governmental partners, the foundational role that ISO standards are playing in contributing to mitigating climate change and achieving a truly sustainable world. ■

Sergio Marchionne

Chrysler Group and Fiat



Sergio Marchionne is Chairman and Chief Executive Officer of Chrysler Group LLC, Chief Operating Officer at NAFTA, CEO of Fiat S.p.A., and Chairman of Fiat Industrial S.p.A, including CNH, Iveco and FPT Industrial. His relationship with Chrysler dates back to 2009 when he was appointed Chief Executive Officer, a post he still holds. At Fiat, Mr. Marchionne continues to fulfill the roles of Chief Executive Officer, Fiat Group Automobiles (2005 to present), Chief Executive Officer, Fiat S.p.A. (2004 to present) and Board Member, Fiat S.p.A (2003 to present). In addition, he is also

Chairman of SGS and has been Chairman of CNH since 2006.

In 2010, he joined the board of directors of Exor S.p.A. Mr. Marchionne is also a Board Member of Philip Morris International Inc. and a member of the General Council of Confindustria (the main organization representing Italian manufacturing and services companies), of Assonime (the association of Italian joint stock companies), and of ACEA (European Automobile Manufacturers Association). He is a permanent member of the Fondazione Giovanni Agnelli. He is also a Board Member of the Peterson Institute for International Economics and Chairman of the Italian Branch of the Council of the United States in Italy. He has previously served as the non-executive Vice Chairman and Senior Independent Director of UBS.

Mr. Marchionne holds a BA in Philosophy and Economics from the University of Toronto, and an LLB degree from Osgoode Law School, York University, Toronto. He also has an MBA and B.Com from the University of Windsor, in Canada. Additionally, Mr. Marchionne holds many honorary degrees from leading universities around the world. Mr. Marchionne has also been awarded the Italian honour of *the Cavaliere del Lavoro*.

ISO Focus+: What is the strategic value of International Standards to big industrial groups like Fiat and Chrysler that operate in so many countries with an international workforce of more than 190 000 people?

Sergio Marchionne: We do need standards; the world needs standards. Standards help an enterprise manage business-critical issues, such as quality, environmental performance and safety.

The world needs standards.

A particular region of the world might have different regulatory standards than another one, but the use of International Standards forces us to judge our operations against the best in the world and steers us toward the use of best practices to accomplish business requirements.

ISO Focus+: You are known for turning around both Fiat and Chrysler and making them profitable companies and leading global players in the automotive industry. What is the secret of your success, and



2012 Fiat 500C.

what part did International Standards play in helping you achieve this?

Sergio Marchionne: One thing I have learned as a CEO is that culture is everything. Fiat and Chrysler have adopted a culture that involves a commitment to meritocracy and excellence, the search for and cherishing of change, and the clear acknowledgment that we are accountable for our choices. International Standards are

perfectly consistent, and reinforce these values. Aligning standards is one of the most important efforts Fiat and Chrysler are making in order to bring our organizations together.

The opportunity for innovation and standards need to go hand in hand.



Ferrari California Convertible.

Photo : Motor Trend



Chrysler Group's Headquarters in Auburn Hills, Michigan, USA.

ISO Focus+: Can you describe the use made by FIAT of ISO's management system standards – ISO 9001:2008, ISO/TS 16949:2008 and ISO 14001:2004 – and what value they have added? Have you considered the implementation of other management system standards, such as ISO 50001 for energy management?

Sergio Marchionne: By embracing International Standards, we are able to incorporate third-party evaluation by unbiased auditors who look at different operations around the world.

Standards help an enterprise manage business-critical issues.

This provides us with important information that helps inform our own decision-making. The energy management systems of five group plants are already ISO 50001-certified and by 2014, all of our principal plants, which represent 92% of the energy consumed by Fiat-Chrysler, will be ISO 50001-certified.

We have also set specific targets for each sector to reduce the energy consumed (per unit value up to 30 % compared with 2009 levels) and carbon dioxide emissions (per unit value up to 35 % compared with 2009 amounts) by 2014. All these efforts are part of our ongoing commitment to a sustainable management of our industrial processes.

ISO Focus+: Hundreds of experts in the automotive industry participate in the development of standards. What is the added value of this involvement for the industry in general, and for Fiat, in particular?

Sergio Marchionne: By helping develop standards, you ensure they are fair and that the bar is set high. You do not want to have an “easy” standard that anyone can reach. Standards are beneficial because they help an organization focus on best practices. Those just developing programmes can benefit by using standards to help bring themselves up to the level of the world’s best.

ISO Focus+: In a company like FIAT which has a strong propensity toward technological innovation for its products and production processes, how do

Chrysler Group LLC

Chrysler Group LLC, formed in 2009 from a global strategic alliance with Fiat S.p.A., produces Chrysler, Jeep, Dodge, Ram, SRT, Fiat and Mopar vehicles and products. With the resources, technology and worldwide distribution network required to compete on a global scale, the alliance builds on Chrysler Group’s culture of innovation, first established by Walter P. Chrysler in 1925, and Fiat’s complementary technology that dates back to its founding in 1899.

Headquartered in Auburn Hills, Michigan, USA, Chrysler Group’s product lineup features vehicles such as the Chrysler 300, Jeep Wrangler, Dodge Challenger and Ram 1500. Fiat, of Italy, contributes world-class technology, platforms and powertrains for small- and medium-size cars, allowing the Chrysler Group to offer an expanded product line including environmentally friendly vehicles.



2012 Chrysler 300.

International Standards allow the industry to move forward? What new standards are needed to encourage innovation further?

Sergio Marchionne: The opportunities for innovation and standards need to go hand in hand. It is the only way to advance innovation and address seriously the great challenges of pollution, security and energy savings. There are many examples of available technologies that have not found their way to the market because

it was missing an agreement as to what standard should be used.

*Five group plants
are already
ISO 50001-certified.*

The E-Call, a system that sends an emergency call and location of a vehicle if it is



2012 Ram 1500.

involved in a severe accident, is just an example in Europe. Another one involves rules about the installation of compressed natural gas (CNG) pumps that, until they were removed two years ago, limited the spread of environmentally friendly CNG-powered vehicles.

ISO Focus+: When you're a global brand like FIAT, you no doubt need to pay close attention to your "corporate citizenship". What's your perspective on the contribution of International Standards toward helping the international community to tackle global challenges such as climate change, sustainable development and social responsibility?

Sergio Marchionne: For a business to be respected, it needs to respect the environment and be socially responsible. Standards



2012 Chrysler 300 interior.



Photo : Motor Trend

2012 Jeep Grand Cherokee SRT8.

that focus on these important challenges provide organizations with a framework against which their level of engagement in socially responsible behaviors can be measured.

Standards are beneficial because they help an organization focus on best practices.

In addition, standards in areas such as energy management combine the benefits of a business management tool linking energy management and business processes with the ability to meet growing global customer requirements for reduced greenhouse gas emissions and achieve tangible economic benefits through energy savings.

ISO Focus+: As Chairman of SGS, one of the world's leading certification bodies, how do you see the future of certification to ISO management system standards?

Sergio Marchionne: Every organization is under growing pressure to create value for their customers, stakeholders and employees. This pressure continuously calls for better capabilities to innovate, manage risk, improve performance, comply with the regulatory environment, develop talents, enhance customer and supplier relationships and improve sustainability. Reliable management system standards are needed to help meet these diverse challenges and achieve tangible business benefits. ■



Photo : Motor Trend

Ferrari FF.



Photo : Motor Trend

Ferrari FF steering wheel.



In the fast-lane

Driving forward a new standards agenda

by Elizabeth Gasiorowski-Denis

Automotive technology is becoming more and more complex. Customers today not only demand more comfort and less fuel consumption, but also safer cars equipped with the latest information and communication systems.

Today's advanced capabilities in response to those demands give the potential for vehicles to foresee and avoid collisions, transmit their positions – including to emergency services in case of an accident – navigate the quickest route to their destination, make use of up-to-the-minute traffic reports, identify the nearest available parking slot, minimize their carbon emissions and provide multimedia communications.

However, the automotive sector is currently trying to navigate through a difficult series of "potholes and bumps" in the road. You do not need to have a GPS to understand that the global financial crisis, energy challenges, changing customer attitudes and evolving government mobility policies are all having drastic impacts on today's automotive industry. How will the industry evolve over the coming decades?



How can International Standards support the development of “the car of the future”?

These were two of the key questions driving discussion at a high-level industry forum of automotive leaders and distinguished guests organized by ISO in December 2011, and attended by Mikhail Gorbachev, the former Soviet President and winner of the Nobel Peace Prize.

Given that more than a billion road vehicles are estimated to be in use worldwide today, if the automotive sector uses state-of-the-art standards for aspects such as safety, performance, impact on the environment, and requirements for supply chain partners, this can have an enormous impact on all three dimensions of sustainable development – social, environmental and economic.

The ISO President’s Forum on the Future of Vehicles provided a unique opportunity for the automotive industry to engage with ISO and other standards-developing organizations, and to discuss the needs and

priorities of International Standards in the sector in the coming years, building on the many successes achieved so far.

Some 35 automobile industry leaders from companies such as Audi, Daimler, Renault, Volkswagen, and Volvo provided direct input on what standards are needed to meet the challenges of the industry and those of its customers and stakeholders. Moreover, at least eight standards developing organizations were represented at the Forum.

There was overwhelming agreement among participants that standards are a primary enabler of the widespread dissemination of car technology, helping to ensure its integration and interoperability with existing infrastructure, while concurrently generating significant social and economic returns. Of course, there are areas for improvement, and perhaps none ranks higher in the industry’s consciousness than standards capable of global implementation.

The February 2012 issue of *ISO Focus+* highlights how International Standards can help build the car of the future. It also explores some of the main concerns of the industry, such as pollution and the cost of oil, with articles on ISO standards for hybrid and electric cars and alternative fuels.

Most importantly, the February issue brings together global leaders in the automotive industry, giving a firsthand account of their expectations for today and tomorrow. Exclusive interviews with Mikhail Gorbachev, internationally renowned car guru Richard Parry-Jones, Geneva International Motor Show Director, André Hefti, and Chairman and CEO of Chrysler Group, CEO of Fiat and Chairman of Fiat Industrial, Sergio Marchionne, highlight the key issues and priority areas for the industry and how ISO standards can help. ■

Elizabeth Gasiorowski-Denis is Editor in Chief,
ISO Focus+.

Mikhail Gorbachev

Nobel Peace Prize laureate



Mikhail Gorbachev was the last head of state of the Soviet Union, having served from 1988 until its dissolution in 1991.

He was awarded the Nobel Peace Prize “for his leading role in the peace process which today characterizes important parts of the international community” in 1990.

ISO Focus+: At the ISO President’s Forum on the Future of Vehicles in Geneva, you spoke to industry leaders about the real issues of concern to automotive transport. Can you expand on this?

Mikhail Gorbachev: The problems of automotive transport have long since ceased to be purely technical or economic. These problems encompass nearly everything that worries us in today’s world.

Leaders in the automotive industry are now demonstrating greater understanding than simply developing the sector in a linear manner, i.e. increasing productivity and developing new markets – that may lead to a dead end.

Today, 95 % of cars run on oil.

Even as far back as 1992, when meeting with the former US Secretary of State, George Shultz, and a group of scholars at Stanford University, I asked the following question : from the standpoint of resources and the environment : “Would it be acceptable if developing nations, with their billions of people, copy the West’s current development trajectory of increasing production and consumption ? Would our planet be able to withstand such a burden ?”

Today, we are calling the current situation a crisis of the entire economic model based on maximum profits and hyper-consumption. It has become even clearer that the possibility I spoke about at Stanford is inadmissible.

Photo: Magali Girardin/ISO



Naturally, the current model cannot simply be liquidated or changed overnight. However, we must emphatically seek new approaches, which will serve to form an alternative model, and the automotive sector can play an important role in this.

Today, 95% of cars run on oil. In 20 years, there has not been any significant reduction in average fuel consumption.

I know that in the automotive industry, there is an ongoing search for technical solutions to make cars lighter, more aerodynamic and more economical, and to make the factories producing them more compact and cleaner. This is very important.

ISO Focus+: To what extent has the automotive industry evolved to meet today's needs and how must it better serve its growing customer base?

Mikhail Gorbachev: If you look ahead, you must take into account that society and the environment will put increasing pressure on the automotive culture itself. After all, the world should not be held hostage by the automobile. Over the course of the 20th century, the automobile has crowded out people, and we are witnessing a situation where cars are not serving people so much as people are serving cars. And if we already have one billion cars in the world today, then I do not think we should hasten the production of a second billion.

Naturally, we are not trying to put everyone on trams or bicycles in the immediate

We are not trying to put everyone on trams or bicycles in the immediate future.

future, but in my view there is a clear movement in this direction and the automotive industry must not fear this. The demand for their products will be maintained in a new framework and under different conditions, and we must prepare for the future, because whether we like it or not, it will come.

ISO Focus+: What is the business case for investing in socially and environmentally responsible actions that may not be immediately beneficial to productivity or the bottom line or economic success in a competitive market?

Mikhail Gorbachev: The technical and human potential concentrated in the automotive industry is enormous, and if we relate it to modern trends and social needs, it can be used to work profitably and responsibly. There was a time when the industry was among the first to demonstrate social accountability through collective



agreements with unions, medical and social programmes, etc., and it only benefited from this. Now, it is time to demonstrate environmental responsibility. Ultimately, everyone will benefit from this.

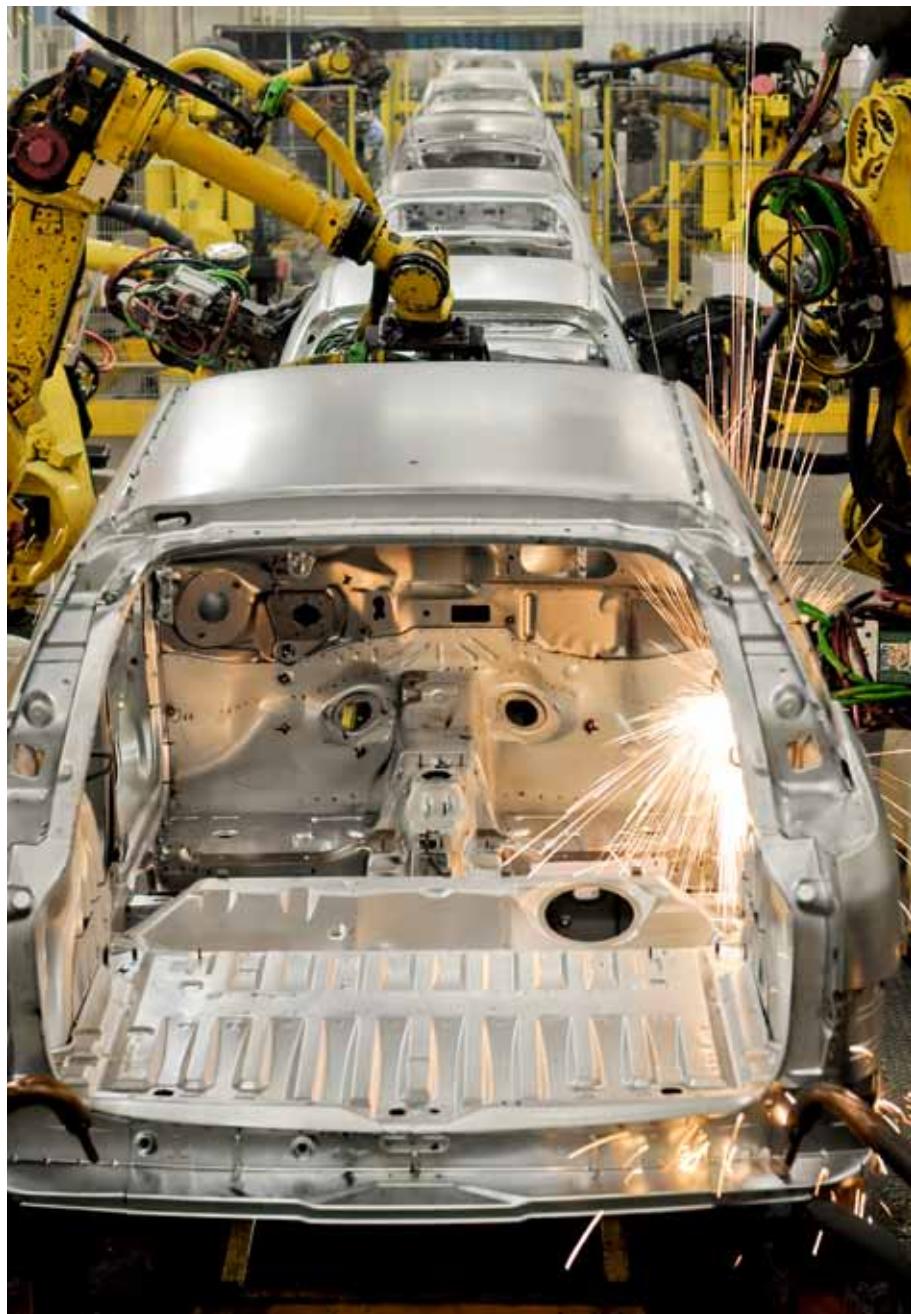
**Now is the time
to demonstrate
environmental
responsibility.**

Demonstrate this example to others. After all, we are in a very serious situation. The commitments made by states to fight poverty and underdevelopment (the

UN Millennium Goals), as well as their environmental commitments, are being fulfilled very slowly, and sometimes exist only on paper.

