Integrating management systems? No problem for pioneering Poles!

Testing a set of roadway support components at GIG's Mechanical Devices Testing Laboratory.

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Poland's Central Mining Institute, credited with the foundation of the Polish mining industry of today and of many procedures adopted by mining industries around the world, owes much of its transformation into a flexible, modern, research and development organization to the implementation of an integrated ISO 9001, ISO 14001 and PN-N 18001 management system covering quality, environment and OH&S.

When an enterprise is successful in certifying to a management system standard such as ISO 9000 or ISO 14000, the achievement stimulates other organizations to do likewise. The same happens in Poland. Polish editions of these management system standards usually appear one to two years after publication of the International Standard. The ISO 9000 Forum Poland[1] has played an important role in encouraging implementation of these systems locally.

By end of the first quarter 2002, some 2 360 Polish enterprises had become PN ISO 9000-certified, 130 had achieved PN-EN ISO 14001 certification (the Polish adoptions of ISO 9000 and ISO 14001), and 17 had been certified to PN-N 18001:1999, the Polish edition of the (non-ISO) occupational health and safety management system standard.

Of these, 43 enterprises had achieved certification to both PN ISO 9000 and PN-EN ISO 14001, while 20 had implemented integrated management systems conforming to all three systems. The Central Mining Institute in Katowice, Poland, belongs to this last elite group.

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Activities of the Central Mining Institute

The Central Mining Institute (GIG) is a research organization linked since 1945 with the Upper Silesian region of Poland and its mining industry, including the experimental "Barbara" mine in Mikolów, established 20 years earlier. It is concerned with occupational safety, the development of mining technologies and techniques, and protection of the environment from the effects of industrial activity, particularly those relating to the mining sector. The work of the institute has provided the foundation of the safe, modern Polish mining industry, and, indeed, of many procedures adopted by mining industries around the world.

Headquarters of the Central Mining Institute (GIG), Katowice, Poland, member of an elite group of Polish organizations that operate integrated ISO 9000, ISO 14000 and PN-N 18001 management systems.

1) The ISO 9000 Forum Poland was established in 1991 as non-profit organization representing about 700 manufacturing, service and research organizations, and universities.

(Left) **A GIG technician at the Laboratory of Radiometry sets up a test to determine the concentration of natural radioactive isotopes in environmental samples.**

Restructuring and the application of up-to-date management and research methods over the past few years have transformed GIG into a modern research and development organization, able to adapt itself flexibly to the changing environment and to the growing requirements of its customers.

Currently the institute employs 578 people, including 12 professors and 95 doctors. Some 63 % of employees have received higher education. The organization comprises 24 research departments, a certification body and a training and information centre, as well as administration, financial and technical departments and teams.

GIG also offers comprehensive academic training courses in mining engineering and environmental engineering, and provides a number of services for all industrial sectors, state and local administration institutions and offices, and for foreign partners. The most important of these are:

- mining engineering
- environmental engineering
- assistance in PN ISO 9001, PN-EN ISO 14001 and PN-N 18001 implementation
- economic and social studies
- education and training
- certification and attestation.

About 80 % of the organization's income is derived from the commercialization of scientific research activities, such as projects won in tender, competitions, and services commissioned by domestic and foreign partners.

GIG's mission is "to create modern, energy-saving, safe and clean technologies, technical solutions and undertakings, and to foster positive relationships among people, industry and the environment". Human subjectivity is an essential element.

During 2001-2002, GIG participated actively in the Fifth and Sixth Framework Programmes of the European Union through involvement in joint projects with foreign partners. Poland's scheduled admission to the European Union in 2004 presents the institute with a great opportunity to become a centre of "Euro education" and establish itself in geo-engineering in the European Research Area. The institute aims to meet world standards for test equipment at its laboratories and for improvement in working conditions.

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Implementing modern management systems at GIG

Implementation of modern systems to manage quality, environment, occupational health and safety, human resources, finances and information processing can substantially improve management efficiency and overall competitiveness. With those aims in mind, GIG's Laboratory of Radiometry was the fifth research laboratory in Poland to

implement a quality assurance system according to PN-EN 45001, *General requirements for the competence of testing and calibration laboratories*, gaining certification from the Polish Centre for Testing and Certification (PCBC)[2] in 1993.

