française pour la gestion des déchets radioactifs «ADEME» aidera la Russie dans la création d'une organisation similaire.

Comme conclusion il faut noter qu'aujourd'hui le développement civilisationnel est impossible sans énergie. Le développement de la technologie et de l'industrie, la croissance de la population mondiale nécessitent une énergie énorme. Chaque pays y est impliqué. C'est dans ce but que la Russie et la France font des projets communs, améliorent l'efficacité énergetique, développent l'énergie nucléaire et sont à la recherche de nouvelles façons de développement des énergies alternatives.

REFERENCES

1. Ушаков В.Я. Современные проблемы электроэнергетики. – Томск: Изд-во ТПУ, 2013. – 193 с.

SMART SENSORS IN INDUSTRY

D. Kirilchik, G. Nizkodubov
Tomsk Polytechnic University

Sensor technologies are a rapidly growing area of interest in science and product design, embracing developments in electronics, photonics, mechanics, chemistry, and biology. Their presence is widespread in everyday life, where they are used to sense sound, movement, and optical or magnetic signals. The demand for portable and lightweight sensors is relentless in several industries, from consumer electronics to biomedical engineering to the military. Smart Sensors for Industrial Applications brings together the latest research in smart sensors technology and exposes the reader to myriad applications that this technology has enabled.

Sensors are absolutely essential in control and instrumentation, being the route through which processing electronics acquires information from the external world upon which they act. Neither instrumentation nor control systems have an existence unless measurements are made. There are wide ranges of measurands which are detected by a variety of sensors. The sensors have now become a key component in many areas, including automotive, medical, aerospace and industrial process control. A broad range of sensors is also required to provide automation in the manufacture of goods. These include some common sensors like 'tactile sensors' and 'pressure sensors' to detect the stress applied to the workpiece. One system could use many sensors to get an accurate reading of the system performance.

Smart sensors currently have established their strongest presence in the industrial market. Reasons which can readily be identified are: the higher cost associated with the more stringent specifications and medium to low volumes prevalent in the industrial market place the relative unimportance of package size the high level of importance attached to data reliability associated with very large plants and coupled with difficulty of access to sensors for diagnostics, and the development of a number of industrial digital databus standard. It is expected that the trend to introduce smart sensors in the industrial area will continue as databus standards are rationalized and the benefits of remote diagnostics are better understood.

The aerospace industry is looking to adopt smart sensors for different sensors. The issues of data integrity are equally important or more so, but another major concern is that of the weight of cable associated with large numbers of sensors which are frequently multiplicated for redundancy purposes. Safety is potentially improved by self-monitoring sensors, the additional information generated by this new capability requires a multiplexed, i.e. digital data bus to return the information to a point where it is of value and the availability of multiplexed data buses allows the output of many sensors to be concentrated onto the minimum number of buses consistent with adequate redundancy.

Automotive manufacturers are also closely monitoring the potential of smart sensors, but here the cost constraints are paramount. Smart sensors attached to digital buses are unlikely to find their way into the majority of vehicles until the data buses themselves are introduced for other purposes.

Communications between engine, transmission, suspension, braking and other controls has long been anticipated and a variety of automotive databus standards exist to enable this. Each automated process consists of different functional blocks. For example, to control the flight of an aeroplane, we need: actuators, such as engines and rudders to propel the plane; computers, such as the automatic pilot, to control the actuators on the basis of a flight plane; and sensors for measuring acceleration, altitude, tilt, etc., to feed the computer with information about the actual flight and to enable corrections to be made.

The existence of a processor within the package, however, opens up many more possibilities. The two most obvious of these are digital communication via a standard bus and sensor diagnostics. Others include improved response times based on prior knowledge of frequency characteristics and the ability to calculate a measurand on the basis of a variety of raw input data.

Smart cards are now increasingly popular in cellular systems, because these are used in an inexpensive way to enable e-commerce applications, additional security and roaming functions, without altering the basic design of terminals. Wireless internet and mobile e-commerce will boom soon, as network operators aggressively pursue the merits of integrating security and transaction applications on the WAP (Wireless Application Protocol) platform.

To sum up, the evolution and technology development of smart sensors for various applications in different fields have been discussed. Fabrication aspects of smart sensors have also been discussed. The latest trends including biochips have also been presented. Measurements and instrumentation systems will be developed by using smart sensor in future.

REFERENCES

1. Singh R., Singh V.R. IETE Tech Rev, 1993. – Vol. 10. – 557 p.
2. Singh K. Development of MEMS using ASE technique, presented at 24th Nat Symp on Instrumentation, Goa, India, Feb 2-6, (2000).

VIVID PECULIARITIES OF AMERICAN AND BRITISH PRONUNCIATION

V. Litvinenko, A. Obskov
Tomsk Polytechnic University

In phonetics and phonology, articulation is the movement of the tongue, lips, jaw, and other speech organs (the articulators) in order to make speech sounds.Sound is produced simply by expelling air from the lungs. However, to vary the sound quality in a way that can be useful for speaking, two speech organs normally need to come close to each other to contact each other, so as to create an obstruction that shapes the air in a particular fashion. The point of maximum obstruction is known as the place of articulation, and the way in which the obstruction is formed and released is known as the manner of articulation. For example, when making a p sound, the two lips come together tightly, blocking the air for a little while and causing a buildup of air pressure. The lips are then released suddenly, leading to a burst of sound. The place of articulation of this sound is therefore called bilabial, and the manner is called stop (also known as a plosive).

Pronunciation Differences of Vowels: