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Are SI Units changing?

Earlier this year, at a meeting in London, discussions began to reform the scientific basis of the SI units. If approved, the changes would involve redefining the seven SI base units in terms of fundamental physical constants or atomic properties.

Formal definitions of all SI base units are approved by the Conférence Générale des Poids et Mesures (CGPM). The first such definition was approved in 1889 and the most recent in 1983. These definitions are modified from time to time as techniques of measurement evolve and allow more accurate realisations of the base units. The Bureau International des Poids et Mesures (BIPM) operates under the exclusive supervision of the Comité International des Poids et Mesures (CIPM) which itself comes under the authority of the CGPM and reports to it on the work accomplished by the BIPM. The BIPM has its headquarters near Paris. The task of the BIPM is to ensure world-wide unification of physical measurements; its function is thus to:

- establish fundamental standards and scales for the measurement of the principal physical quantities and maintain the international prototypes
- carry out comparisons of national and international standards ensure the

coordination of corresponding measuring techniques

- carry out and coordinate measurements of the fundamental physical constants relevant to these activities.

The International System is based on a choice of seven well-defined units which by convention are regarded as dimensionally independent:

1. the metre
2. the kilogram
3. the second
4. the ampere
5. the kelvin
6. the mole
7. the candela.

These SI units are called *base units*.

Apart from the kilogram, these are referenced to fundamental constants or atomic properties. The kilogram is based on the International Prototype of the kilogram based in Paris – and there is a concern that it is changing over time. The proposed changes would remove these concerns over the stability of the kilogram. There are also other proposed changes to the Ampere, Kelvin and Mole.

The Table below shows the old and the proposed constants used for the base SI units.

Base Unit	Current Reference Constant	Proposed Reference Constant
s, second	Hyperfine splitting in Cs-133	Hyperfine splitting in Cs-133
m, metre	Speed of Light in a vacuum, <i>c</i>	Speed of Light in a vacuum, <i>c</i>
kg, Kilogram	Mass of the International Kilogram	Planck's constant, <i>h</i>
A, ampere	Permeability of free space μ_0	Elementary charge <i>e</i>
K, Kelvin	Triple point of water T_{tpw}	Boltzmann constant <i>k</i>
Mol, mole	Molar mass of carbon -12	Avogadro constant N_A
cd, candela	Luminous efficacy of a 540THz source	Luminous efficacy of a 540THz source

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Credit Rating Standard

A new technical standard has been released by ISO that offers a reliable approach to assessing the creditworthiness of companies. **ISO/TS 10674:2011, Rating services – Assessment of creditworthiness of non-listed entities**, provides common terms, definitions and basic process requirements for the assessment of creditworthiness. Dr. Olivier Everling, Chair of the project committee that developed ISO/TS 10674:2011, said, “In the aftermath of the financial crisis, rating agencies and credit bureaus needed to simplify and provide broader market access to rating criteria, underlying models and analytical tools, to better organize information about their criteria, models and policies, and to offer access to additional analytical tools. ISO/TS 10674:2011 is a bi-product of the financial crisis intended to promote transparency and enable the market to best judge the performance of the assessments. It will be an invaluable tool for promoting international trade by making it possible to obtain more reliable credit assessments of even the smaller partners in global markets.” Further information is available from www.iso.org

Standard for Conformity Assessment

ISO/IEC 17021:2011, Conformity assessment – Requirements for bodies providing audit and certification of management systems, has been released recently and aims to increase trust in certificates issued attesting conformity to management system standards. There is now a free tutorial on this edition and it is available on the ISO website at www.iso.org/tutorial17021. The tutorial explains the differences between the 2006 standard and the 2011 standard.

New Business Continuity Standard

The recently released standard on business continuity management processes aims to improve security measures taken against hacking, denial of

services and malware attacks. **ISO/IEC 27031:2011: Information technology – Security techniques – Guidelines for information and communication technology readiness for business continuity**, provides advice for all types of security-conscious organizations, regardless of their size, complexity and risks. The standard describes the principles and concepts of information and communication technologies (ICT). A framework is given on the methods and processes to identify and specify all aspects, including performance criteria and design.

