

DEVELOPMENT AND IMPLEMENTATION OF AN ADMINISTRATION SYSTEM FOR MAINTENANCE ACTIVITIES WITH A VIEW TO QUALITY ASSURANCE FOR ORGANIZATIONS

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Abstract:

ISOMENT is a dedicated software for administrative information administration and also for technical data referring to maintenance activities, according to ISO 9001:2000 standard. It represents an efficient instrument for quality management improvement in the organization. The application structures the administrative information and technical data referring to control, sizing and maintenance of measuring instruments using relational and SQL compatible database. From these can be obtained reports and synthesis with the role to give a general sight of pursuit and administration for measurement means concerning an organization, but also detail about each measurement instrument, therefore society clients will have the certainty that the products were verified using adequate and quality means.

Keywords:

measurement instruments , tracking, historical, measurement uncertainty

1. INTRODUCTION

In ensemble of necessary planed actions in order to provide the corresponding trust for a product or service that will satisfy the specified quality requirements, an important role has the product/service conformity verifying actions.

According with ISO 9001:2000 standard, the producer must establish and maintain documentary procedures for control, metrology and maintenance, measurement and testing (including the testing software) of inspection equipment that is used by the producer for demonstrate the conformity of product with the specified conditions. The usage of inspection, measurement and testing equipment has to be so that the measurement incertitude is known and compatible with the requested measurement capabilities. When the technical data disposability referring to inspection, measurement and testing equipment is a specified condition, this data must be available at the client or client representative request for verifying if the inspection, measurement and testing equipment are functionally adequate.

Since the size of inspection, measurement and testing data required in the ISO 9001:2000 attestation documentation is large and the data are preserved for a long time, there will be necessary the usage of automated processing means, especially if the type of processing information is statistical.

There is absolutely necessary to build a software system, in order to administrate the technical data and administrative information referring to control, sizing and maintenance of inspection, measuring and test equipment.

2. DESCRIPTION

The ISOMENT software system realized under Microsoft Visual FoxPro 6.0 software development environment (integrated development environment that includes visual designing instruments, oriented object programming instruments, client-server functionality and ActiveX objects support), organize the data manipulated of the application in a relational, SQL compatible, well structured database, offering a friendly access interface to the application functionality's and allows visualization and printing of complete, partial or synthesis image of data.

The data base security is protected by passwords, depending on the users' profile.

ISOMENT accomplishes the following functions:

- measurement instruments park administration
- maintenance and metrological operations administration
- address, documents, instrumentation personnel and family instruments administration
- synthesis development

2.1. Measurement instruments administration park

This administration allows a precisely review (inventory activities) for all measurement instruments from an organization, therefore measurement means tracking assurance:

- instruments and technical characteristics inventory
- instruments historical, using automatic taken information in accordance with a various valid events from ISOMENT
- automatic administration for operations date and periodicity interval

ISOMENT administrate each instrument individually, relying on the following information (managed through database tables):

general information:

- denomination
- family or type of instruments
- measurement type (pressure, temperature, a.s.o)
- date of reception and setting into operation
- concordance state
- available assets
- acquisition value

Figures 1-3 present screens from the friendly and suggestive user interface of ISOMENT .

The screenshot shows the ISOMENT software interface. The title bar reads 'ISOMENT'. Below it are menu items: 'Instrument', 'Operatii', 'Sinteze', 'Diverse', and 'Ajutor'. A toolbar contains icons for printing, search, navigation (back, forward), adding, deleting, and saving. A digital clock shows '13:08:59'. The main area has a 'Reper:' field with 'PT100' and a description field with 'Masurarea presiunii'. Below this is a tabbed interface with 'Diverse' selected. The 'Diverse' tab contains several fields: 'Data receptie:' (05/05/2001), 'Data punerii in functiune:' (06/06/2001), 'Tip sau fam. de instrumente:' (Instrument), 'Pret achizitie:' (6539750), 'Tipul masurarii:' (presiune), 'Conformitate metrologica:' (radio buttons for Conform, Neconform, Derogare), 'Stare de disponibilitate:' (radio buttons for In functiune, In stoc, In reparatie, Casat), and 'Bucla de masura:'. There are also checkboxes for 'Calitate', 'Securitate', and 'Mediu inconjurator'.