ISO Focus+: *Can you describe the use made by car makers of environmentally-friendly processes and products – how can political leaders help?*

Mikhail Gorbachev: The adoption of alternative and renewable energy sources is progressing very slowly. The reason for this is that, until now, we have not found the mechanisms to stimulate transferring to these sources of energy. However, the main cause is a lack of political will. Here, political leaders must show some accountability.



You probably know that after stepping down from my post as President, I became involved in a number of projects and initiatives and I have been able to achieve a great deal.

One example is the Gorbachev Foundation, which has become a respected centre for independent political and socio-economic research and is home to archives and other materials on the history of *perestroika* (the restructuring of the Soviet political and economic system).

Another is the New Policy Forum as well as the World Summit of Nobel Peace Laureates, which has pioneered major initiatives concerning security and development problems.

Yet another is the Man Who Changed the World Prize, where we celebrate people giving unique input into creating a new world with greater justice and stability.

I am also involved in philanthropic projects, particularly in the fight against childhood leukaemia, which have greatly reduced mortality from this disease in Russia.

**Political leaders
must show some
accountability.**

Finally, the project I consider most important is Green Cross International. I am the president and founder of this environmental organization. There are many different reasons for this, which developed over the course of my entire life.

ISO Focus+: *What is the strategic value of International Standards to the automotive sector?*

Mikhail Gorbachev: Clearly, with more than a billion estimated road vehicles in use worldwide, if the automotive sector uses state-of-the-art standards for aspects such as safety, performance, impact on the environment, and requirements for supply chain partners, this can have an enormous impact on all three dimensions of sustainable development – social, environmental and economic. The importance of this challenge is reflected by ISO's response.

Out of a current total of more than 19 000 ISO International Standards for almost all sectors of business and technology, more than 1 000 have been developed for road vehicles and related technologies, such as intelligent transport systems. ■



Richard Parry-Jones

Internationally renowned car guru

Prof. Richard Parry-Jones, CBE¹⁾, was Vice President, Global Product Development, and Chief Technical Officer at Ford Motor Company until his retirement in 2007. In a 38-year career with Ford, Prof. Parry-Jones worked in many areas of the company's organization and, as a senior leader, oversaw product development activities for all Ford vehicles worldwide, as well as the design, research and vehicle technology functions. As Chief Technical Officer, he reported to the company's Board of Directors on technical matters, heading a technical staff of 30 000 engineers, scientists, designers and business professionals in North America, Europe,

Latin America and the Asia-Pacific region, and working on Ford, Lincoln, Jaguar, Volvo, Land Rover, and Aston Martin brands. Included in his wide range of duties was responsibility for product safety and environmental initiatives. Prof. Parry-Jones is the current Chair of the United Kingdom Government Automotive Council Industry, and Pro Chancellor and Visiting Professor in Automotive Engineering at Loughborough University and runs his own consulting company. www.rpj-consulting.com

1) Commander of the Order of the British Empire.



The ISO President's Forum took place on in December 2011, in Geneva.

ISO Focus+: You have been quoted as suggesting that “building a ‘supercar’ is much easier than creating excellence for the millions”. Could you please elaborate on this?

Prof. Richard Parry-Jones: There are two main reasons why I hold that view. One is that when you are trying to build a car for millions of different customers, they have a lot of competing needs. It is very difficult to find trade-offs to satisfy everybody.

For example, some people may want a car with a low-slung roof line, but they do not want to lose interior headroom. They would like a compact vehicle, but they want to be able to fit their children in with all their paraphernalia (pushchairs, etc.). They would like high performance, but cannot really afford the fuel to go with that performance.

A “supercar” exaggerates one or two attributes.

A “supercar” exaggerates one or two attributes – but compromises many others. The cars people are going to find use for every day have to do a much greater range of things than a “supercar” which only has to do a few things exceptionally well.

And a second major reason why it is more difficult, in my view, to produce a car for the millions, is that you have to manufacture something that can be produced at a really affordable price. Therefore, you need to find engineering solutions that do not use exotic

materials or lots of highly paid craftsmen to offer a product to the customer.

You have to be able to use low-cost materials, produced with a minimum of waste and that are compatible with high-speed automated manufacturing processes. You have to think about a whole raft of factors. I am not saying “supercar” manufacturers do not need to worry about cost or that their jobs are easy, but I can assure you, having done both, that the cost challenges for a car for the millions are much harder to resolve.

ISO Focus+: In your view, what is the relationship between International Standards and innovation for the automotive industry? Is there a right moment for the development of standards for new technologies? You mentioned “finding that sweet spot”.

Prof. Richard Parry-Jones : The first point I would make is I do not think there is a generic answer to this question in the sense that it very much depends upon with which particular technology the innovation is concerned. Some innovations, some technologies, will require different approaches to standards than others.

As we discussed at the ISO President's Forum, when technologies are in the early phases of competing with each other to create an innovative performance jump, the introduction of standards has to be handled very carefully. If standards are too prescriptive and too premature, they can actually inhibit innovation rather than promote it, because it will not yet be clear which technologies are going to be the dominant winners.

If, of course, we leave the creation of standards too late, then several versions



of a given technology will gain a sufficient foothold in the marketplace with different standard operating interfaces. This will then create significant economies of scale and it will be very hard to persuade the people who invested a lot of money in their technologies, to migrate towards a common standard because many will lose out, re-tooling and re-doing their stuff.

Standards can accelerate the adoption and lower the cost of adoption.

That is how we arrive at the idea of a “sweet spot” somewhere between the chaos of multiple solutions being offered early on – which is a necessary part of innovation – and the arrival at a definitive choice when a group of technologies emerge as likely winners. Standards can accelerate the adoption and lower the cost of adoption. But standards must dictate only outcomes and interfaces, not become overly prescriptive so that innovation can continue within the broad framework that the standards define.

ISO Focus+: What are the unique challenges for standardization of the automotive industry? How can ISO and International Standards help add value to innovative efforts and meet the industry's needs?

Prof. Richard Parry-Jones: I think of the unique challenges – the one worth picking out is the absolutely enormous scale of the automotive industry : it completely dwarfs the size of most other industries in terms of turnover. A challenge associated with that scale is that it is possible to achieve scale economies on a regional basis. The incremental advantages of global scale economies over regional ones are relatively small.

But the industry is becoming more and more global as consumers' demands for the core model ranges (VW Golf-sized vehicles and VW Passat-sized vehicles) are converging rapidly. As all countries face similar challenges, there is a new economic incentive to create standards that are driven by two factors. First, is what we call the fragmentation of the industry. What I mean by that is in the past a manufacturer would produce a four-door Passat-type car and might reasonably expect to sell 400 000 units in Europe, 400 000 units in the USA



and maybe another 400 000 units elsewhere in the world. With a total of 1.2 million Passats – pretty straightforward, economically attractive.

Nowadays, the customer choice has become very broad, and annual sales volumes per individual model derivative have been reduced – this is what we call fragmentation. The industry attempts to counter the negative cost implications of fragmentation by being the first mover. The first mover gets a revenue premium, but once that new segment has been exploited by multiple competitors, that premium disappears and costs then need to be reduced for the successor derivative.

This is done by sourcing and designing it for global sales. For example, although sold in Europe, a four-door Focus will no longer be manufactured in Europe, but in its primary market, China, where there is a huge demand for four-door cars over five-door cars. This cross-globalization of derivatives brings a new economic imperative to create standards that are global as opposed to regional.

The second driver of International Standards is the carbon dioxide reduction challenge that the industry faces, which is leading towards electrification. That trend generates a need to interface with the electrical supply infrastructure.

This new challenge is akin to creating a road system in a medieval country. There is already a lot of architecture and infrastructure

installed ; we need to find ways to adapt what already exists.

With the electrical supply industry already having a number of regional standards which are notoriously lacking in compatibility for a whole variety of technical criteria, we have a huge challenge to create products that can interface with this pre-existing, non-uniform electrical supply infrastructure. Dealing with this situation will require more stakeholder involvement, and a truly international approach.

The problem is that as far as the automotive industry is concerned, each region has its own standards, Japanese, American and European, rather than relying on ISO standards. And as long as these three regions do not accept the superordinate role of any one International Standard, the challenge will go on.

ISO Focus+: The automotive press has called you a “driving dynamics guru” and “one of the world’s leading automotive engineers”. As such, where do you see the industry heading in the next 10 to 20 years ? Where do International Standards fit into your vision of the future ?

Prof. Richard Parry-Jones: Clearly, we are going to be driving more and more cars that are smaller and aimed more at urban use.

Today’s cars are really completely ubiquitous. A customer can buy a Fiat 500 or a Range Rover and drive either

of them from Hamburg to Bologna; they will both do the job very well. Granted, the Range Rover might get you there a bit more comfortably and it might defeat the Alps with greater aplomb. Both cars will also get you down to the local supermarket, although the Range Rover might be a little more difficult to park.

Electrification will not take place in a, let us say, “monocultural fashion”.

So what we have got in today's cars is an incredible amount of “mission ubiquity”. This means they are able to perform many, many missions, spontaneously, on demand. But reducing carbon emissions from 160 g to 40 g/km involves more efficient vehicles that give up capability which few customers ever use. In other words, we are going to have to design them to be less ubiquitous and more mission-specific – for example, more urban. Drivers' needs for the longer journey vehicle may be met in other ways.

The next big trend I predict is much, much smaller engines. Today we are all used to driving, let us say, a two-litre engine with four cylinders in either a Ford Focus or VW Passat-type vehicle. Tomorrow



we shall probably be driving a 1.2-litre, three-cylinder engine, pressure-charged, delivering better performance with between 20 and 25 % lower CO₂. Petrol engines will become more efficient faster than diesel engines ending the almost steady increase in diesel penetration.

The third major trend is, of course, electrification. I believe that electrification will not take place in a, let us say, “monocultural fashion”. There will be multiple solutions that will be viable for many, many years. Batteries will continue to have significant shortfalls (e.g. in their capacity to store energy and therefore their range, and also in their extremely high cost). I think, battery electric vehicles with no liquid fuel or gaseous fuel, will be restricted for many years to the urban role, but their numbers will increase.

Then we shall see, I would say, the vehicle which is most like the vehicle we are used to today: the ubiquitous one. It will probably be a plug-in series hybrid, so it will take much of its energy from the electrical grid and use that energy for short journeys, commuting and urban work, but it will have an on-board small gaseous or liquid fuel engine to be used as a range extender. It will kick in spontaneously when the journey demanded by the customer requires a greater range than the battery can provide.

The third type of vehicle will be what we call the highway trunker (a trunk-road vehicle) which is built for highway driving, and is really designed for efficient long distance business use. Potential customers will include drivers of freight vehicles as well as business cars and these will have internal combustion engines, a small amount of hybridization – but not much – and, in the future, they will be powered





by biofuels. This scenario will reduce the emissions of a fleet down to below 40 g/km which is where the industry needs to get to by around 2030-2035.

Finally, all cars will continue to get more comfortable, and safer and we will see the fourth major trend: vehicles will start to communicate with each other intelligently.

The industry is changing and becoming more and more global.

At the moment, as you know, we now have SAT NAV systems where cars receive information from an infrastructure in space to help drivers make decisions on the best route. We also have radio data systems which provide traffic information via radio waves, sometimes automatically modifying the route in the SAT NAV.

Today, each car interacts with the information gathered around the road system, collated in the information infrastructure and then shared with multiple vehicles. But in the near future, cars will start to communicate with each other instead, exchanging information about where they are, at what speed they are being driven and in what direction they are going.

In the case of cars within one or two kilometres of each other, that will give

ample warning that there may be a hazard on the road ahead. If you think about driving on the freeway and a car is stopped in the outside lane, maybe one kilometre ahead, that car will be sending a signal to all the cars around it, letting them know that there is a danger ahead and to start slowing down.

Today, each car interacts with the information gathered around the road system.

Within a shorter range, for example, up to 100 metres, we will be looking at accident avoidance. If a car's trajectory looks as though it may pose a threat to another car, the driver will be provided with information in the first instance and, where necessary, a car will take its own autonomous action to prevent a collision. This technology can also be used to reduce congestion.

To achieve all these benefits to society and customers in terms of emissions, congestion and safety, we will require International Standards for communications, so that every car can talk to another reliably and securely.

ISO Focus+: Finally, given all the regional manufacturers' associations all over the world, which, at times, may cause fragmentation and friction, what are your thoughts on the establishment of a global manufacturers' association? What are the benefits of this approach? Is there a role for ISO?

Prof. Richard Parry-Jones: I think that for the reasons I described earlier, it is clear that the industry is changing and becoming more and more global. Yet, just as the standards organizations have grown up around regional spheres of influence, so have manufacturing associations, almost in parallel.

Just as I have argued that there needs to be a forum or an authority for taking action on International Standards, I think there are also arguments for why there should be a forum for international automotive manufacturers to meet and find areas of common purpose and use that common purpose to bring their influence to bear on a) each other, b) governments in terms of giving them better information about future policy and c) on matters such as pushing for International Standards as opposed to regional standards, where those are appropriate. ■





Photo : Kia Motors Corporation

From the boardroom

The bottom line on International Standards



Photo : Audi AG



Photo : Kia Motors Corporation

Hyoung-Keun Lee
Vice Chairman & CEO
Kia Motors Corporation

If the global automotive industry combined efforts to invigorate current ISO activities, car manufacturers, motorists and our planet would all benefit. Greater cooperation could also lead to an even broader range of car-related technology standards.

Previously considered simply as a mode of transport, cars are now seen by many consumers as an essential part of everyday life. Cars have evolved to reflect the complexity of modern lifestyles, meeting our needs and expectations in terms of comfort, convenience, eco-friendliness, safety and entertainment, while on the move.

Better informed and smarter than ever, today's car buyers are demanding more features, better quality, improved economy and even better value. The world's automotive



Photo : Kia Motors Corporation



Photo : Kia Motors Corporation

manufacturers face a difficult task: meeting these growing consumer demands; and generating sales and profits in competitive markets and tough economic conditions.

Technology and cooperation

For car manufacturers, these trends have created both opportunities and challenges. I believe the best strategy for Kia Motors is to innovate and develop advanced technologies, while building partnerships with other vehicle manufacturers.

In the spirit of cooperation, I propose much greater international automotive standardization. This will require the combined efforts of all industry players and an industry-wide revolution if car-related certifications and new technology standards are to be uniformly adopted. Such a move would bring great benefits, especially as Japan, Europe, the USA and other markets currently operate their own industry measures in the areas of safety and the environment.

At Kia, we feel that all industry players should join in actively supporting the World Forum for Harmonization of Vehicle Regulations (WP.29), organized by the United Nations Economic Commission for Europe. This group is reviewing the technical and legal aspects of car certification relating to fuel emissions, energy use, crash safety, lighting systems, drivetrains, brakes, noise, general safety and global technical regulations.

An industry need

The issue of International Standards' diversity also applies to electric vehicles (EV). In June 2011, South Korea introduced its own national standardization relating to electric car recharging. Meanwhile, Japan, the USA and Europe are following their own "local" standards.

However, if we can establish viable International Standards, future EV users can have easy access to recharging facilities and eliminate "range anxiety", the doubt about reaching a destination before running out of power.

Two other important areas demand the adoption of global International Standards: intelligent technology and recycling.

For customers' convenience and safety, car manufacturers should consider introducing common International Standards for "intelligent car technology", encompassing navigation and "infotainment" systems, to facilitate integration and cost-effective deployment. Car makers also need to direct efforts and funds towards creating International Standards for car resource recycling to help reduce greenhouse gas emissions.



Photo : Kia Motors Corporation

Why we must act

Kia wants to introduce new models that are appealing to customers worldwide, while helping to reduce the impact of car manufacturing and car ownership on the environment. As key parts of our drive towards ever greater environmental and social responsibility, we are increasing our industry cooperation and lobbying for a broad range of global standards. ■



Photo : Audi AG

Martin Conrads

*Head of Information Services
and Standards – Audi AG*

Since cars are available in every country worldwide, International Standards are both beneficial and necessary. In the automotive sector, efforts in standardization are focused on ISO activities.

For Audi, International Standards open the worldwide supplier market. Standardized components give our customers remarkable added value, for example with the ISOFIX child seat interface.

Safety is an important issue in the automotive industry and at Audi we constantly strive to make our cars safer. In addition to the regulatory requirements, many International Standards help to improve safety for car occupants and other road users. Globally accepted safety standards reduce the need for further regulation.

Photo : Audi AG



Photo : Audi AG

To guarantee their global acceptance, International Standards must follow and satisfy a worldwide consensus-finding process.

New e-mobility technologies require new standards in a particularly short time. This urgency also applies in communication protocols, energy storage, high-voltage networks, thermal management and some other areas of the automotive industry.

*International Standards
open the worldwide
supplier market.*

The technology convergence of mechanical and electric/electronic systems makes it increasingly difficult to define one responsible committee for the standardization of a new subject. ISO, the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU) need to increase their cooperation to offer industry-concerted global solutions.

We believe the Transatlantic Economic Council initiative has already improved



Photo : Audi AG

attitudes. For example, standards bodies in Europe and the USA are now discussing joint approaches and will hold a transatlantic e-mobility meeting in early 2012.

A critical mass of car manufacturers has also agreed on a common charging approach for electric vehicles in Europe and the USA. This will reduce build complexity for manufacturers, accelerate the installation of common systems internationally and, most importantly, improve the ownership experience for electric vehicle customers.

While the production of ISO standards certainly draws on some industry resources, the benefits far outweigh the costs. ■





Driving into the future !

The 82nd Geneva International Motor Show

The Geneva International Motor Show has always been a birthplace of innovative ideas and strong emotions regarding the future of the automobile. André Hefti, Managing Director of the show, sits down and talks cars, ecology, expectations and standards with *ISO Focus+*.

ISO Focus+: *Entering its 82nd year, the Geneva International Motor Show is among the most prestigious in the world. How has the show's profile evolved over the years? What are the reasons for its unparalleled success?*

André Hefti: During the last decade, the Geneva Motor Show clearly evolved from a sales platform to an image showcase. Each year exhibitors use this unique opportunity to unveil an astonishing number of premieres. On one hand, they are presenting new models

that are going to be launched or that are already on the road. On the other hand, they give interesting insight into future projects and technologies. The manufacturers are obviously keen to position themselves in a highly competitive market. As a result, the visitor gets an overview of the entire automotive universe.

It is important to realize that the Geneva Motor Show has been able to retain its "human scale" with its seven exhibition halls all "under one roof". Another reason

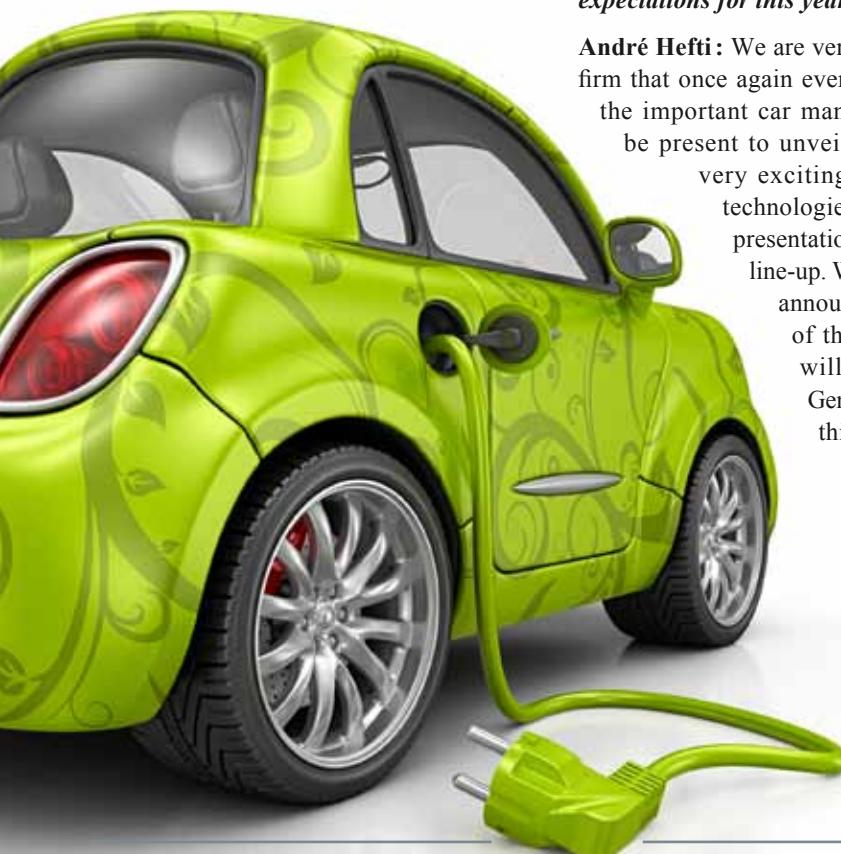
for sustaining Geneva's privileged position among motor shows is that, besides Geneva's international reputation, Switzerland is one of the few countries without a national motor industry; therefore, virtually "free competition" exists in the private motor car sector. It is the Geneva Motor Show that has a more international character than the four other manufacturing countries' largest shows, such as Paris, Frankfurt, Tokyo and Detroit; since their priority is to display, to their best possible advantage, national products.

It is the only major show in Europe (along with Paris and Frankfurt) that takes place every year in the spring, almost exactly when the sales season starts.



André Hefti, Managing Director
of the Geneva International Motor Show.

ISO Focus+: The Geneva International Motor Show became the first international motor show to focus on ecological transportation technologies of the future. What are some of the benefits of this initiative? Are there other areas in which the show would like to develop or improve on?



André Hefti: The show's "Green Vision" with its Green Pavilion and Green Test drives attracts a new kind of visitor who would normally – for ecological reasons – not be interested in cars. It provides an overview of technological solutions for the future and showcases the efforts that are made by the motoring industry in order to preserve our environment. The test drives help to break through the prejudices about environmentally friendly cars as boring and/or ugly. We have noticed that this "Green Vision" is a very strong and growing point of interest for visitors of all generations.

For its first edition, the Green Pavilion exclusively featured highly qualified and specialized institutions, as well as some select start-up groups. These are the few who were able to take advantage of this unique opportunity to present the latest fruit of their research and hard labour to the general public within the framework of a global exhibition. They were also given the opportunity to develop their relationships with the automobile manufacturers exhibiting at the Motor Show. Meanwhile, these constructors recognized this opportunity as being the best one to present to the public their latest prototypes, which are ready for mass production.

ISO Focus+: How does the 82nd show differ from previous years? What are your expectations for this year's show?

André Hefti: We are very happy to confirm that once again every single one of the important car manufacturers will be present to unveil some of their very exciting new cars and technologies in a beautiful presentation of their model line-up. We are pleased to announce that the Car of the Year election will be held at the Geneva Motor Show this year.



GENEVA 8-18 MARCH 2012 **INTERNATIONAL MOTOR SHOW AND ACCESSORIES**



The poster for the 82nd Geneva International Motor Show (March 8-18, 2012).

The organizing committee of this very prestigious trophy postponed their official announcement in order to make it with us in Geneva.

And of course, there will be – as always – a lot of side events to be discovered closer to the event.

ISO Focus+: The seventh edition of the Fully Networked Car Workshop will be held during the Geneva International Motor Show and the three standards bodies organizing the event – IEC, ISO and ITU – would like to make it the most successful ever. What are the key issues that standardizers must focus on? How can we leverage the industry's presence at the show to attract greater participation?

André Hefti: The Geneva Motor Show is a communication platform that brings together all important key actors in the motor industry world, as well as scientists, designers and of course every year approximately 700 000 visitors. We think that the Fully Networked Car Workshop benefits from an ideal framework. The participants are offered a very interesting workshop combined with the possibility of visiting the Show. They are also able to network in this fruitful environment. We are very happy to welcome this workshop which highlights an important aspect of today's mobility. ■

by Kevin W. Lu

For several years, telematics¹ systems based on cellular mobile communications between service centres and on-board units have provided vehicles with basic and value-added subscription services. Millions of road users benefit from these services, generating significant economies of scale. Over recent years, cooperative intelligent transport systems (ITS) have advanced beyond the scope of telematics services. And in recent trials, many safety, mobility and environmental applications, enabled by connectivity among vehicles, infrastructure, and wireless consumer devices, have gained momentum.

Economies of scope

Can cooperative ITS and existing telematics systems benefit from economies of scope through a multi-service delivery platform for all connected vehicles?

This ambitious vision requires that all stakeholders – including the automotive industry, major suppliers, public authorities, road operators, public telecom operators and technical experts in standardization and testing – specify:

- Common message sets
- Application programming interfaces
- Technology-neutral protocols among service centres, core systems, field or roadside equipment, and vehicle on-board equipment.

On-board equipment could then be built-in or brought-in, so that all types of vehicles could benefit, including passenger, commercial, emergency, maintenance and construction vehicles.

Other issues to consider include:

- What cooperative ITS applications have been specified?
- Are use cases defined and their benefits evaluated?

1) Integrated use of telecommunications and informatics, also known as information and communication technology.





- What is the best communication technology for the intended applications?
- Is the technology reliable and secure?
- Is user privacy preserved?
- Are International Standards available to ensure interoperability?

Existing telematics services

To date, several telematics service providers offer basic or value-added subscription services such as automatic crash response, stolen vehicle assistance, roadside assistance, remote door lock/unlock, remote start, remote horns and light, remote vehicle diagnostics and turn-by-turn navigation. These can be delivered via on-board equipment or mobile devices over existing cellular networks.

Cooperative ITS applications

The European Telecommunications Standards Institute (ETSI) has released a basic set of ITS applications in three categories:

- **Cooperative road safety** – includes emergency electronic brake lights, emergency vehicle warning, traffic hazard warnings, lane-change assistance, pre-crash sensing warning, intersection collision warning and cooperative forward-collision warning

- **Traffic efficiency** – includes traffic light optimal speed advisory, in-vehicle signage, electronic toll collection and cooperative adaptive cruise control
- **Other** – includes automatic access control/parking access, ecological/economical drive, vehicle relation management and fleet management.

*More human factor
R&D is crucial to
ensure cooperative ITS
applications.*

Vehicle-to-vehicle safety applications have been tested on low-latency dedicated short-range communications (DSRC). For example, pre-crash sensing warning and lane-change assistance applications require maximum latency of less than 50 or 100 milliseconds respectively. In contrast, applications with infrastructure involvement, requiring maximum latency of less than 200 or 500 milliseconds, have been demonstrated over cellular mobile networks.

Since DSRC-equipped on-board and roadside equipment may not be widely deployed in the near term, the existing cellular mobile networks could provide complementary capacity for cooperative ITS applications.

Geomessaging over cellular networks

Unlike the DSRC system that uses local broadcast within the transmission range, cellular networks require efficient geocast to deliver location-specific messages. The following key requirements for real-time cellular geomessaging have been proposed:

- Support of multiple geomessaging targets
- Up-to-date location information and granularity
- Variable geomessaging regions and sufficient accuracy
- Minimized data traffic for cellular networks
- Scalability of geomessaging
- Minimized end-to-end delay.

Although a grid-based localization method has been evaluated successfully in meeting these requirements, further analysis of optimal grid sizes is underway.

Capacity impact of message types

ETSI has specified a periodic cooperative awareness message (CAM) and event-triggered decentralized environmental notification message (DENM) for cooperative ITS applications.





A recent analysis of long-term evolution network capacity for these message types revealed significant overload due to “here I am” CAMs that were sent every 100 milliseconds. In contrast, sending event-triggered DENM is feasible over cellular networks.

Privacy-preserving security

Telematics service providers protect subscribers’ personally identifiable information including insurer data, toll and parking payments, and remote vehicle diagnostics. In contrast, cooperative ITS systems gather anonymous probe data from vehicles on traffic conditions, weather and road surface conditions.

Privacy-preserving security measures are applied to transmitted information to ensure that probe data are both anonymous and trusted. In the event of detected misbehaviours such as sending malicious or erroneous messages, the cooperative ITS

systems will revoke the certificates and distribute certificate revocation lists.

Enabling interoperability

In April 2010, the joint European Committee for Standardization (CEN) and ETSI response to Mandate M/453 included a list of minimum cooperative ITS standards required for interoperability. It also included an overview of existing and developing standards by CEN, ETSI, the Institute of Electrical and Electronics Engineers (IEEE), ISO and SAE in these categories:

- Facilities (layer architecture, CAM, DENM, data dictionary, etc.)
- Network and transport (geonetworking, service announcement, multichannel support, congestion control, etc.)
- ITS-specific access technologies (DSRC, 2G, 3G, etc.)
- Management (ITS station, congestion, identities, application management, etc.)

- Security (architecture, security, privacy, etc.)
- ITS architecture (ITS communications architecture).

In April 2011, the first joint CEN/ETSI progress report to the European Commission provided the status of standardization activities. It also described the involvement of other standards organizations and international cooperation for global harmonization of existing and future cooperative ITS standards.

Distracted drivers

As we look ahead into the vehicle of the future, it is clear that additional cooperative ITS applications will be developed for vehicles, pedestrians and cyclists. More human factor research and development is crucial to ensure cooperative ITS applications will not distract drivers. Future standards should reflect this need. ■

About the author



Dr. Kevin W. Lu is Director of Standards Development (2012–2013) for the IEEE Communications Society. He is also a member of the US Technical

Advisory Group to ISO/TC 204. Between 2007 and 2010, he was Chair of Telecommunications Industry Association TR-48 on vehicular telematics. He contributed to the Alliance for Telecommunications Industry Solutions Machine-to-Machine Focus Group and the 2011–2014 Strategic Plan for the US Department of Transportation ITS Standards Programme. In addition he has participated in the SAE DSRC technical committee.



Running on state-of-the-art ISO standards

Nearly 1 000 ISO standards have been developed for the automotive industry covering all aspects: safety, ergonomics, performance, test methods, the environment, and the roll-out of innovative technologies.

Below are just a few highlights.

Ergonomic aspects

ISOFIX¹⁾

Diagnostic communication over Internet Protocol (DOIP)

Diagnostic communication over Controller Area Network (DoCAN)

Brake lining friction materials

Communications access for land mobiles (CALM)



1) ISOFIX attachment system for connecting the child car seat to the vehicle.

Driver's eye
location

Symbols
for controls, indicators
and tell-tales

Adaptive
cruise control
systems

Electrically
propelled road
vehicles

Pedestrian
protection – impact
test methods

ITS service and
multimedia provision
in vehicles

Electronic registration
identification
(ERI)

Functional
safety

On the road to safety



Photo : Transport NSW

The NSW Centre for Road Safety's Research Vehicle is used to trial advanced road safety technologies in Sydney Australia.

Intelligent transport systems and accident reduction

by John Wall

Road accident-related injuries are a major, but neglected, public health problem. Globally, an estimated 1.2 million people a year die on the world's roads, and up to 50 million are injured. To reduce this toll, new initiatives, new technology and concerted, long-term effort are required. Intelligent transport systems (ITS) can make an important contribution.

By 2020, the total number of road traffic deaths and injuries worldwide is forecast to rise by some 65 %. In low-and middle-income countries, deaths are expected to increase by up to 80 % ! Most of these deaths are among vulnerable road users – pedestrians, pedal cyclists and motorcyclists. In high-income countries, car occupants account for most deaths, but vulnerable road users still face high risks.

Decade of Action

On 11 May 2011, the world's first Decade of Action for Road Safety was launched with great enthusiasm and optimism. Mandated by the United Nations General Assembly, the decade has been heralded as an historic opportunity for countries to stop and reverse an existing trend that could lead to around 1.9 million road deaths a year by 2020.



The road safety "tag", symbol of the Decade of Action.



Photo: Transport NSW

In over 100 countries, governments, international agencies, civil society organizations and private companies celebrated the decade's launch through hundreds of events. Presidents and prime ministers were involved, as were ministers of transport and health, company CEOs, road traffic victims, their families and many others, united behind the decade's goal to save five million lives.

Globally, an estimated 1.2 million people a year die in road accidents.

In Australia, our famous Sydney Harbour Bridge and the Brisbane City Hall were illuminated with the road safety "tag", the symbol of the Decade of Action.