To date, 17 GIG research laboratories, whose work ranges from airborne dust monitoring to water and wastewater analyses, have been accredited by PCBC, and by Lloyd's Register Quality Assurance[3], the Central Office of Measures[4] and the Polish Shipping Register[5].

In 1996, GIG began implementation of a quality management system (QMS) in accordance with PN ISO 9001:1996, and was successfully certified by PCBC in November 1998. The next step was implementation of an environmental management system (EMS) and its integration with the existing QMS. In October 2000, PCBC certified that the integrated QMS and EMS was in conformance with PN ISO 9001:1996 and PN-EN ISO 14001:1998.

This integrated management system, which has been improved and developed since, and now includes occupational health and safety (PN-N 18001), was re-certified in March 2002 in conformity with all three standards. The resulting system also adopted elements of the Total Quality Management (TQM) approach which had been applied at the institute for many years.

GIG thus became the 20th Polish enterprise and the first research organization in the country to achieve the distinction of a triple-certified integrated management system. Its endeavours were first recognized in 1999 when the juries of the Silesian and Polish Quality Award competitions applauded the institute's management excellence, the latter being based on the European Quality Award Business Excellence mode. The organization went on to win second prize in the 2000 Polish Quality Award competition, and was also a prizewinner in the 2001 competition, in the large service enterprise (over 250 employees) category.

How the integrated system is structured

Systems integration was easily achieved since ISO 14001 shares common management system principles with ISO 9000, and because PN-N 18001:1999 is compatible with other management systems standards, and especially with ISO 14001.

The institute aims to meet world standards for test equipment at its laboratories and for improvement in working conditions

Top management played a crucial role in the implementation of each system by establishing a strategy, interpreted as a policy and translated into specific activities, and by providing human, financial and other resources needed to realize those activities. Continual improvement is the glue that links the systems, as a tool to meet quality, environmental and occupational health and safety objectives consistent with policy.

The next element, common to all three systems, was the application of a process approach to managing all organizational activities. Internal audits provide top management with information concerning nonconformances in the processes. These must be eliminated immediately, to make continual improvement possible. Documentation of each system needs the same control, as well as records created while the system is operating, and the same procedures are used to evaluate system effectiveness.

Our approach to employee awareness is the same. People need training to be aware of their contribution to the achievement of quality and envi-

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ronmental objectives, as well as those concerning occupational health and safety.

GIG's Integrated Management System Manual describes the structure and how it meets the requirements of the three standards. Common procedures are:

- establishing objectives and detailing programmes to achieve them,
- document and records control,
- identification of nonconformities,
- corrective and preventive action,
- internal audits,
- integrated management system reviews,
- communication,
- emergency preparedness and response to accidents, and
- training.

Elzbieta Gruszka, Director of Management Systems, who is also responsible for the effectiveness and continual improvement of the system, controls integrated system performance. In addition, the head of each GIG department has appointed a local management system representative whose main task is to oversee the departmental system operation. A management system team has also been appointed to play a substantial coordinating role in maintaining and improving the system.

Employees at GIG's Laboratory of Work Environment Studies and Air Protection measure total pollutant emissions from a new gas boiler at the Barbara Experimental Mine at Mikolów, Upper Silesia.

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Continual improvement is the glue that links the systems

Effective operation of the integrated management system ensures the development of the institute and the satisfaction of its employees and customers. Furthermore, it extends to protection of the environment and to reducing health and safety hazards.

Problems in system implementation

Although the very nature of the institute is one of a research and development organization, an early problem concerned acceptance of the manner of operation strictly defined

in procedures. The unified way of carrying out certain activities was considered by some employees to be contradictory to the principle that "scientific work needs freedom".

Technicians at GIG's Technical Acoustics Laboratory set up a vibrations test.

Other problems arose from the broad scope of GIG activities and its many processes. This was the reason that documentation was relatively extensive, requiring many records. It also takes considerable time to perform internal audits in all departments, since conformity to three standards must be established, and auditors are not released from parallel duties in their own departments.