Fig. 1

information as regards instrument manufacturing:

- device serial number
- device trade mark and its references
- manufacturer or supplier

usage and placement information:

- company, function, person, production unit/subunit
- geographical placement and company owner name

The screenshot shows the ISOMENT software interface, similar to Fig. 1. The title bar reads 'ISOMENT'. Below it are menu items: 'Instrument', 'Operatii', 'Sinteze', 'Diverse', and 'Ajutor'. A toolbar contains icons for printing, search, navigation (back, forward), adding, deleting, and saving. A digital clock shows '15:01:17'. The main area has a 'Reper:' field with 'PT100' and a description field with 'Masurarea presiunii'. Below this is a tabbed interface with 'Diverse' selected. The 'Diverse' tab contains several dropdown menus: 'Soc. utilizatoare:' (SC IPA SA), 'Unitate de productie:' (Productie de vapori), 'Functie utilizator:' (Productie), 'Subunitate:', 'Nume utilizator:' (Popescu Ioan), 'Localizare geografica:' (Cluj-Napoca), and 'Societate proprietara:' (SC IPA SA).

Fig. 2

technical characteristics and observations recording the instrument

- a text area that allows writing free observations recording the instrument

theoretic metrological values of instrument

- caliber, input and output unit
- scale that contains minimum and maximum values
- error correction parameter, incertitude
- theoretic values table with all verifying, calibration and adjustment points