Silver bullets

According to Australia's National Road Strategy 2011-2020 released in May 2011, the country has achieved substantial reductions in road accident fatalities and injuries over the past 30 years. Despite a 50% growth in population and a doubling of the number of registered motor vehicles between 1980 and 2010, the country's annual road fatality rate declined from 22.3 to 6.1 deaths per 100 000 people.

The downward trend in Australian road deaths has been characterized by short periods of rapid decrease followed by longer periods of consolidation and incremental improvement. Specific interventions such as the mandating of seatbelts in the 1970s and the introduction of random breath testing for alcohol in the early 1980s greatly reduced the road toll. These interventions have often been described as "silver bullets" of road safety.

In recent years, however, the rate of reduction in road trauma has slowed to an average annual drop of around 3.3%. Some commentators suggest that previous "silver bullets" have been exhausted and that a rapid fall in road accidents is unlikely to return. Others suggest that ITS may well be a "silver bullet" of the next decade.

So, between now and the end of the Decade of Action in 2020, how can ITS reduce accidents on our roads, and what form will this technology take?

Uncovering benefits

Australasian road safety practitioners have enthusiastically adopted a "safe systems" approach. Originally implemented in Sweden, this is written into national and

jurisdictional strategies across Australasia. Safe system principles require a holistic view of the road transport system and interactions among roads and roadsides, travel speeds, vehicles and road users.

Fundamentally, the safe systems approach recognizes that people will always make mistakes which may result in a road accident, but that the system should be forgiving to the extent that any accident does not result in death or serious injury. Australia's safe systems approach is built around counter-measures that lead to safer speeds, safer roads, safer vehicles and safer people.

In determining the role of ITS in the safety policy tool-kit, one issue is the lack of demonstrated benefits from new technologies. In March 2010, Austroads published the first major report commissioned by Australian and New Zealand government road authorities that endeavoured to quantify the accident reduction benefits of both vehicle- and infrastructure-based ITS technologies.

It was found that while many in-vehicle ITS devices were estimated to greatly reduce accidents, their costs greatly outweighed their benefits. The report concluded that at present only seatbelt reminder systems produced a positive benefit-to-cost ratio for in-vehicle devices under both optimistic and pessimistic assumptions on effectiveness.

According to the report, advisory intelligent speed adaptation (ISA) and lane-departure warning systems delivered positive benefits



Inside the Transport NSW Research vehicle equipped with an alcohol interlock, driver fatigue detection system, intelligent speed adaptation and night vision.



The Road Safety Technology Research Team.

operational tests are researchers' preferred method, they are expensive to conduct.

In October 2010, the Minister for Roads in New South Wales (NSW) announced the result of the NSW ISA trial. This was Australia's largest road safety ITS trial at the time, with more than 100 drivers travelling over 1.9 million kilometres during the trial period.

*ITS will play a major role
in the development
of a safer system
for road users.*

under optimistic effectiveness assumptions, with brake-assist technology falling just short of returning a positive benefit.

Roadside systems showed much more promise than in-vehicle systems. Speed limit enforcement cameras were described as having the greatest accident reduction benefit (35% fewer accidents) of available roadside ITS technologies. This was followed by speed-feedback signs and trailers, which were estimated to reduce accidents by 31%.

In June 2010, the University of Adelaide's Centre for Automotive Safety Research estimated the potential benefits of emerging ITS technologies for passenger vehicles, trucks and motorcycles. The report stated that the greatest benefit will come from seatbelt interlocks, seatbelt reminders, forward collision detection and avoidance technologies, and heavy-vehicle fatigue management systems.

Both reports highlight the need for more information on the effectiveness of new ITS technologies. However, while large-scale field

Independent modelling of the results showed that advisory ISA could reduce fatal accidents by around 19% across Australia. Previous estimates based on smaller national trials estimated the benefit would reduce fatal accidents by a maximum of 8%.

Improving the system

Adopted in recent years by road safety practitioners and policy makers in Australia and New Zealand, the safe systems approach challenges us to stop blaming the victim for causing road accidents and instead examines how we can improve the whole system for every road user, including pedestrians and cyclists.

Over the next decade, I am convinced that ITS will play a major role in the development



Photo: Transport NSW

John Wall with his section's first road safety technology research vehicle.

of a safer system for all road users. At least one or two road safety "silver bullets" could come from some currently available, but not widely deployed, ITS systems.

These include ISA, pedestrian detection coupled with automatic braking, interlock systems for alcohol, other drugs, driver fatigue and non-use of seatbelts, cooperative collision-avoidance systems, driver fatigue detection and warning systems, and automatic accident notification or e-call systems.

Saving lives with standards

In April 2012, ISO technical committee ISO/TC 204, *Intelligent transport systems*, will meet in Melbourne for the "Beyond 2012" Forum, the first such meeting in Australia.

I would like to commend the working groups of ISO/TC 204 for developing the standards that will provide the basis for these systems to be deployed safely and effectively across the globe. Your work will save many lives. ■

About the author



John Wall
is Principal Analyst, Road Safety Technology, with the Centre for Road Safety in Transport for New South Wales, Sydney, Australia. John

has worked as a government road safety professional for over 18 years. He is a national leader in the development of research and evaluation programmes that focus on new road safety technologies. In October 2010, he delivered the final report on the NSW ISA trial, Australia's largest ever connected vehicle road safety trial. He is currently serving as a member of the Austroads steering committee on the Australian Cooperative ITS project.



An Intelligent Speed Adaptation or ISA device indicates the driver is entering a 40 km/h school speed zone.

Driver assistance systems

Accelerating harmonization at the global level



by Yousuke Akatsu

Forming a central part of intelligent transport systems (ITS), “driver assistance systems control” means control technology for vehicles directly linked to a driver’s driving. Systems already in the market include adaptive cruise control and lane departure warning.

For 20 years an active and productive part of ISO technical committee ISO/TC 204, *Intelligent transport systems*, working group WG 14, *Vehicle/roadway warning and control systems*, has also successfully harmonized its new cooperative intelligent transport systems (ITS) standards with related standards developed by another organization.

This area of standardization aims to reduce the driver’s workload, improve the driving experience and raise awareness of hazards, as well as to use advanced technology to avoid accidents.

Vehicle/roadway warning and control systems

ISO/TC 204/WG 14 is developing standards related to driver assistance systems. It operates under the name of the working group for vehicle/roadway warning and control systems.

ISO/TC 204/WG 14 has quite a broad scope. “Warnings and controls for autonomous/infrastructure systems” include vehicle control, external information sensing, communications and interfaces with users.

With its many participating countries, WG 14 is widely recognized as one of the most active groups in ISO/TC 204. During the past 20 years, WG 14 has published eight “autonomous systems” standards (focused on in-vehicle sensors detecting external information) and is now developing six standards including two as cooperative ITS.

ISO/TC 204 working groups are facing new challenges, particularly standardization issues related to cooperative ITS.

Figure 1 (next page) shows examples of autonomous systems published as International Standards.

Action plan

The European ITS Committee’s “ITS action plan” aims to develop and deploy cooperative systems in the EU. In 2009, the committee issued Mandate/453 to the European Committee for Standardization (CEN) and to the European Telecommunication Standards Institute (ETSI) to encourage cooperative ITS.

Mandate/453 requires standardization development within a short timeframe. This includes producing European standards, technical specifications and guidelines in the areas of communication, information, applications and security.

In response to the “ITS action plan” and Mandate/453, ISO/TC 204/WG 18 was established in 2009 to accelerate the standardization of cooperative ITS.

Cooperative ITS aims to provide applications or services using vehicle-to-vehicle (V2V) and/or vehicle-to-infrastructure (V2I) communication.

Looking at the activities of standards development organizations (SDOs), some harmonization is clearly needed to achieve globally accepted standards.



WG 14 consulted with WG 18 to define the work items across the two groups and to decide and assign responsibilities. WG 18's role is to develop standards and, most importantly, to harmonize and coordinate work carried out by the working groups of ISO/TC 204. Thanks to WG 18's efforts, we have clearly defined and assigned work on cooperative ITS, taking Mandate/453 into consideration.

Cooperative systems

Longitudinal collision risk warning using V2V communication (LCRW) is a cooperative system using V2V communication to exchange the information from each car. Forward vehicle collision warning systems (FVCWS) is an autonomous system that uses in-vehicle sensors to detect distance and velocity relative to the car ahead.

Standards development organizations must work hard to communicate, cooperate and harmonize standardization.

Both systems may look different as they use different countermeasures to receive vehicle information. But, to avoid driver confusion, the functional and the operational requirements of the standards – warning timing and modality – must be consistent with each other.

ETSI has also been developing standards related to cooperative ITS systems, again in accordance with Mandate/453. The standards are :

- Longitudinal collision risk warning using V2V communication (LCRW)
- Intersection collision risk warning using V2V and V2I communication (ICRW).

On the other hand, ISO has two International Standards :

- Forward vehicle collision warning systems (FVCWS)

- Cooperative intersection collision warning systems (CIWS).

Successful harmonization

ISO/TC 204/WG 14 has therefore negotiated with ETSI WG 1 for the harmonization of each draft to achieve a globally accepted standard on both FVCWS and LCRW.

Following positive discussions, WG 14 and ETSI WG 1 have formed a category A partnership making it possible to exchange drafts and survey contents. Both parties have also linked up on CIWS and ICRW.

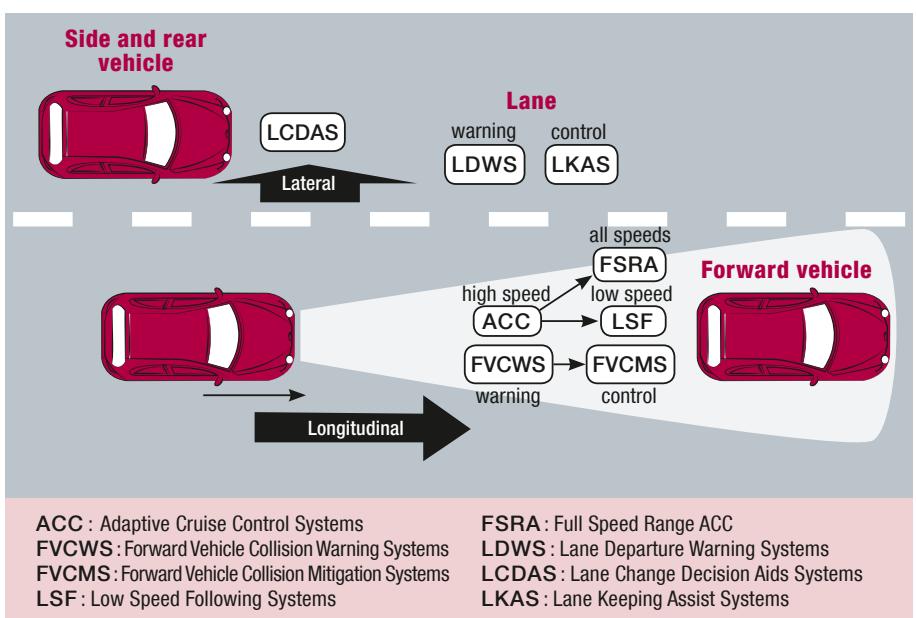


Figure 1 : Examples of WG 14 Items – Warning / Control systems for longitudinal and lateral direction.

Figure 2 shows the liaison status of ISO/TC 204/WG 14 and ETSI WG 1, and the trilateral harmonization status between CEN, ISO and ETSI.

While a number of SDOs are rushing to establish drafts for future cooperative systems, some SDOs have little experience in negotiating in standardization. As a result, SDOs may take a long time to agree on collaboration or, of course, may never agree at all.

However, ISO/TC 204/WG 14 was fortunate to have Gérard Ségarra as a liaison partner. He is a Chairman of ETSI TC WG 1 and takes a strong lead to achieve a globally accepted standard. Also, the leaders of ETSI TC ITS and ISO/TC 204/WG 18, Dr. Soeren Hess and Dr. Hans-Joachim Schade, understood the importance of our harmonization and willingly helped us to accomplish it.

Effective collaboration with ETSI depends on mutual understanding, close cooperation and a determination to avoid duplication.

Communication and cooperation

When a new category of standard is proposed, there is often confusion about which SDO will establish which standard. Once a certain SDO begins to develop a new draft, it is hard to stop it or change it.

On the process of standardization, SDOs need to examine their own and others' activities so they can share or divide responsibilities. Early on in the process, they must work hard to communicate, cooperate and harmonize standardization. In this case, the proverb "time is money" is more important than another: "silence is golden". ■

About the author



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tems, since 2010. He joined Nissan Motor Company Vehicle Research Laboratory in 1980. His areas of expertise include suspension control and advanced driving assistance systems.

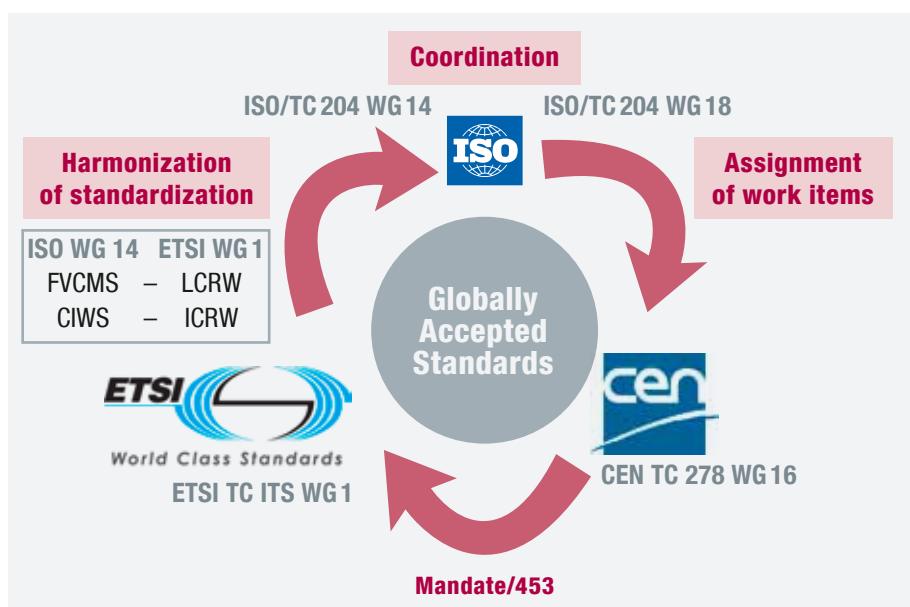
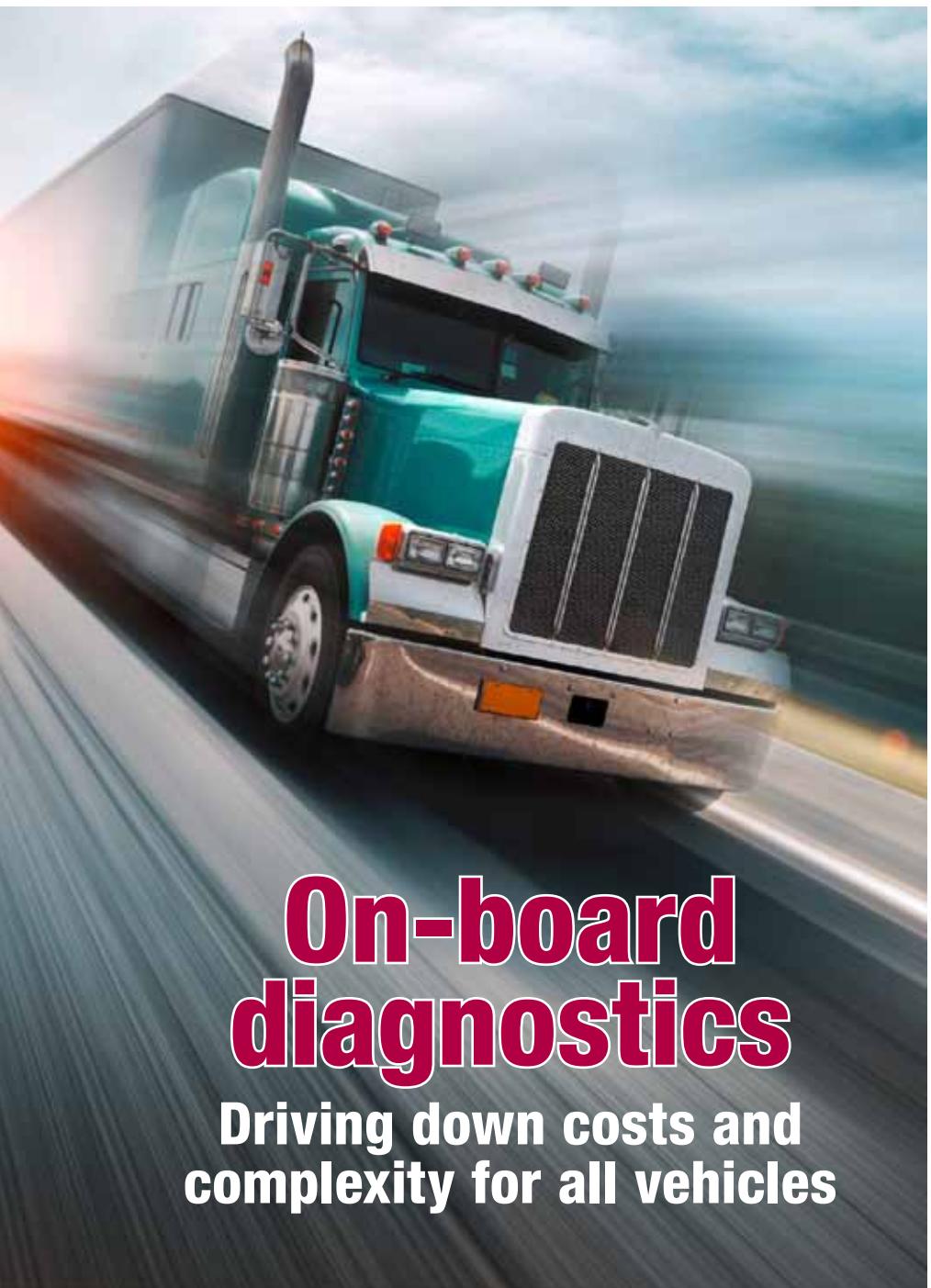


Figure 2 : Harmonization and coordination of co-operative ITS systems on standards.