Rapid system implementation, frequent document changes, as well as a substantial number of obligatory internal orders caused some problems when applying procedures.

During implementation of PN-EN ISO 14001, there were some difficulties concerning the requirement for pollution prevention. The mechanical and physical testing of rocks and solid industrial waste produces waste itself in the form of samples, or unused particles remaining after testing. Since the financial well being of a laboratory depends largely on the number of tests performed, reducing waste through fewer tests is contradictory to the interest of the laboratories and the institute as a whole. The solution was to reduce waste solely by reducing sample size, although not to the extent that it would affect the quality of the test result.

Most of these obstacles were eliminated gradually by simplification and reduction of documents and redundant forms during management system implementation.

Changing from paper to electronic documentation helped considerably and the amount of paper used diminished substantially. Since 2002, documents have been entered into the computer network, giving each employee free access. Microsoft Word file documents have been put into a database created via the Microsoft Access program, adapted to the institute's needs with future extensions possible. As a result, all document changes can be made much more easily and quickly in just a few minutes after approval. It is important to note that most internal regulations have been converted into procedures, substantially reducing the number of internal orders.

GIG's environmental performance has improved and there was not a single work-related accident during 2001

Audits, both internal and third party, are the most important means of improving the management system. In particular, remarks and observations made by auditors from the certification body gave us a critical external view of the system, and contributed to its performance improvement.

Benefits of the integrated system

We have seen both internal and external benefits resulting from the implementation of the integrated management system.

Internal benefits

Overall, implementation of the integrated system has substantially improved the process of management and even the most sceptical employees notice its positive effects. The quality awareness of employees has been growing, as is the importance they attach to meeting customer requirements. Similarly, they are more environmentally aware, and now understand the importance of conforming with procedures designed to protect the environment. Also the occupational health and safety management system, the most recently implemented, is seen by employees to be of direct benefit since it contributes to improved safety and working conditions.

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All the environmental aspects of GIG's activities have been identified, estimated and are being controlled. The same goes for health and safety hazards. Any emissions having an impact on the environment and on working conditions are being monitored, and procedures to reduce health hazards and the negative environmental impact of the institute have been implemented. Consequently, GIG's environmental performance has improved and there was not a single work-related accident during 2001. In addition, material and energy consumption has dropped.

Implementation of modern management methods has made it possible to identify any customer need regarding product quality. It also assures continual compliance with legal requirements concerning products, the environment and occupational health and safety. Now, top management has a process management tool that assures conformity to requirements and reduces environmental impact.

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External benefits

Implementation of the integrated system has helped raise the institute's competitiveness. And being the first Polish research organization to have been certified to the three standards is expected to prove particularly important in view of Poland's imminent admission to the European Union. The achievement increases GIG's credibility as an organization performing high quality research work, while improving work safety and its environmental performance. Furthermore, customer confidence has been enhanced, especially in those institute services that offer assistance in implementing management systems.

Further reduction in environmental impacts was achieved in 1999, when gas-fired boilers, substantially cutting pollutant emissions to the atmosphere, replaced coal-fired boilers at the Barbara Experimental Mine. Much of the waste generated by GIG is now reused thanks to installation of a separate waste collection system.

There have been economies as well. From October 1999 to December 2000, 15,15 tonnes of paper, 322,70 tonnes of steel scrap and 4,23 tonnes of aluminium scrap were collected and delivered to recycling, and another 3,65 tonnes of paper were recycled in 2001. The separate waste system also collects used printer and copier cartridges for reuse by Polish Humanitarian Action. Some 650 cartridges were collected in 2001, generating about 1 060 euros to help children in need within the "Jumping Jack" programme.

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Conclusion

There is little doubt that management system integration at the Polish Central Mining Institute has been an outstanding success. It serves as a tool for monitoring and controlling all processes, assures the high quality of services rendered, and helps reduce both the negative environmental impact of the institute's activities and the number of health hazards. Finally, the integrated management system has raised the effectiveness, competitiveness and credibility of the entire organization.

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