Database "catalogue of techniques applied to materials and products of nuclear engineering"

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Abstract. The database "Catalogue of techniques applied to materials and products of nuclear engineering" (IS MERI) was developed to provide informational support for SSC RF RIAR and other enterprises in scientific investigations. This database contains information on the techniques used at RF Minatom enterprises for reactor material properties investigation. The main purpose of this system consists in the assessment of the current status of the reactor material science experimental base for the further planning of experimental activities and methodical support improvement.

1. INTRODUCTION

A comprehensive approach to investigation of the performance of materials and products of nuclear engineering is applied at SSC RF RIAR. This approach includes the following:

- co-ordination of activities at their most expensive stages, i.e. irradiation and PIE with consideration of all operating Industry programs activities;
- discussion of the most significant and large-scope investigations with determination of the necessity of their development or improvement;
- solving problems of methodical support for investigations and development of the reactor material science experimental base.

This problem can be solved only with the complete information on the existing experimental base available, as well as by the provision of its prompt obtaining and usage. The establishment of computerized systems as data banks on methodical support for reactor materials science provides the process of decision making with the necessary and reliable information [1].

The database "Catalogue of techniques applied to materials and products of nuclear engineering" (IS MERI) was developed to provide informational support for SSC RF RIAR and other enterprises in scientific investigations [2]. This database contains information on the techniques used at RF Minatom enterprises for reactor material properties investigation.

The main purpose of this system consists in the assessment of the current status of the reactor material science experimental base for the further planning of experimental activities and methodical support improvement.

2. STAGES OF IS MERI DEVELOPMENT.

The development of IS MERI "Catalogue techniques applied to materials and products of nuclear engineering " consisted of the following stages:

(1) Application domain analysis, information composition determination, data structure development.
(2) Development of IS informational and linguistic support.
(3) Development of the software for input, editing, search and output of the information on the material testing techniques.
(4) Acquisition of the data on the available methodical developments at the Industry enterprises, systematization of the collected information, filling in the input forms.
(5) Input of the information into the database, debugging of edit, view, search, report generation and printout modes.

3. IS MERI DATA STRUCTURE

Fig.1 presents the IS MERI data structure which includes the following:

- The general information on the technique;
- Subject of the investigation;
- Investigated properties;
- Measured and calculated parameters, their ranges and errors;
- Used equipment, and
- Automation devices.

4. IS MERI SOFTWARE

A number of Windows applications were developed to provide the access to the database (DB) and to search for the information. These programs are used as a user's interface. The IS MERI Windows applications were designed in the integrated development environment (IDE) Delphi4, which allows for creation of the dialog operation mode with the database in terms of application domain objects. It also provides convenient, friendly, graphic interface. The applications were designed for Windows 95/98/NT with the usage of visual programming technology. The working language is Object Pascal 7.0.

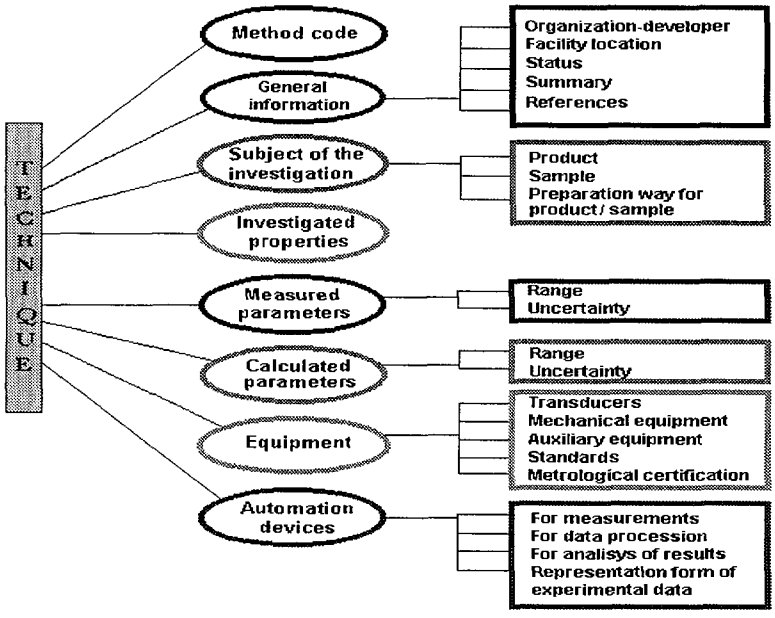

FIG. 1. IS MERI data structure.