On-board diagnostics

Driving down costs and complexity for all vehicles

by Joakim Pauli and Volker Rabe

Today's heavy vehicles are sophisticated. Their electrical architecture, for example, is often a distributed system of computers or controllers that communicate with each other. Functions can be either implemented in one controller or distributed by several controllers. An example of this complexity is that the emission controller, after-treatment controller and, possibly, the instrument cluster and a body controller need to work together. For safety systems, the brake controller, autonomous cruise control, instrument cluster, engine controller and a body controller must work together if the safety functionality is distributed over those controllers (See **Figure 1**).

Similarly, increasingly sophisticated emission systems are designed to minimize exhaust emissions to a very low level, usually by utilizing Exhaust Gas Recirculation systems, NOx reduction reagents and Particle Matter Filter.

The system's complexity makes it hard to trace faults following a malfunction since all systems are tuned to work together and a fault can occur for an electrical, mechanical, thermo or chemical reason.

Role of regulations

In many countries, regulations state that vehicles need to be inspected periodically. It can be difficult to carry out an exhaust emission test to check that the vehicle is fulfilling the emission levels at a periodic inspection if test equipment becomes contaminated after testing an older vehicle. The easiest way is to use the on-board computers and the information stored in them to judge if the vehicle is roadworthy. It is also possible to judge if a malfunction affects emissions, safety, both, or is not important at all.

Currently, there is one regulation in Europe, another in the USA and most other countries have adopted one or the other. The United Nations issued worldwide harmonized on-board diagnostic (WWH-OBD) to harmonize legal requirements for vehicles. WWH-OBD aims to make it simpler for vehicle manufacturers to make one product which then would be allowed in all countries that had adopted the regulation.

This work started as a global technical regulation (GTR), which was developed and negotiated by both regulators and industry. The goal is for regulators to implement the GTR rather than write their own.

The first GTR was written for emissions and emission diagnostics for on-road vehicles. New GTRs can be added in the future, for example for safety-related components.

The European Commission adopted the GTR but developed it further for the forthcoming Euro VI and the updates have been used to update the GTR.

For diagnostic communication and fault code handling, the main differences between current Euro V (for heavy vehicles), the California regulation for heavy vehicles and the new GTR are:

- Vehicle on-board diagnostics (VOBD), a centralized module which reports on vehicle road worthiness
- Fault code classes to indicate the impact on emission or severity

- New handling for the malfunction indicator in the instrument cluster
- Information to the driver of malfunction and readiness
- Use-cases
- New legislated diagnostic protocol – ISO 27145.

Central information store

VOBD communicates to the instrument cluster to keep the driver informed of any malfunctions which affect the exhaust emissions. A centralized module, VOBD, can be either a separate electronic control unit (ECU) or included in the functionality of another ECU – the decision is up to the vehicle manufacturer. The idea is to have in one place a facility able to report on the road worthiness for the complete vehicle.

In the future, it may be possible to have short-range wireless communication between vehicles and infrastructure such as road portals. This will enable road worthiness to



be checked as the vehicle passes the portal. The distances for communication may be short and, especially if the vehicle is moving at high speed, there will be little time to identify the vehicle and request data. The answer is for all data to be pre-collected and stored in the VOBD.

Fault code classes

Fault codes aim to differentiate emission malfunctions by severity or emission impact. The engine and exhaust after-treatment system are developed so as not to exceed the emission limit, which is decided by regulators. This is only possible if there are no faults in the engine or in the exhaust after-treatment system. Some malfunctions may cause the vehicle to exceed the emission limit and some may also cause the emission to exceed the on-board diagnostics (OBD) threshold limit.

If the malfunction does not exceed the emission limit, the fault is classified as class C. If the OBD threshold limit is exceeded, the fault is classified as either class A, if the on-board threshold limit (OTL) is exceeded, or as class B1, if the OTL is not exceeded.

The driver's instrument cluster will show if the malfunction indicator flashes briefly directly after starting the engine, or if it is always on. The driver needs to know of malfunctions causing excessive emissions in order to take it to a workshop and have it repaired.

Malfunction indicator

In the updated GTR, changes have been made to the malfunction indicator. If the ignition key is in the on position and the engine is off, the lamp will show steady to indicate that the lamp is not broken. It will then start to flash to indicate emission-related malfunctions, their severity and the status of detection mechanisms. The driver can check the lamp and decide if it is worth taking the vehicle for a periodic inspection of the emission system.

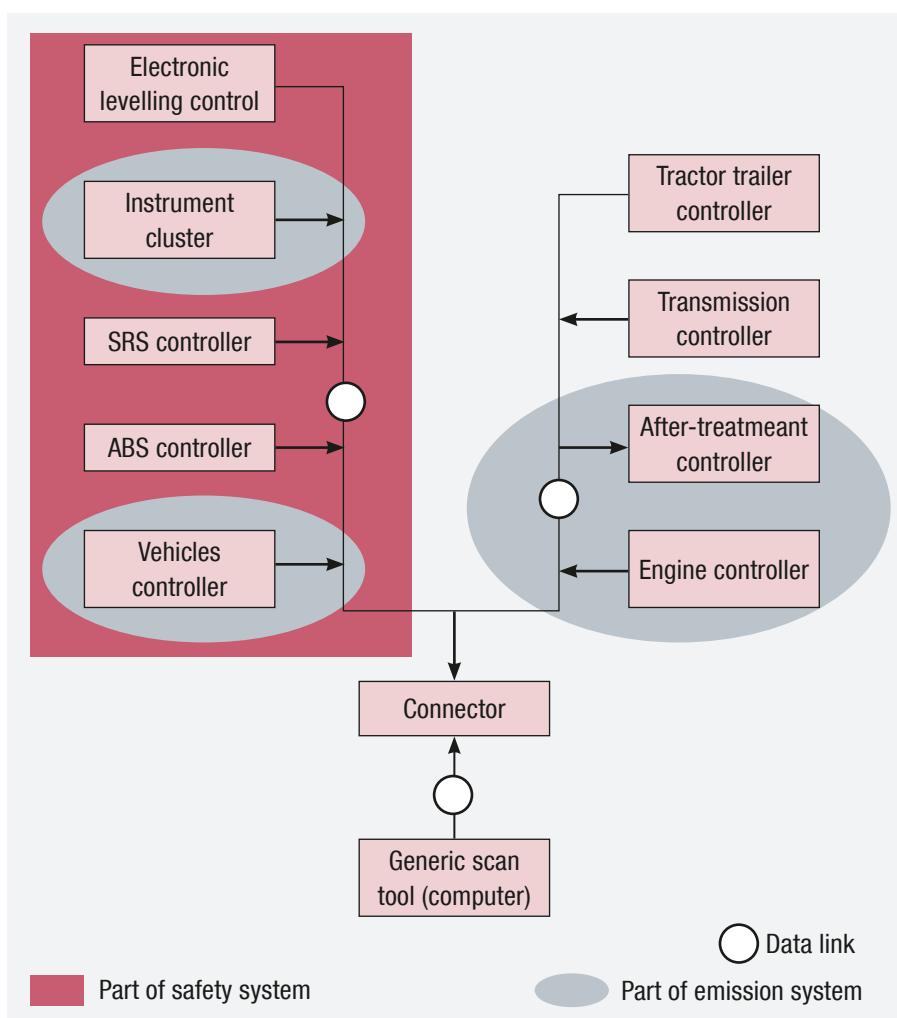


Figure 1: Example of an electrical architecture for emissions and safety systems.

When the engine is running, the malfunction indicator shows if there is a malfunction of such severity that the driver should drive the vehicle to a workshop and have it repaired.

Use-cases

The regulation specifies three different use-cases and the information required to fulfill them:

- Information on engine state or road worthiness, as discussed above
- Information on active emission-related malfunctions which can be used for inspection and maintenance (or periodic inspection)
- Information for repair, which is used in the workshop to trace faults and repair the emission system.

The GTR has recently been updated from the Euro VI regulation. It now includes a use-case to read information on in-use performance data showing how often the emission-related malfunction detection mechanism takes place.

For chemical, thermo or physical reasons, it is not possible to make all checks continuously. Another reason is simply that the engine is not running in the specific control mode. While all major monitors are demonstrated during certification of the engine or vehicle, in-use performance data shows how often they work in real life.

Euro VI regulation requires readable use-cases if the exhaust after-treatment system has been tampered with and is no longer working as designed. Use-cases must also provide information to a portable emission measurement system, used by regulators to check emission compliance when the vehicle is new and in the manufacturers' engine test cell and, later, out on the road. These use-cases are covered by data definition in SAE J1979 Digital Annex.

Harmonization

The task for ISO technical committee ISO/TC 22, *Road vehicles*, subcommittee SC 3, *Electrical and electronic equipment*, working group WG 1, *Data communication*, was to develop a set of standards which could outline the data exchange between a WWH-OBD compliant vehicle and the service tool (computer).

The scope was to fulfill the requirements of the GTR. Even if the Euro VI regulation deviated from the GTR and was developed later, the work also covered the requirements by using new data parameters.

The resulting standards contain information documented in the digital annexes of the Society of American Engineers SAE J1979 (for example, data stream parameters) and SAE J2012 (diagnostic trouble codes). The intention is to re-use what is already standardized or to propose



new data in such way that it could also be used for the current legislated OBD protocol for cars, and also to allow for an expansion to cover future requirements.

Parts of the information documented in SAE J1939 can also be re-used as fault code identifiers. This is a partly harmonized solution for American and European trucks and opens the way to a harmonized solution for both trucks and cars.

Best practice guidelines

The ISO 27145 series of standards, published under the general title, *Road vehicles – Implementation of World-Wide Harmonized On-Board Diagnostics (WWH-OBD) communication requirements*, has four elements :

- Part 1, which includes general information and the use-cases specified by the GTR
- Part 2, which defines the common data dictionary – the type of data needed to fulfill the GTR
- Part 3, which defines the common message dictionary – the subset of the diagnostic services needed to fulfill regulated OBD
- Part 4, which defines communication between a vehicle ECU and the service tool.

ISO 27145-1, *World-Wide Harmonized On-Board Diagnostics (WWH-OBD), General information and use case definition*, specifies and explains the different use-cases from GTR. The document does not cover Euro VI use-cases. It explains





the VOBD concept and shows different communication set-ups.

ISO 27145-2, *World-Wide Harmonized On-Board Diagnostics (WWH-OBD), Common data dictionary*, presents the data parameter types data identifier, routine identifier and diagnostic trouble codes (DTC). The current version of the document covers only emission-related information.

The standardized data identifiers and routine identifiers are developed and documented in cooperation with SAE, where

the document SAE J1979-digital annexes is maintained.

The data identifiers can be used to read real-time data such as engine revolutions per minute and ambient temperature. They are also used in a stored freeze frame in which a set of parameters is stored when the engine control module (computer) detects a malfunction. This can help the service technician to find the root cause of a problem.

DTCs for the identification of malfunctions are documented in SAE J2012-digital

annexes or SAE J1939. ISO 15031-5, *Road vehicles – Communication between vehicles and external equipment for emissions-related diagnostics – Part 5: Emissions – related diagnostic services*, which is currently used as one of the regulatory OBD protocol, uses 2-byte codes but the new protocol in the ISO 27145 series uses three bytes. Many currently defined trouble codes are re-used in the new protocol, but in another format.

ISO 27145 could become the worldwide standard for both cars and heavy duty vehicles.

ISO 27145-3, *World-Wide Harmonized On-Board Diagnostics (WWH-OBD), Common message dictionary*, defines the service tool used to read the data needed. These are a subset of the services contained in ISO 14229-1:2012, *Road vehicles – Unified diagnostic services (UDS) – Part 1: Specification and requirements*, which is a standard widely adopted for cars. The advantage is that the service tool will read the same data and use the same services as that of the vehicle manufacturer's own service tool, eliminating any programming errors and improving the quality of information.

ISO 27145-4, *World-Wide Harmonized On-Board Diagnostics (WWH-OBD), Connection between vehicle and test equipment*, describes the procedure for the start of communication between service tool and vehicle.

Two more parts may be developed in the future : ISO 27145-5, which is the conformance test standard to test that both vehicle applications and the tools reading the information from the vehicle are working according to the standard; and ISO 27145-6, the standard covering which information the equipment should read, and how.

What next ?

Although the European emission regulation has only adopted ISO 27145 for heavy vehicles, discussions have started with regulatory authorities in California on the protocol's use in cars. The ultimate goal would be for it to become the worldwide standard for both cars and heavy duty vehicles. This would have a significant impact, improving vehicle servicing and road safety globally, improve the environment by making it easier to repair the vehicle and reducing costs. ■

About the authors



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Volker Rabe
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2002-2005, and joined Freightliner Ltd (today Daimler Trucks North America) in 2005, in Portland. Mr. Rabe is a member of ISO/TC 22/SC 3 and the leader of ISO/TC 22/SC 3/WG 1 / Task Force, *Diagnostic communication over Internet Protocol*, and a member of SAE Vehicle E/E System Diagnostics Standards Committee. At his current position in Group Research, Mr. Rabe is responsible for developing diagnostic communication protocols as well as protocols allowing V2G communication needed to build a charging infrastructure for Electric Vehicles.

Sustainable mobility



by Egbert Fritzsche

While accepting and respecting the global trend of ever-rising mobility, society and policy must make growth sustainable. We therefore need to reduce transport's energy consumption and environmental impact, and embrace renewable energy. ISO technical committee ISO/TC 22, *Road vehicles*, subcommittee SC 21, *Electrically propelled road vehicles*, is supporting the alternative propulsion needed for long-term mobility.

A key aspect of today's society, mobility affects life and the quality of life in a fundamental way. Transport is used for business, shopping, entertainment and education. Goods transport is essential for the supply and existence of our cities and industry.

However, increased mobility brings costs, notably greater consumption of non-renewable fossil fuels and increased environmental degradation.

Scientists, engineers and developers are working hard to make transport more sustainable – giving people the benefits of increased mobility, but without the costs.

On the road to sustainability

There are many ways to make mobility sustainable. Information exchanges between vehicles and infrastructure, and from vehicle to vehicle, for example, may help to avoid traffic congestion, increase logistical efficiency and improve road safety.

Vehicles themselves need to be optimized to reduce their energy consumption and emissions. Alternative propulsion systems must be introduced to complement and partly replace combustion engines.

The automotive industry has taken the lead in this process. But it is essential that research and development (R&D) continue to focus on a variety of technologies and applications. For this reason the automotive industry follows the “fan-strategy” (see **Figure 1**).

Why International Standards ?

The automotive industry is a global business for which international orientation for new technologies is a must. Therefore sustainable mobility measurements need to be accompanied by International Standards. These are essential for safety.

Interfaces must be ensured by suitable standards specifying key issues. Quality standards guarantee the satisfaction of users

and measurement standards are necessary to compare the performance of systems, components and vehicles.

More than 20 years ago, the automotive industry began R&D on fuel cells as an alternative propulsion system for vehicles. Today, lithium-ion battery technology has given electrical propulsion systems a major boost.