Prof. Edward Humphreys, Convenor of the working group, which developed the ISO/IEC 27001 standard, comments: “The business environment is constantly changing – along with threats to a company’s survival. Organizations need to be ahead of the game, and an excellent defence can be built around risk-based information security management system (ISMS) founded on ISO/IEC 27001, together with business continuity management processes based on ISO/IEC 27031.” For more information, please visit www.iso.org

Red Tape Challenge Website

The UK government have launched a new website that invites members of the public, businesses and community organisations to have their say on regulations that affect their lives. The initiative is part of the Government’s growth agenda and aims to tackle the more than 21,000 statutory instruments that are barriers to business, volunteers and the public.

The Prime Minister said: “We need to tackle regulation with vigour, both to free businesses to compete and create jobs, and give people greater freedom and personal responsibility. Of course we need proper standards, for example in areas like fire safety and food safety. So where regulation is well-designed and proportionate, it should stay. But it is hard to believe that we need government regulations on issues such as ice cream van musical jingles. That’s why I want us to be the first government in modern history to leave office having reduced the overall burden of regulation, rather than increasing it. Our starting point is that a regulation should go or



its aim achieved in a different, non-government way, unless there is a clear and good justification for government being involved. Be in no doubt: all those unnecessary rules that place ridiculous burdens on our businesses and on society – they must go, once and for all." To have your say visit the Red Tape Challenge Website

<http://www.redtapechallenge.cabinetoffice.gov.uk/home/index/>

Protect your Innovations

Research carried out by the Intellectual Property Office (IPO) has shown that only 15% of small companies have asked for advice on how to safeguard their ideas and only 11% of small firms assign responsibility for managing intellectual property rights. Intellectual Property Minister Baroness Wilcox said: "Innovation is the backbone of our economy, and it's encouraging that many businesses know the importance of protecting and exploiting their ideas. However it's clear that many smaller companies aren't aware of how to make the most of their intellectual property. As part of the Government's commitment to helping small businesses, the Intellectual Property Office offers a range of information and services to help companies identify and benefit from their inventions and designs."

To assist companies, there is a range of support available from the Intellectual Property office, including:

- Free IP Healthcheck tool to help businesses understand different areas of IP.
- Workshops delivered throughout the UK to teach business advisors about IP.
- An IP Master Class course in partnership with Coventry University and the British Library.
- Free regional IP awareness seminars for businesses.
- Free guidance documents on a range of IP topics, from outlining the basics to country-specific IP guides for UK exporters to Brazil, China, Korea,

India and Vietnam to help British companies in the major markets around the world.

You can start your IP health check by visiting <http://www.ipo.gov.uk/whyuse/business/iphealthcheck.htm>

Public Available Specification for Managing Website Policies

PAS 124:2011 Defining, implementing and managing website policies and standards - Code of practice has been released recently. Website policies and standards should be part of a company's website governance programme and PAS 124 aims to assist this. According to BSI, the key benefits of adopting the PAS 124 approach include:

- Brand protection and reinforcement
- Optimised user experience
- Risk management
- Reduction in development and maintenance costs
- Faster time to market

For further information, please visit www.bsi-global.com

Climate Resilience Toolkit

A new interactive online tool produced by DEFRA and the Chartered Institute of Management Accountants (CIMA) has been released that aims to help businesses prepare for both climate risks and opportunities. Lord Henley, Environment Minister, said: "Climate change will have impacts on all UK businesses, such as the availability of resources, demand for different products, and the increased threat of floods, drought and other extreme weather. But smart businesses that take action now to limit the risks and identify the opportunities climate change could bring will steal a march on their rivals." "The Climate Resilience Toolkit we have developed with CIMA is an excellent tool for quickly and simply assessing areas in your business that could be affected by climate change." The Toolkit can be found at www.businesslink.gov.uk/climaterisk