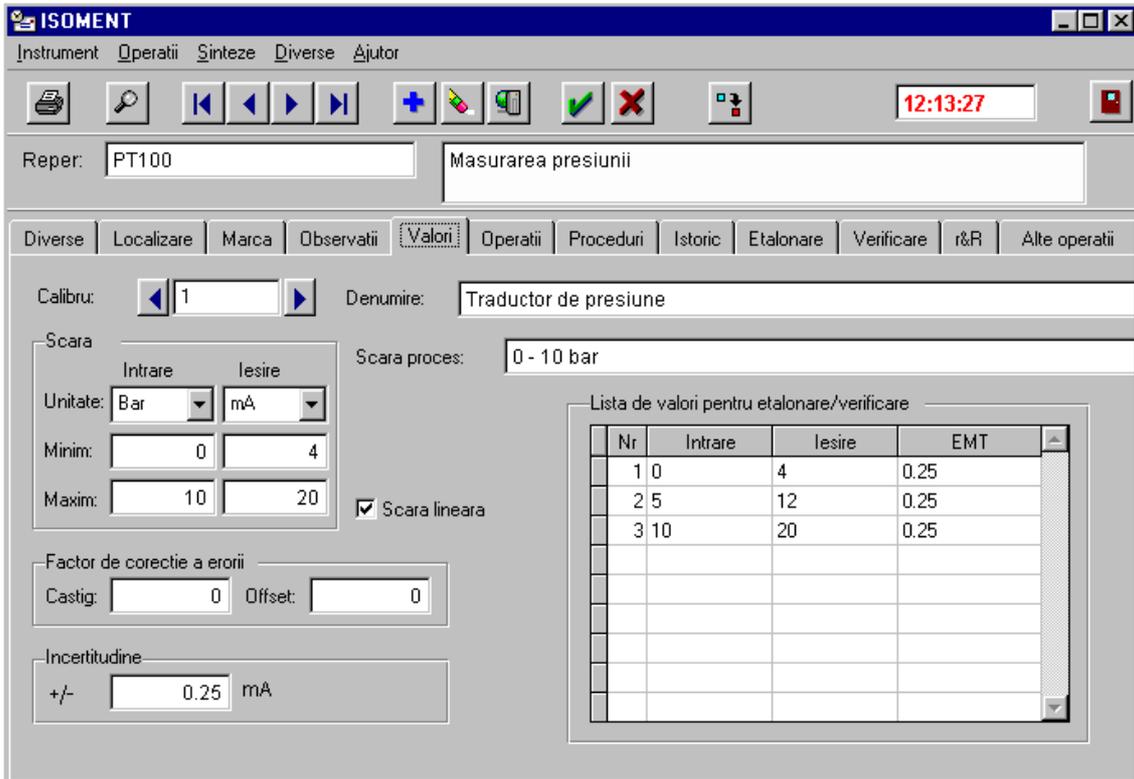


Fig. 3

information about periodic operations

- periodicity or time interval (in days) between operations that have the same type
- notice - which is the period of time (in days) when the call of an instrument will be made before the limit date of the next operation.
- date of last operation performed
- limit date for the next operation to perform

2.2. Metrological and maintenance operations administration

ISOMENT permits administration of data referring to:

- metrological and maintenance operations that have been performed
- metrological conformity and instrument available asset state

When is created a metrological operation (calibration, verification), or other operation, all of the administrative information and technical data necessary for tracking assurance are required or automatic undertaken by ISOMENT and stocked in *calibration, verification and other operation files*.

The signature of an operation activate automatic completion of the historical and initialize data for metrological confirmation period and also for the change of metrological conformity state.

Each *calibration file* contains the following information :

- caliber for calibration instrument
- the list of measurements that will be performed
- unit names that are used in the input and output measurements
- the involved personnel
- the list of used procedures
- a file for notes (observations)

The *verifying files* contain the same information as the calibration ones, plus :

- two series of measurements (before and after adjustment)
- the result of verification
- the decision that will be made recording to verification result
- details concerning the result
- the curves before and after adjustment

The *other operation files* contain information regarding:

- the personnel that is involved in operation
- the list of used procedures
- file reserved for notes (observations)
- the predicted and accomplished actions

On request, ISOMENT allows performing of error, incertitude and correction parameters instrument applied calculation.

2.3. Address, documents, instrumentation personnel and family instruments administration

ISOMENT allows creation and administration for information referring to:

participant companies address :

- name, address
- telephone and fax number, e-mail

documents (that can be created, administrated by ISOMENT and then reattached for each instrument):

- document name
- revision number, revision data
- type of document (adjustment/regulation procedure, calibration procedure, verifying procedure, maintenance procedure, structure documents, operator modes, a.s.o.)

instrumentation personnel:

- first and last name
- function
- various personal information

instrument family:

- name
- associated operations
- price of operations

2.4. Creation of synthesis

The application will accomplish a series of synthesis, as reports that will allow an easy administration for the metrological operations in the factory:

- individual or general planning (annual, monthly, weekly) for periodical operations
- notice (operator alarming referring to remaining operations, or the setting day for operations performing)
- measurements instruments selection trough establishing criterions and creation of lists that contain the instruments resulted after the selection
- record cards of the measurement instrumentation
- history of events encountered for any instrument, (contains actions according with certain events: change of availability , metrological state, calibration, verification, repairing, other operations)
- remaining operations evidence and validity of performed operations

2.5. Miscellaneous

ISOMENT uses all the Windows utilities, enabling: insertion of OLE objects (text, images) created with other applications under Windows operating system.

ISOMET has also a system of indications and information (Help) for all the commands and operations that are offered.

The required configuration for the application is:

Microprocessor: Pentium
Memory: min. 32 Mbytes
Operating system : Microsoft Windows '98

3. CONCLUSIONS

The implementation of administration software system and technical data referring to maintenance activities allows the endowment of users (metrological laboratories, service, repairing and regulation of mechanic, energetic and automation installations departments, quality assurance service), being an efficient tracking instrument for activities quality, with the view of ISO 9001:2000 certifying and for assurance of romanian merchandise penetration on external market.

4. REFERENCES

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