The electric power train requires a lot of new standards. To meet this challenge, ISO/TC 22 *Road vehicles*, has therefore concentrated standardization work in one specific subcommittee, ISO/TC 22/SC 21, *Electrically propelled road vehicles*.

Beyond safety

Safety issues for electric vehicles are standardized by working group WG1, *Vehicle operation conditions, vehicle safety and energy storage installation*. The suite of safety standards ISO 6469, *Electrically propelled road vehicles – Safety specifications*, Parts 1-3, covers electrical safety for all kinds of electrical propulsion systems in road vehicles.

While Part 1 covers all safety aspects for a rechargeable on-board energy storage system, such as batteries and capacitors, Part 2 is related to vehicle operational safety. Part 3 specifies protection against electrical shock.

Only hydrogen safety is covered in another standard, ISO 23273-2, *Fuel cell road vehicles – Safety specifications – Part 2: Protection against hydrogen hazards for vehicles fuelled with compressed hydrogen*.

There are many ways to make mobility sustainable.

The correct terminology for electrically propelled vehicles is another important topic. ISO technical report ISO/TR 8713, *Electrically propelled road vehicles – Vocabulary*, covers all terms and definitions used in the standards of ISO/TC 22/SC 21. It provides a useful reference work for all experts in standardization and helps them to avoid misunderstandings.

SC 21/WG 2 is responsible for the measurement of performance, emissions and energy consumption of vehicles with an electric propulsion system. This working group is currently working on ISO 23274, *Hybrid-electric road vehicles – Exhaust emissions and fuel consumption measurements*, “for non-external chargeable”

Electrically propelled road vehicles

Subcommittee SC 21 covers all categories of vehicles within the scope of ISO/TC 22, when they are entirely or partially propelled by electric motors and carry a source of electrical power/energy for vehicle propulsion. The scope of SC 21 includes:

- Vehicle operation
- Vehicle safety
- Vehicle energy performance
- Vehicle performance measurements
- On-board electric energy storage for propulsion
- The safety of persons against electrical and other hazards specific to electric propulsion
- Terminology and definitions.

SC 21 has a holistic and systematic approach. To ensure all issues are fully covered, SC 21 operates three active working groups.

Other ISO/TC 22 subcommittees handle specific automotive standards for mopeds and motorcycles, and standards related to components such as cables, fuses, connections and connectors.

(Part 1) and “external chargeable” (Part 2) hybrid electric vehicles (HEV).

Technical reports for “maximum speed measurement procedure” for fuel-cell vehicles and “charge balance measurement” for HEVs were published a few years ago.

With the arrival of new lithium-ion based battery systems, SC 21/WG 3 has recently been created and made responsible for automotive traction battery systems and, in particular, test procedures.

It is essential to evaluate the suitability of a battery system for automotive use. ISO 12405, *Electrically propelled road vehicles – Test specification for lithium-ion traction battery packs and systems*, aims to specify unique test procedures for battery systems, enabling the comparison of the test results even if the tests themselves are carried out in different labs or by different users. The standard covers all relevant criteria for the quality, performance and safety of automotive battery systems (see **Figure 2**).

SC 21/WG 3 is responsible for specifying a designation system for automotive

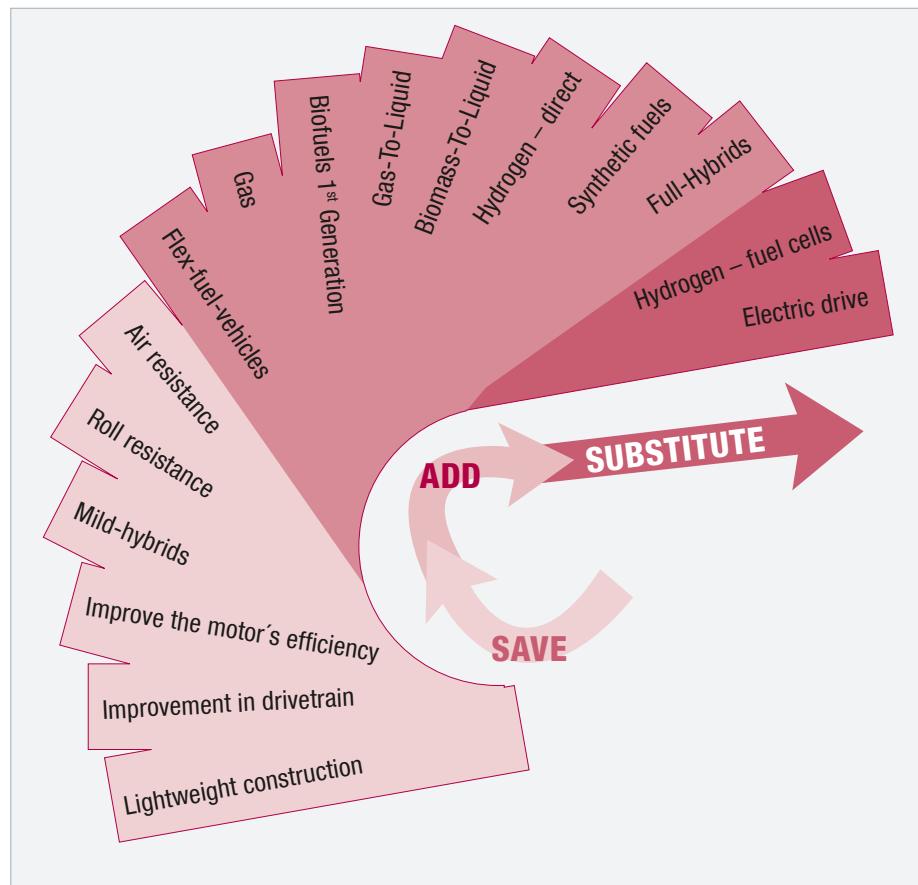


Figure 1 : Automotive industry fan-strategy to achieve sustainability.

Glossary (Figure 1) :

Save means that vehicles have to be improved to minimize energy consumption. Methods include reducing vehicle weight and air and rolling resistance.

Add means that current fossil fuel-based combustion engines need to be improved so they can also run on different fuels such as bio fuels. Mineral-based fuels can be replaced by bio fuels or synthetic fuels produced from biomass.

Substitute means replacing traditional combustion engines partly or totally by electric powertrains.

in IEC/TC 69 is required. Cooperation may also be necessary with other IEC committees for other issues related to electro-technical standardization. As a result, the presidents of the two organizations have recently signed a Memorandum of Understanding.

According to this agreement, ISO/TC 22 focuses on all automotive related issues and will not work on global electro-technical standards. For instance, ISO/TC 22 will

Cooperation with the IEC

For the electric vehicle’s connection with the public electrical power net (grid), close cooperation with the standardization experts

Overview of tests			
General tests (Clause 6)	Performance tests (Clause 7)	Reliability tests (Clause 8)	Abuse tests (Clause 9)
Preconditioning cycles (Clause 6.1)	Energy and capacity at room temperature (Clause 7.1)	Dewing (Clause 8.1)	Short-circuit protection (Clause 9.2)
Standard cycle (Clause 6.2)	Energy and capacity at different temperatures and discharge rates (Clause 7.2)	Thermal shock cycling (Clause 8.2)	Overcharge protection (Clause 9.3)
Standard discharge (Clause 6.2.2.2)	Power and internal resistance (Clause 7.3)	Vibration (Clause 8.3)	Overdischarge protection (Clause 9.4)
Standard charge (Clause 6.2.2.3)	No-load SOC loss (Clause 7.4) SOC loss at storage (Clause 7.5) Cranking power at low temperature (Clause 7.6) Cranking power at high temperature (Clause 7.7) Energy efficiency (Clause 7.8) Cycle life (Clause 7.9)	Mechanical shock (Clause 8.4)	

Figure 2: Test plan according to ISO 12405-1.

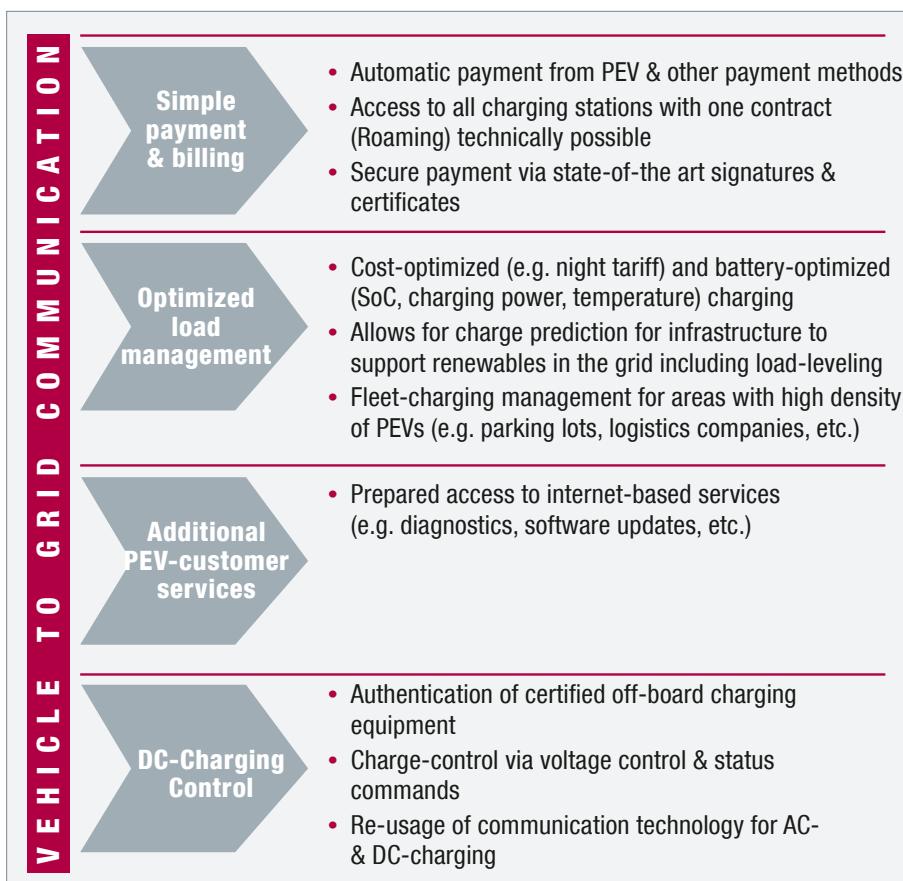


Figure 3: Summary of use-cases for electric vehicle charging as the basis for the communication standard.

not develop a generic standard to specify a lithium-ion battery ; but ISO/TC 22 will certainly specify the requirements for automotive traction batteries for electric and hybrid electric vehicles.

ISO and IEC are also working on some joint projects. The most important of these is specifying the communication process required to charge the electric vehicle with power from the grid. This standard package will define the use-cases, communication protocol and the communication means to manage the complete charging process safely, and to ensure the correct billing process (see Figure 3). ■

About the author



Egbert Fritzsche is Head of Standardization at VDA, Germany. A chartered engineer, he is also Secretary of ISO/TC 22/SC 21.

Greener fuels

How alternatives to oil are gaining ground



Of the more than one billion road vehicles in use worldwide, 95 % run on oil.

However, with growing concerns about pollution, environmental sustainability, supply security and costs, there is increasing interest, research and investment in alternative fuels. International Standards play a crucial role in promoting the development and dissemination of new technologies.

ISO standards :

- Act as a vehicle for spreading innovative knowledge and best practice
- Help to open up markets by encouraging standardized infrastructure
- Boost markets through the greater acceptance and proliferation of new technology, and the resulting economies of scale.

Here we look at some key ISO initiatives for alternative fuels.

Natural gas fuelling stations

by Maria Lazarte

ISO is developing standards for natural gas fuelling stations for vehicles, urgently needed by the industry to facilitate the spread of this technology. The work is being carried out by ISO project committee ISO/PC 252, *Natural gas fuelling stations for vehicles*.

The committee will develop two standards, focusing respectively on fuelling stations for compressed natural gas (CNG) and liquefied natural gas (LNG), and covering the design, construction and operation of these stations, including provisions for equipment, safety devices and maintenance.

CNG and LNG vehicle fuels are being used in many countries as greener alternatives to gasoline, diesel and propane. In 2010, there were more than 12 million natural gas vehicles worldwide¹⁾, mostly in developing countries.

Since natural gas is lighter than air and disperses quickly when released, CNG is also safer than traditional fuels in the event

of a spill. In many countries there is rapidly increasing use of CNG-fuelled buses.

LNG is being used in Japan, South Korea, the United Kingdom and the USA. In addition, renewable biomethane can be liquefied to be virtually the same as LNG. It is expected that LNG will become more widely used, particularly for heavy vehicles.

Martin Seifert, Chair of ISO/PC 252, has stressed the urgency of the market need for standards, "With growing concerns about the security and availability of the oil supply, local air pollution and greenhouse gases, more and more vehicles are being developed and manufactured to run on CNG and LNG," he said.

"However, despite their many advantages, CNG and LNG vehicles are restricted by the limited infrastructure available for delivery and distribution at fuelling stations.

"ISO will harmonize requirements for such infrastructure and facilitate its development

around the world. The standards will open up global markets for this cleaner new technology."

The standards are being developed in response to a request originally submitted by the International Association for Natural Gas Vehicles. Their proposal followed agreements by the ISO roundtable on global harmonization of regulations, codes and standards for gaseous fuels and vehicles, held in Geneva, Switzerland in 2007. ■

Maria Lazarte is Assistant Editor, *ISO Focus+*



1) Wikipedia.org

Hydrogen vehicles gain ground

by Randy Dey

As hydrogen infrastructure expands to support the use of hydrogen and fuel-cell vehicles, technical committee ISO/TC 197, *Hydrogen technologies*, is playing a major role in advancing the commercialization of these hydrogen technologies.

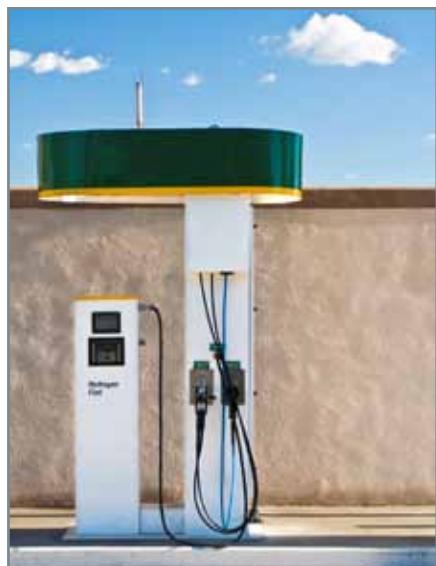
In a high-level forum of automotive industry leaders organized at the invitation of the ISO President in December 2011, industry decision-makers were exposed to the strategic importance of existing and planned work in ISO committees for the car of the future. ISO/TC 197 took part in this event to present its work and the challenges ahead.

Fuelling connectors (WG 5)

Hydrogen connectors are critical to the safety of the refuelling operations of hydrogen vehicles. This is why it was so important to reach consensus on the profile applying to the 70 MPa nozzle used in fuelling stations, and on the associated vehicle-based receptacle.

At the start of the latest round of ISO negotiations, an ISO/TC 197 workshop invited stakeholders to learn about the connector-related experiences of connector manufacturers, automotive original equipment manufacturers (OEM) and gas suppliers/fuelling station operators.

This workshop guided the next steps of the revised ISO 17268, *Gaseous hydrogen land vehicle refuelling connection devices*, which is about to be launched as a final draft International Standard.



On-board tanks (WG 6)

The committee is continuing to build global consensus on the provisions that apply to on-board gaseous fuel tanks included in ISO/DIS 15869, *Gaseous hydrogen and hydrogen blends – Land vehicle fuel tanks*. In this case, it is important to develop a position that rallies fuel-tank manufacturers and automotive OEMs.

We are working towards a document that gives OEMs the flexibility they want for a more performance-based approach, but without compromising fuel-tank safety. This will be achieved by retaining the stress ratio and other key safety considerations deemed important by tank manufacturers.

Hydrogen fuelling stations (WG 11)

With the planned deployment of hydrogen fuelling stations worldwide, it is important that ISO/TC 197 agree on applicable safety provisions to help streamline the approval process. A lot of work is going into ISO 20100, *Gaseous hydrogen – Fuelling stations*, to reach consensus on important items such as separation distances, which will allow the building of hydrogen fuelling stations in cities without compromising operational safety.