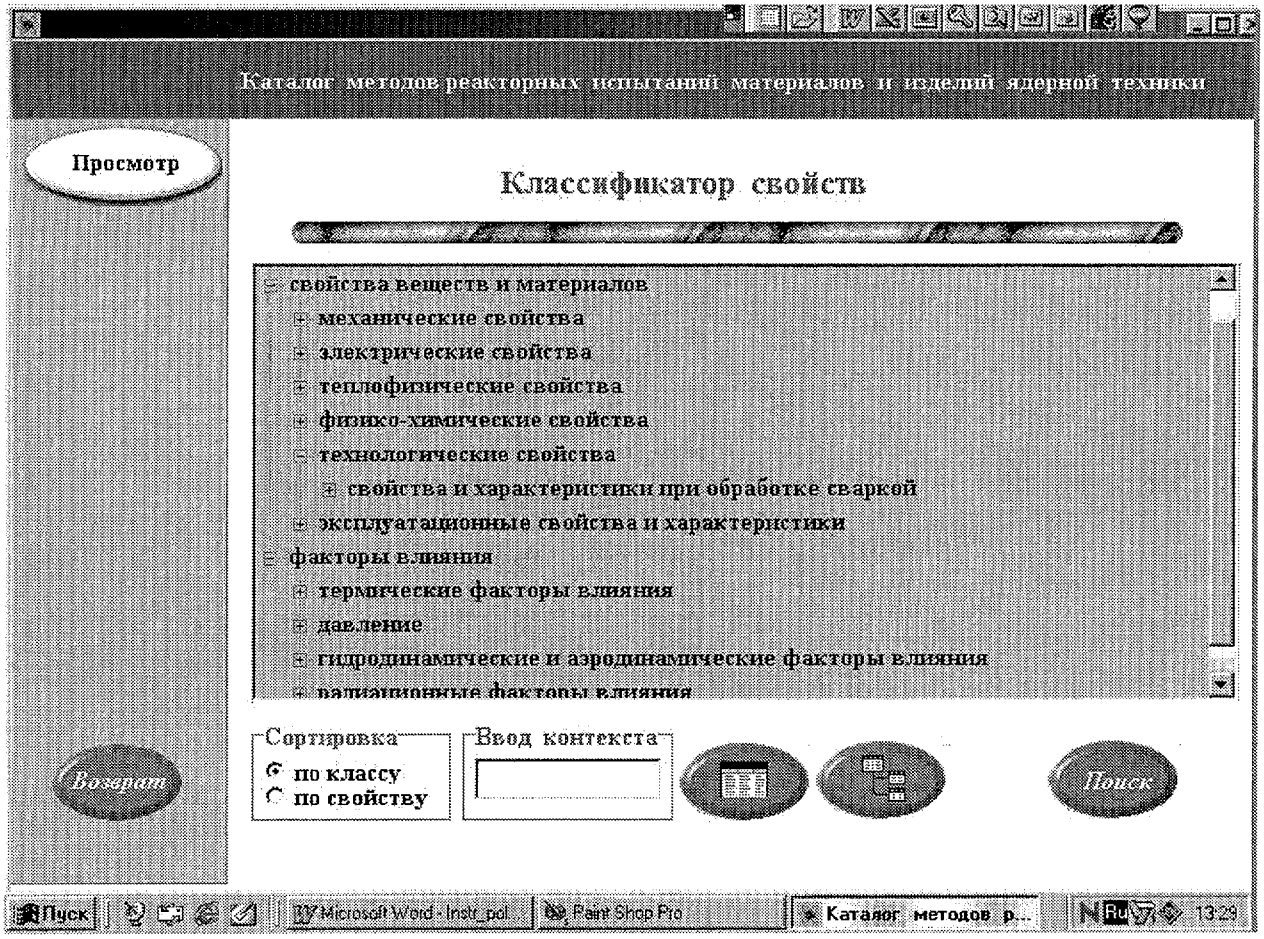

FIG. 2. The classifier of material properties.

5. USER'S INTERFACE

The system main menu gives the possibility to select one of the search directions based on: the number of the technique, organization, examined material, investigated property, and also on the selection of the parameters from the list (fig. 4).

