GIS-Based Knowledge Management and Decision Making Support

Kudrewicz, Rafal, Polish Oil and Gas Company, Geological Bureau Geonafta, Jagiellonska 76; 03-301 Warszawa; Poland *rafal.kudrewicz@pgnig.com.pl*

For three years, at the Geological Bureau Geonafta spatial data for oil and gas exploration in Poland have been collected. The data were digitized from paper copies, generated from field measurements and from results of interpretation works or purchased from third parties. The data are integrated in common geodetic system and numeric format, as well as truncated to the boundaries of the Republic of Poland. As a result of this standardization collected data build an integrated GIS system which is stored on the dedicated server, described in HTML-manual, and systematically maintained. The main idea of this activity is to get the quick access to the good quality and verified data for the employees of the company.

Data structure
The system contains data which describe several aspects of exploration activity such as:
- administration,
- concessionary processes,
- topography (towns, rivers, lakes etc.),
- facilities (roads, railways, pipelines etc.),
- areas of protected nature and landscape,
- land use,
- well locations,
- 2D and 3D seismic locations,
- oil and gas fields,

supported by:
- topographic base maps,
- geological maps, etc.

The data are stored in vector and raster formats. The system contains close to 100 vector coverages and more than 200 images. Analytical data which have discrete distribution (like wells, fields, facies maps etc.) are stored as vectors. The data with continuous distribution are stored as grids. The illustrative data such as calibrated scans of geological- or topographic base maps are stored as rasters. The base criterion based on which the data were classified into the analytical or illustrative groups, is the mode of use. The same criterion determines the ways of storage and accessibility. The

analytical data, which are mostly vectors, are stored on the server and are accessible in the *on-line* mode. The illustrative ones, which are mostly rasters, are stored on CDs and are accessible in the *off-line* mode. The information about data stored on CDs is available on the server and accessible *on-line*. Some data types e.g. well locations have links to the company data base that enables updates on request.

Geodetic system and integration
Because of Poland's complicated historical conditions in the last 100 years, the geological maps were produced basing on five or more geodetic reference systems. For GIS such situation is unacceptable. To construct coherent data set it was necessary to transfer the data to the common system. After experimenting with several systems the geodetic *phi-lambda* coordinates were chosen as reference system for the data storage. It is convenient and easy to recalculate to the other systems.

Numeric format
The data are stored in standard numeric formats and can be used for analyses made on laptop PCs as well as on UNIX machines without special transformations. The numeric data formats were chosen according to the hardware-software platform used within the company.

Profits
The system gets quick approach to the uniform, verified data. It allows integration of geological, environmental and cultural data, as well as creation of maps in many variants just on the screen. It supports preparation of exploration programs - gives the information about previous works, their results, quality, accuracy, source, its environmental and cultural conditions. It can help in elimination of conflicts between exploration and environment conservation activities. Preparation of official documents required by government and local authorities with application of the data stored in the system is much quicker and cheaper. The system has also some educational aspects. It can be helpful for new employed and people who enter new areas as well as for partners from other companies.

Development
To follow the criteria of high value of the data the system has to be developed and maintained. The existing data have to be upgraded and new data have to be added. In the future all data should be accessible in the *on-line* mode.

Acknowledgments