Hydrogen fuel (WG 12)

ISO 14687-2, *Hydrogen fuel – Product specification – Part 2: Proton exchange membrane (PEM) fuel cell applications for road vehicles*, is nearing publication. Fuel quality interests all stakeholders, namely fuel providers, fuelling station retailers, OEMs and fuel-cell manufacturers. It is important that agreement be reached on the permissible level of fuel contaminants



as this will affect several aspects of the hydrogen industry.

Serving industry

The industry will be well served when comprehensive International Standards are available to guide the design and approval of new infrastructure and vehicle technologies. Through its programme, ISO/TC 197 is working towards this goal. ■

Randy Dey is Chair of ISO/TC 197 on hydrogen technologies.



Gas storage for new fuels

by Rohintan S. Irani and Hervé Barthélémy

In the quest for cleaner, greener transport, compressed natural gas (CNG) is being increasingly used as fuel for all kinds of vehicles. To help this technology gain ground, ISO technical committee ISO/TC 58, *Gas cylinders*, has developed standards for on-board fuel storage.

Furthermore, the committee is working together with ISO/TC 197, *Hydrogen technologies*, to create standards for emerging hydrogen-powered vehicles, both for on-board storage and stationary storage at filling stations. The innovative hydrogen vehicles are normally powered by a fuel cell, so their only exhaust product is water, a major plus for the environment.

Storing CNG

Globally, almost 25 million CNG cylinders are used in vehicles, a figure expected to reach 65 million by 2020. Of these, 95% (over 23 million) are seamless steel cylinders (see **Figure 1**), the rest being of composite construction. Such a disproportionate percentage merits special mention.

Although their light weight is a key advantage of composite cylinders, the attraction of seamless cylinders is their comparatively low price. A seamless cylinder's weight can be minimized by careful control of wall thickness, which is why suppliers choose cylinders made from cold deep-drawn plate.

International Standards play a crucial role.

Hoop-wrapped composite cylinders (reinforcing fibres on the cylindrical portion only) with plate liners are 30% lighter than seamless cylinders. Even lighter, but more expensive, are fully wrapped cylinders.

ISO 11439:2000, *Gas cylinders – High pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles*, outlines specifications for manufacturing all types of automobile CNG cylinders – seamless or composite.

Their periodic inspection and requalification is covered by ISO 19078:2006, *Gas cylinders – Inspection of the cylinder installation, and requalification of high*

pressure cylinders for the on-board storage of natural gas as a fuel for automotive vehicles.

Storing hydrogen

The collaboration of ISO/TC 58 and ISO/TC 197 under a joint working group (WG 6) under the leadership of ISO/TC 197 has resulted in the publication of technical specification ISO/TS 15869:2009, *Gaseous hydrogen and hydrogen blends – Land vehicle fuel tanks* (soon to become an ISO standard), for hydrogen vehicles.

More recently, several ISO/TC 58 experts are contributing within ISO/TC 197 working group WG 15, *Gaseous hydrogen – Cylinders and tubes for stationary storage*, to the drafting of a new standard for stationary vessels for filling stations. This aims to solve fatigue issues linked to the high number of pressure cycles involved.

ISO/TC 58/WG 7, *Compatibility between gases and materials*, is also working on hydrogen embrittlement testing methods to solve material compatibility issues at these high pressures.

And more

Finally, ISO technical committee ISO/TC 220, *Cryogenic vessels*, is working on liquefied natural gas for on-board applications.

ISO/TC 58, ISO/TC 197 and ISO/TC 220 are working hard to deliver the specifications that will facilitate the global spread of cleaner, planet-friendly fuels. ■



Figure 2. A typical fully wrapped composite cylinder for automotive CNG application.

Dr. Rohintan (Roy) S. Irani is Convenor, ISO/TC 58/SC 4, *Operational requirements for gas cylinders*, working groups WG 3, *Methods for inspection and requalification of NGV fuel gas containers*, WG 10, *Inspection and testing of composite cylinders*, and WG 11, *Periodic inspection and testing of seamless steel and seamless aluminum alloy gas cylinders*.



Dr. Hervé Barthélémy is Convenor of ISO/TC 58 working group WG 7, *Compatibility between gases and materials*, and Chair of ISO/TC 220, *Cryogenic vessels*.

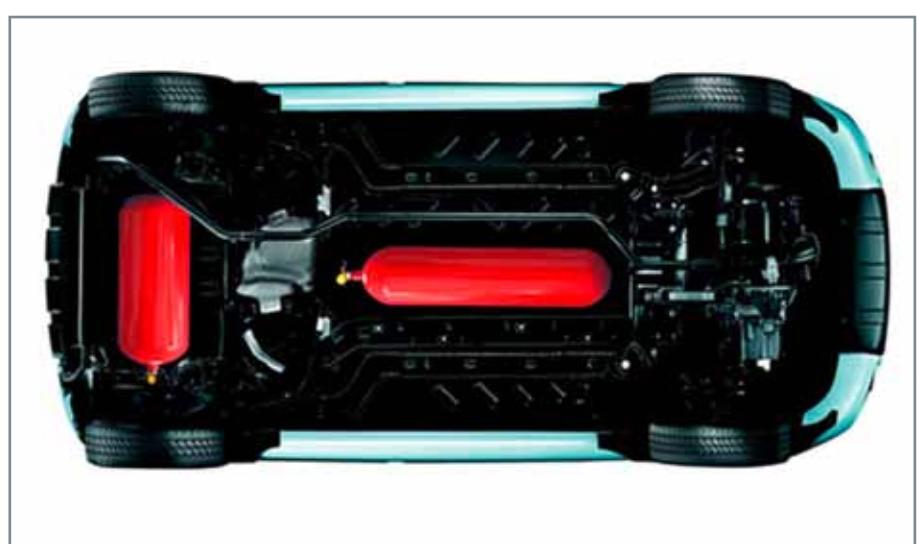


Figure 1. An example of two seamless CNG cylinders in a car.



Farewell to Roy Phillips

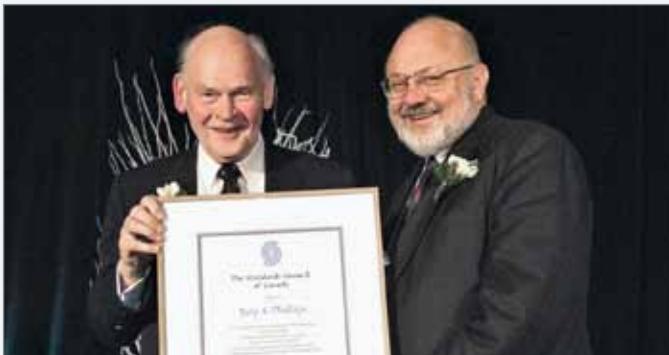
Roy Phillips, former President of ISO, passed away on 5 January 2012, aged 93.

Mr. Phillips had a distinguished career in engineering and business that spanned five decades. After 25 years at GE, he became President of the Canadian Manufacturers Association in 1975, a position he held for 10 years. During this time, he also became involved with the Correctional Services of Canada as Chair of the Advisory Committee on Inmate Employment. In 1985, he was elected President of ISO.

Through his dedication and commitment, Mr. Phillips symbolized the importance of international standardization work – leading Canada into the international forum and setting the benchmark many Canadian volunteer committee members now uphold.

As ISO President, he travelled the world, from Russia to China, to Indonesia, forging new directions in international trade and policy. In 1986, he received the Order of Canada.

In 2002, at the National Standards System Conference held in Mount Saint-Anne, Québec, the Standards Council of Canada introduced a new award: The Roy A. Phillips Award. This award salutes individuals whose contributions have gained Canada recognition as a world leader in international standardization.



In 2002, SCC commemorated the achievement of Mr. Phillips (pictured here with the then SCC Executive Director Peter Clark) by naming an award in his honour.



New ISO/CASCO Chair

Lane Hallenbeck is the new Chair of the ISO Committee on conformity assessment (ISO/CASCO), as of January 2012. He is Vice President for Accreditation Services at the American National Standards Institute (ANSI), responsible for the direction of internationally recognized accreditation services.

In this role, he has led multiple accreditation programme development efforts, creating and expanding public-private partnerships between industry and government. Mr. Hallenbeck also has a strong record of customer service in conformity assessment process and system implementation.

He has been actively involved in conformity assessment fora at the international level for many years, including the International Accreditation Forum (IAF), Pacific Accreditation Cooperation

(PAC), InterAmerican Accreditation Cooperation (IAAC) and in ISO, with ISO/CASCO.

Mr. Hallenbeck's prior experience includes many years of technical leadership, including as Vice President of the management systems registrar affiliate of the American Bureau of Shipping, and Program Manager for the TRW Space & Electronics Group.

Mr. Hallenbeck was president of the Independent Association of Accredited Registrars (IAAR) from 1997 to 1999. He holds an MS in Technology Management from Pepperdine University and a BA in Life Sciences from the University of Colorado at Boulder, and has also been certified as a Quality Systems Lead Auditor.

French-speaking African NSBs' drive for unity

The first regional Forum for Chief Executive Officers of National Standards Bodies (NSBs) in French-speaking Africa was held in Yaoundé, Cameroon, in November 2011.

The Minister of Industry, Mines and Technological Development of Cameroon, Babel Ndanga Ndinga, opened the Forum, which brought together the executives of NSBs of some 15 French-speaking African countries, with a view to sharing experience on the best standardization practices, enhancing regional cooperation and improving the competitiveness of African economies.

In his inaugural address to the Forum, Charles Booto à Ngon, the Director General of ANOR, Cameroon's Standards and Quality Agency, warmly thanked ISO for holding this meeting which aimed to give a new impetus to national standards bodies in African countries. He commented: "Yaoundé's work will undoubtedly constitute an outstanding window of opportunity for sharing experience".

This is the third Forum for the CEOs of NSBs, organized by ISO across different regions of the world, allowing the highest level executives to network and benefit from each other's experience. As Rob Steele, ISO's Secretary-General, emphasized: "There is an extraordinary enthusiasm among the ISO members of the French-speaking group to play a greater part within ISO and I strongly encourage our members to rely not only on what ISO can offer, but also on the support of other members such as AFNOR".



Cover page of the Normes & Qualité magazine, November 2011.

Next IEC General Secretary and CEO

The International Electrotechnical Commission (IEC) has announced that Frans Vreeswijk has been appointed by the IEC Council as the next General Secretary and CEO of the IEC. Mr. Vreeswijk will succeed Ronnie Amit in the position in October 2012.

Mr. Vreeswijk will begin his duties as Deputy General Secretary in March 2012, and assume his full role as General Secretary and CEO at the 2012 General Meeting in Oslo, Norway. Mr. Amit will remain available as a special adviser to the IEC President for a period to assist in the transition.

Mr. Vreeswijk is currently President of the Dutch National Committee (NEC) to the IEC, and a board member of the Dutch National Committee (NEN) to ISO. ■



Frans Vreeswijk, future IEC General Secretary

Lane Hallenbeck, the new Chair of ISO/CASCO



Manage your energy well and you've more to devote to your customers

ISO 50001 for energy management.

The kangaroo is very energy efficient. It can reach speeds of more than 50 km/h while using less energy than any other mammal. So mother kangaroos have more energy for looking after junior! Translate that into business terms. If your organization can reduce the energy it needs to operate, it can devote more resources to value-adding processes.



ISO 50001 users are reporting that the standard helps them to increase energy efficiency and cut costs. Improve your organization's energy management and you can concentrate more on ensuring the satisfaction of your customers.

Who'd have thought that the kangaroo had something to teach CEOs?

ISO 50001:2011, Energy management systems, is available from ISO national member institutes (listed with contact details on the ISO Website at www.iso.org) and ISO Central Secretariat Web store at www.iso.org or e-mail to sales@iso.org.

International Organization for Standardization – www.iso.org

Central Secretariat
1, ch. de la Voie-Creuse
Case postale 56
CH-1211 Genève 20





Photo: Bentley

The new Bentley Continental GT V8, launched at the North American International Auto Show, Detroit, in January, 2012, exemplifies the company's energy savings targets by achieving a 40% improvement in fuel economy.

Bentley first with ISO 50001

Car maker implements energy management standard

by Michael Straughan

Bentley, one of the most famous automotive marques, combines fine craftsmanship with engineering expertise and cutting-edge technology to create some of the world's finest motorcars. However, the company's pursuit of excellence does not stop with the turn of the ignition key. Energy management is a fundamental area of focus and Bentley Motors has now become the first United Kingdom automotive plant to implement and certify to ISO 50001:2011 *Energy management systems – Requirements with guidance for use*.

For Bentley, leadership is not just about being the major player in the high-end luxury automotive sector, it is also about leading the sector in other aspects – skills, employment and, increasingly, environmental performance.

Like any competitor, we are judged on results. Our track record, however, is good. We were one of the first UK plants to achieve ISO 14001 certification for environmental

management, the first in our sector to set out a clear strategy for reducing our impact on the environment, and we are now the first UK automotive plant to certify to the new ISO 50001 energy management standard.

For Bentley to achieve these certifications, and be the first in its sector to do so, is no mean feat. Unlike most car companies, all Bentley's operations – from design through engineering and production and

on to sales and marketing – take place at a single location in Pym's Lane, Crewe, in the United Kingdom.

This historic site dates back to 1938, when its initial purpose was to build the famous Merlin aeroplane engines for the Royal Air Force (RAF) during the Second World War, followed by the switch to car production in 1946. The takeover of the company by Volkswagen in 1998 saw a period of sustained investment both in new products and facilities, but most of the buildings themselves are remnants of another era.



Photo: Bentley
Michael Straughan, Board Member, Manufacturing, Bentley Motors.

Today, the company employs around 4 000 people at the Pyms Lane site, producing high performance luxury cars for established markets in Europe and the USA, as well as emerging markets such as China and South America.

21st century standards

The challenge has always been, therefore, to bring the famous plant up to the standards of 21st century motor manufacturing. Achieving ISO 50001 certification is proof of this commitment.

As Bentley's car production increased ten-fold between 2002 and 2007, there was no commensurate increase in our environmental impact, meaning that energy costs per vehicle plummeted over the same period, helping the bottom line.

The ISO 50001 system runs in real time.

ISO 50001 implementation was the logical next step. To fulfil the requirements of the new International Standard, we began by conducting a gap analysis, the basis on which our improved energy monitoring system (EnMat) was developed. This system runs in real time providing detailed information on energy usage across the site, monitored by the environmental management team and distributed to local energy champions. From this we are able to observe energy output.



Photo: Bentley

Bentley has reduced water consumption by half in the body coating process as part of its ISO 50001-based energy management and ISO 14001-based environmental management systems.

Unexpected energy use

One interesting initial result was the higher than expected amount of energy being used in our offices, so by monitoring we have been able to target these areas and develop local energy targets. This has provided us with an easy opportunity to reduce energy consumption. Another advantage of our new energy monitoring system is that it offers the ability to identify changes in energy use not only at site level, but also by technology area. Any spikes in energy from a particular area can now be investigated in the same way as any other incident.

Once the overall analysis was completed, a series of initiatives were undertaken such as improved heating and lighting, better controlled boiler and compressed air systems, greater insulation, and more efficient variable speed drives on new cars.

The introduction of an ISO 50001-based system has also influenced our approach to energy management. We now calculate our payback rates differently, not just by costs, but also by carbon costs. When purchasing new machinery, the preferential options will always be those recommended by the UK's Carbon Trust, which allows us to benefit from certain tax incentives.

Energy review meetings are held monthly.

We have also enhanced communication across the site by establishing energy champions. Energy review meetings are held monthly, with representation from senior management levels, so information is readily available across the company. This also ensures that a level of energy management is established from top to bottom.

Significant results

The results of these activities have been significant. Between 2000 and 2010, the energy used on site for each car produced was reduced by two thirds, and by 14% for the overall site. This has delivered savings of 230 GWh of energy – or in real



Photo: Bentley

Energy saving initiatives at Bentley's ISO 50001 certified manufacturing plant have resulted in a two thirds reduction in energy used for each car produced and a 14% cut overall, delivering savings of 230 GWh—enough to power 11 500 houses for a year.



Photo : Bentley

Bentley Motors has a rich motor racing history. Here, (left to right) are Frank Clements, W.O. Bentley, and John Duff with the 1924 Le Mans winning 3-litre Bentley, the first of five victories from 1924 to 1930.

terms – enough to power 11 500 houses for a year. These performance figures have been verified in a complex audit carried out by independent certification body Lloyds Register Quality Assurance.

The company is currently achieving a waste recycling rate of 77%.

Beyond energy management, Bentley is also reducing the impact of the plant on the environment in other areas. The company's

waste recovery and recycling strategy is currently achieving a recycling rate of 77%, quickly approaching Bentley's target of 80% recycling. Water usage is also being reduced, for example in the body coating process where consumption has been halved over the past decade and where we have plans to improve this performance still further.