The application composes a query to the DB, selects the information and outputs a list of techniques corresponding to the target search condition.

Depending on the target search condition of the query the user can obtain information on:

- All techniques developed and used at the given enterprise,
- Techniques used for investigation of the material specific property or the property class used at one or all Industry enterprises,
- Techniques used for the specific material examination at one or all Industry enterprises.

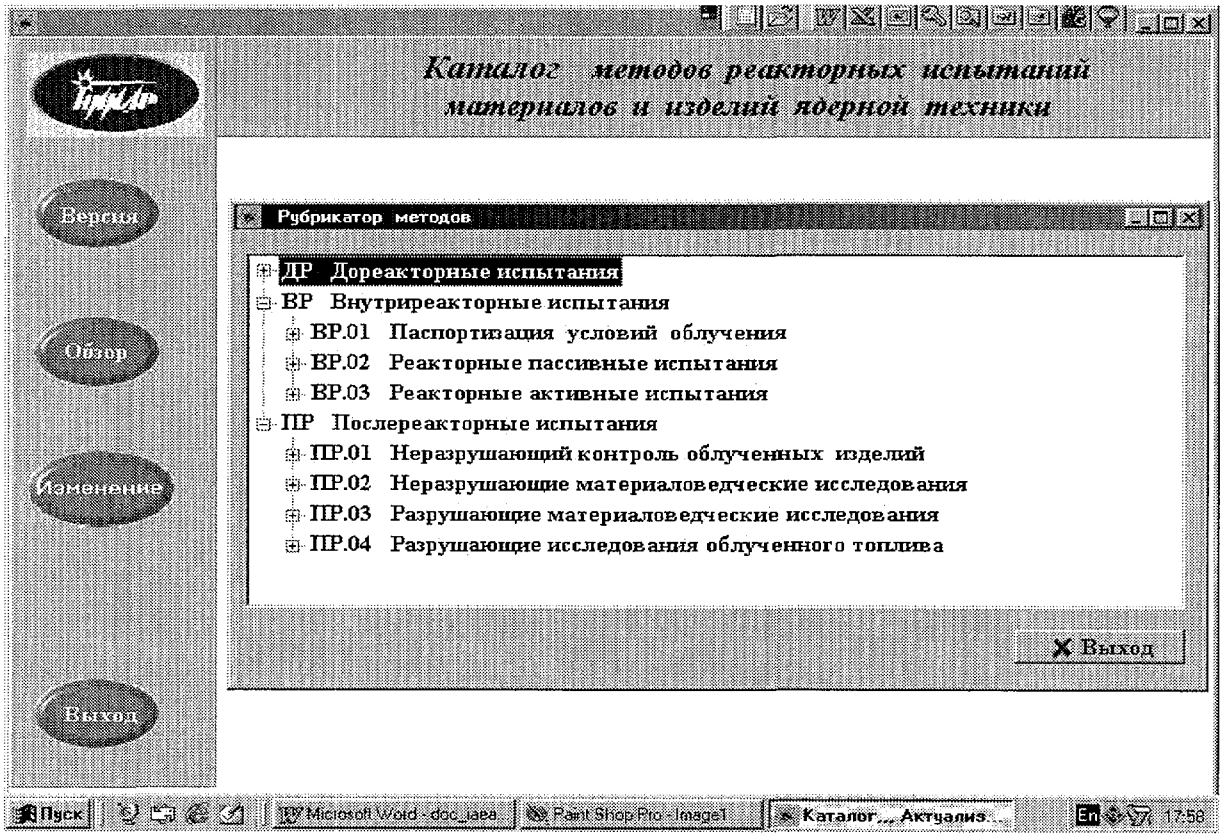

FIG. 3. The methods rubricator.