Improved fuel economy

The impact of the site on the local environment is also seriously considered. One aspect of this involves minimizing vehicle traffic in the Pyms Lane area where our site

is based. The company's award winning "green travel policy" provides incentivized alternatives to driving to work as the single occupant of a car. Despite being a car company with a generous car scheme (although not providing Bentleys!), around 19% of employees cycle to work.

Of course, society will always judge Bentley on the environmental performance of its products. Developing our models to make them more environmentally efficient is therefore fundamental to our future product plans. This was the rationale behind our environmental strategy announced in 2008.



Photo : Bentley

With 2012 as a target, we promised to reduce the fleet average CO₂ emissions from Bentley models by 15%, to introduce flexfuel compatibility, and to develop a new powertrain that, in itself, will deliver a 40% improvement in fuel economy. I am delighted to say that all of these commitments have either been delivered or, in the case of the fleet emissions, exceeded.

Everybody involved

Our dedication and determination to reduce energy has never been just a paper exercise. It is a determination shared by the entire workforce. Everybody at Crewe has undertaken to manage and monitor their use of energy, since we share a responsibility to the community in which we live and work. This is an area where Bentley likes to lead and one in which we will continue to lead. ■



Over 70 years since the last victory, Bentley returned to win first and second places at Le Mans in 2003. The winning car, No. 7, parades through Paris followed by the old 'Blower' Bentleys of the 1930s.

Coca-Cola and management systems

New Russian plant follows company-wide standards integration

Photo: Coca-Cola Hellenic

The new Coca-Cola bottling plant in Russia operates in conformity with ISO 9001, ISO 14001 and ISO 22000.

by Garry Lambert

Coca-Cola's new bottling plant in Russia will be run in conformity with an integrated ISO 9001, ISO 14001, ISO 22000 and OHSAS 18001 based management system being rolled out across all 75 plants in 28 countries, operated by major bottler Coca-Cola Hellenic.

Coca-Cola Hellenic, a major bottler of Coca-Cola Company products, has opened its largest beverage plant in Russia to target a market of some 140 million consumers. The new plant in the city of Rostov-on-Don is the result of a USD 120 million investment programme, creating over 400 jobs, and is part of a plan to invest more than USD 3 billion in the Russian economy over the next five years for long-term sustainable growth.

In constructing the new plant, Coca-Cola Hellenic's main goal was to minimize its impact on the environment by implementing an environmental management system in conformity with ISO 14001 to improve water efficiency, save energy, recycle more production waste and send less to landfill.

Among many such measures designed into the new plant is a 1 600 m² water cleaning facility, reportedly the most powerful in Russia, to gather water for repeated use after backwashing through sand filters, and reduce total consumption.

Standards integration

Coca-Cola Hellenic operates 75 plants in 28 European countries, serving approximately 560 million people, and achieves annual sales of more than two billion unit cases of famous brands including Coca-Cola, Fanta, Sprite, Nestea and Schweppes. The company is rolling out a multi-faceted management system across the organization that

integrates the ISO 9001 quality, ISO 14001 environmental, ISO 22000 food safety and OHSAS 18001 (non-ISO) operational health and safety standards, and is currently looking at aligning with ISO 26000 guidance on social responsibility.

Integrated ISO 9001, ISO 14001, ISO 22000 and OHSAS 18001 management system.

Company-wide environmental improvements achieved since implementing ISO 14001 have been impressive. To ensure water sustainability, each bottling plant conducts risk assessments of water resources, and as a result absolute water use has dropped despite increased production volume. By the end of 2010, 99% of all plant wastewater was being treated.

The organization's energy-savings initiatives, including its commitment to construct 20 on-site combined heat and power units, have improved plant energy efficiency by 23% since 2004. Also, CO₂ emissions are expected to fall by 25% by 2015, compared to 2004.

Coca-Cola Hellenic operates 75 plants in 28 European countries.

Total waste to landfill has dropped by 58% since 2004 and 85% of production waste is recycled, with much of the PET plastics reused in making new bottles. In addition, PET bottles are 16% lighter than in 2004 and consume less raw material.



Coca-Cola Hellenic's new plant in Rostov operates a 1 600 m² water cleaning facility, reportedly the most powerful in Russia.



An operator monitors a bottling line at the new Coca-Cola bottling plant in Rostov, Russia.

Photo : Coca-Cola Hellenic

Benefits

ISO Focus+ asked Gary Brewster, Operational Sustainability Director, Coca-Cola Hellenic, to comment on some of the key benefits of ISO 14001 implementation, and on the integration of several management system standards.

ISO Focus+ : What difference has ISO 14001 made to your company?

Gary Brewster : Before implementing ISO 14001 we had an ad hoc, unstructured approach to environmental management. Since then it has revolutionized the way we operate by challenging us to implement a structured system that defines our environmental responsibilities, involving a focused approach, structured disciplines, management reviews, training, and a requirement to set targets. Another benefit is the increased credibility with our stakeholders – people understand what ISO 14001 means.

ISO Focus+ : What are the key benefits since implementation in 2002 ?

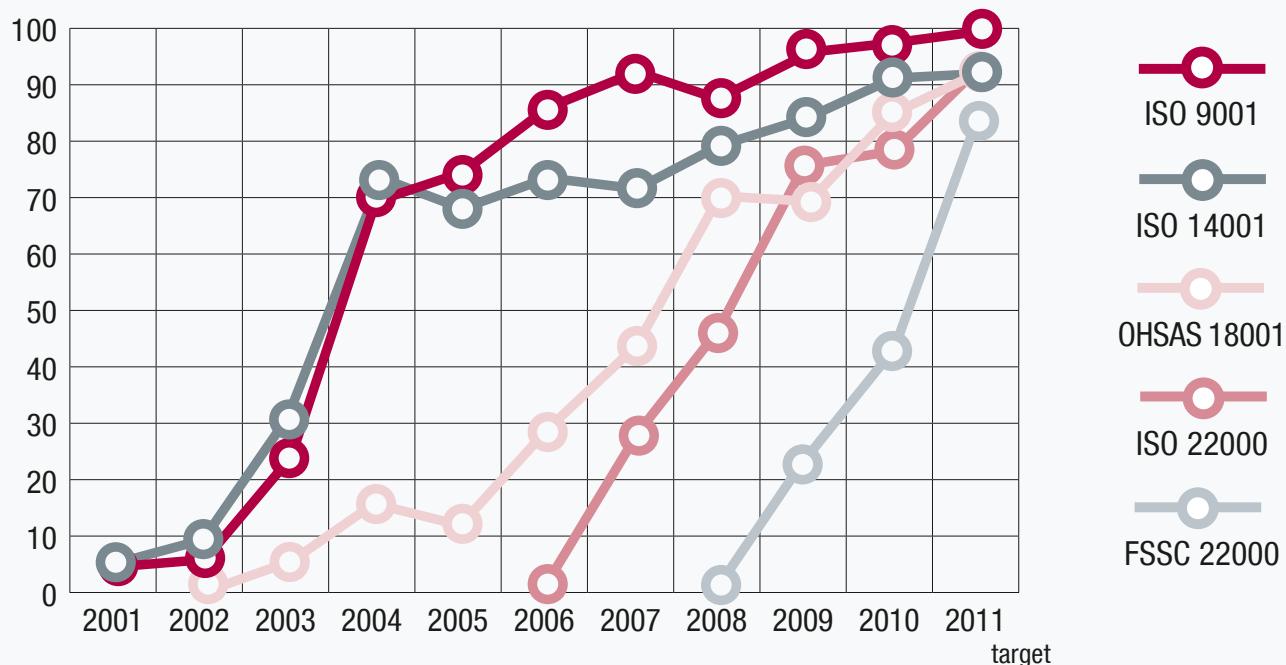
Gary Brewster : To evaluate benefits, we measure the key environmental parameters of water and energy use ratios. We used 3.21 litres of water per litre of beverage produced in 2004, but by year-to-date 2011 water usage was down to 2.2 litres of water per litre of beverage produced – that's a 31% improvement over the period. Energy use has fallen from 0.72 megajoules (MJ) per



Photo : Coca-Cola Hellenic

Certifications of Bottling Plants

(% of plants certified)



Coca-Cola Hellenic plans to have all its 75 bottling plants across the 28-country region certified to ISO 9001, ISO 14001, ISO 22000, FSSC 22000 and OHSAS 18001 by the end of 2012.

litre of beverage produced in 2004 to 0.56 MJ year-to-date 2011 – a 22 % reduction.

ISO Focus+: What is the status of management system certifications across the company?

Gary Brewster: It's a work in progress, rolling out the implementation and certification programme across 75 bottling plants in 28 countries in the Coca-Cola Hellenic region.

Our target is to have 100 % of our plants certified to ISO 9001, ISO 14001, OHSAS

18001, ISO 22000 and the ISO 22000-based FSSC 22000, *Food Safety System Certification*, by the end of 2012.

ISO Focus+: Do you operate all those management standards in an integrated way?

Gary Brewster: Yes, these management systems combine well into one integrated system, which we operate with overall management responsibility, training, document control and internal auditing. However, it would be great if we could have one



Photo : Coca-Cola Hellenic

Gary Brewster, Operational Sustainability Director, Coca-Cola Hellenic.

integrated external third-party audit to cover all the certifications within our system. But we are limited by availability of auditors trained in all of the disciplines. We would like to see the development of an integrated audit structure and the infrastructure to support it. ■

Garry Lambert is a British freelance journalist based in Switzerland.

(Left to right) **George David**, Chairman of the Board of Coca-Cola Hellenic; **Vasily Golubev**, Governor of Rostov Region; **Dmitry Chernyshenko**, President of Sochi 2014 Olympic Committee; **Muhtar Kent**, Chairman of the Board and Chief Executive Officer of The Coca-Cola Company, and **Yury Ugovich Reilian**, Deputy Minister for Russia's Regional Development, officially open the new Coca-Cola plant in Rostov on 26 September 2011.

Road vehicles

Running on ISO standards

by Roger Frost

ISO has just published a new brochure, *ISO & road vehicles*, giving a concise overview of its substantial portfolio of International Standards that share state-of-the-art technology and good practice with the automotive sector worldwide.



"Clearly, with more than a billion estimated road vehicles in use worldwide," the brochure states, "if the automotive sector uses state-of-the-art standards for aspects such as safety, impact on the environment, and requirements for supply chain partners, this can have an enormous impact on all three dimensions of sustainable development – social, environmental and economic."

"The importance of this challenge is reflected by ISO's response. Out of a current total of over 19 000 ISO International Standards for almost all sectors of business and technology, some 900 have been developed for road vehicles and related technologies."

ISO standards provide benefits for manufacturers and supply chain partners; regulators and health authorities; vehicle owners and drivers, and road users including pedestrians. They cover all aspects of road vehicles: safety, ergonomics, performance,

test methods, the environment, and the roll-out of innovative technologies.

The focus of much of this work is ISO technical committee ISO/TC 22, *Road vehicles*, which has so far developed more than 700 standards and updates. These range from standards addressing basics such as wheels, braking systems and road holding ability, to crash protection, child restraint systems and ergonomics. Many aim to improve compatibility, interchangeability and safety, or to provide the requirements for harmonized test procedures for evaluating performance.

Increasingly, road vehicles are integrated with systems and networks based on information and communication technologies with varied objectives such as safety, traffic control, navigation, fee collection and identification. Today's communications capabilities give the potential for vehicles

to foresee and avoid collisions, transmit their position to emergency services in case of an accident, navigate the quickest route to their destination, make use of up-to-the-minute traffic reports, identify the nearest available parking slot, minimize their carbon emissions and provide multimedia communications.

ISO/TC 204, *Intelligent transport systems*, is the principal focus in this area and has developed more than 110 standards and updates. Twenty-six countries participate with another 24 as observers.

ISO/TC 31, *Tyres, rims and valves*, has developed some 75 standards and updates. Twenty-one countries participate with another 26 as observers.

The technical specification ISO/TS 16949 has become the global benchmark for quality management by automotive suppliers. Certification of conformity to ISO/TS 16949 is often required of suppliers by the automobile manufacturers as a condition to tender for participation in global supply chains.

The future ISO 39001, *Road traffic safety (RTS) management systems*, being developed by ISO project committee ISO/PC 241, *Road safety management*, is widely regarded as a major contribution to the United Nations' Decade of Action for Road Safety 2011-2020.

ISO standards now under development address alternative power systems promising less pollution and therefore contributing to the fight against climate change. These include standards for electrically propelled vehicles and vehicles powered by gaseous fuels, as well as for the infrastructures necessary to support them.

ISO & road vehicles, published in English and French, is available free of charge from the ISO Central Secretariat through the ISO Store (www.iso.org) or by contacting the Marketing, Communication & Information department (sales@iso.org). It can also be obtained from ISO national member institutes. The brochure can also be downloaded as a PDF file free of charge from the ISO Website. ■

Roger Frost is Head of Communication Services, ISO Central Secretariat.



Services

Few will not have noticed the marked and steady expansion of the services sector in recent years. Services of one form or another permeate every part of our lives – as consumer, as supplier, or both. The field is vast – from traditional sales-related services to intangibles such as banking, insurance and other financial services, not forgetting tourism, education, information, medical, public services. The list can go on and on.

Services represent the fastest growing sector of the global economy and account for two thirds of global output, one third of global employment and nearly 20% of global trade. With the increasing development of the sector has come a growing demand for standards to ensure quality and good practice in the supply of services. ISO has been highly active in this area.

International Standards defining requirements for many aspects of service quality already existed, notably within the generic ISO 9000 series of quality management standards. Alongside these, an array of standards addressing a multitude of specific services and service-related topics has been developed to meet market demand. Further, a number of the more recently created ISO technical committees have scopes of work which are specific to services, such as network services billing.

Service standards can help businesses gain essential competitive advantages, by creating transparency and enabling anyone wishing to use the services to carry out effective comparisons before making their choice. Other benefits include an improved quality of service across national borders, lowered costs and more time saved.

Standardization of services will have a lasting influence on the market as a whole, because it will encourage competition, protect consumer interests, aid economic growth and establish the conditions required for free and fair trade.

The March 2012 issue of *ISO Focus+* looks at the current developments in the international standardization of services and highlights the positive impact they will have, not only for specific services, but for the global market as a whole.

Articles cover a range of services, for which International Standards are being developed, such as the universal financial industry message scheme, mobile person-to-business payments, tourism and related services, network services billing. An article on ISO/IEC Guide 76:2008, *Development of service standards – Recommendations for addressing consumer issues*, for the development of service standards is also included.

You will find all these and more in the next issue of *ISO Focus+*. ■

ISO 50001 “on fire”

Since publication of ISO 50001 in June 2011, implementation of ISO's new energy management standard is gaining pace around the world. An estimated 80 organizations in 24 countries had already achieved certification for the standard in January 2012 and are reaping the benefits in increased energy efficiency, reduced costs and improved energy performance.

ISO 50001:2011, *Energy management systems – Requirements with guidance for use*, is a new voluntary International Standard that establishes a framework for large and small industrial plants and commercial, institutional and government facilities to improve the way they manage energy. Improved energy performance can provide rapid benefits for an organization by maximizing the use of its energy resources and energy-related assets, thus reducing both energy cost and consumption. ■



ISO Focus+

The electronic edition (PDF file) of *ISO Focus+* is accessible free of charge on the ISO Website www.iso.org/isofocus+. In addition, the entire collection of previous issues of *ISO Focus+* editions, plus *ISO Focus* (2004-2009), plus *ISO Management Systems* magazine (2001-2009) is also available free of charge as electronic files.



ISO Update

The *ISO Update*, a monthly supplement to *ISO Focus+* is available electronically (PDF) in both English www.iso.org/isoupdate and French www.iso.org/fr/isoupdate.



The ISO Update informs readers about the latest developments in the ISO world, including ISO member bodies' CEO and address changes, draft standards under circulation, as well as newly published, confirmed or withdrawn standards. It also includes a list of upcoming technical committee plenary meetings.





**Hard work
is one thing.
Exploitation
is another.**

ISO 26000, Guidance on social responsibility

The first link in a global supply chain may be a little guy carrying a heavy load. The difference between hard work and exploitation depends on criteria like adequate pay, working conditions, health and safety factors, and social protection. Labour practices comprise one of the seven core subjects of social responsibility defined in ISO 26000, along with 37 underlying



issues and seven overarching principles. All are based on consensus among 99 countries and 42 international organizations from both public and private sectors. People worldwide now demand that organizations behave in a socially responsible manner. ISO 26000 shows how – and the benefits of doing so. Link up now!

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