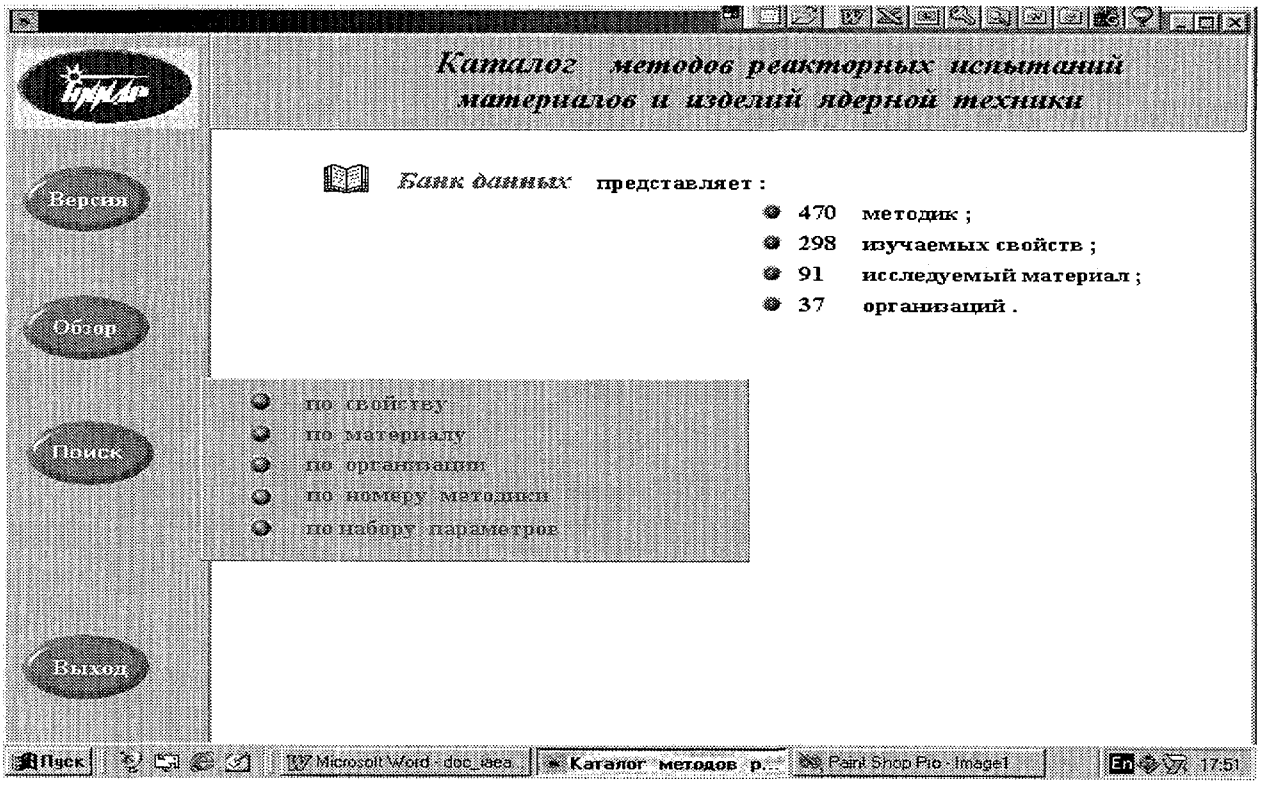

FIG. 4. IS MERI main menu.

Besides, the user is given an opportunity to search according to the arbitrary combination of parameters from the given list. The following technique attributes are presented in the list: the technique code according to the rubricator of the techniques, the organization — developer, the investigated material, the investigated property, reactor, current status, author.

The value of each search parameter is selected from the submitted lists and classifiers. The list/classifier unique for each parameter contains a full list of values of this parameter available in the DB and updated automatically. As a result a list of the technique numbers satisfying the search criterion is generated. Besides, the basic information on each technique and statistical information on the quantity of the techniques satisfying the query is displayed.

6. CONCLUSION

So, the informational system " Catalogue of techniques applied to materials and products of nuclear engineering" (IS MERI) was developed. This system is used for collection, systematisation, search and output of information on reactor examination techniques.

IS MERI allows for prompt obtaining of the information on:

- Materials properties testing techniques;
- Technique equipping and metrological certification;
- Uncertainty of separate testing techniques;
- Characteristics of facilities and devices;
- Used automation devices, etc.

At present IS MERI contains information on 404 reactor testing techniques developed in 17 Industry organizations, the number of investigated properties is about 300, the number of materials is 90. The total volume of the information is 7 Mbytes.

IS MERI was installed at DAE and leading enterprises and repeatedly used for analysis of the current status of the reactor material science experimental base, further experimental activities planning and methodical support improvement.

IS MERI is registered in the State Database Register of CRI ATOMINFORM and assigned No 0229804912.

REFERENCES

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