MODELS FOR DESIGN OF ENERGY POWER PLANTS ASSISTED BY NEUROEXPERT INFORMATION SYSTEMS

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Abstract:
In this article we present the innovative trends of the design of energy objectives that will farm the dynamic structure of the National Power System, emphasizing the following: Resorting to the design of energy objectives regarded under the sustainable development assisted by expert and neuroexpert systems; Orienting the development projects of the national power system to observing the principles of innovative sustainable development; Presenting in a synthesis the models and methods of sustainable development in the new structure of operational research; Proposal for a new neuroexpert design enabling the improvement of the traditional design solution based on evolutionary calculation; Drawing the essential content of the - Project Management - to be completed by a new material on how to design and carry out the revenue and expenditure budget as possible to apply in the new activity renewed at the Institute for Studies and Research – ISPE

Key words: dynamic structure, sustainability, neuroexpert design

1. FORMULATING THE PROBLEM REGARDING THE SUSTAINABLE DEVELOPMENT OF THE DESIGN OF ENERGY OBJECTIVES

The appeal of the design of energy objectives to the concept of the sustainable development of power systems is dictated by the pressure of the phenomena of globalization, integration and acceleration in all the aspects of change, which requires the inclusion of the creative design activities into the coordinates of the innovative performance management (participatory, predicting, computational, entropy and profit generating) in order to support the processes of sustainable development holistically connected to the design-production and profitable sale of power at the level of the competitive market if the archemo-systemic approaches of the value entrepreneur are able to create an appropriate development for the evolution that respects the principles of energy reengineering.

The sustainable development of energy facilities design requires the implementation in the relevant sections of the specialized institutes of project management applied in the converged engineering. Along this new orientation we may develop projects that use resources rationally and to provide profitable targets to energy specialists in the entire energy business within the design - production - energy market chain.

Following this outlook we will address in this paper the principles, methods, models and approaches that reorientate innovation, the design of energy objectives in the concept of sustainable development models assisted by the models of the research of actual facts holistically connected.

2. SUSTAINABLE DEVELOPMENT PRINCIPLES AND METHODS

The principles of sustainable development work on the background of running the power and material flows inside the computer assisted agile systems that are subject to restructuring processes in order to increase efficiency, decrease specific consumption, reduce information entropy, and improve the human quality and securing the quality of all the processes to reduce the total costs and exceed without risks the competition within the market.

The content of the principles of sustainable development can be expressed as follows:

P1 On the circuit of all resources (mineral, biological, information, energy, etc) there should not register systematic accumulations and significant variations.

P2 The energy and material flows circulating between sources and consumers should be optimized and must be used rationally at all operational levels.

P3 Investment strategies should ensure optimal matching between supply and demand with the aim of efficiently valorizing the available energy and to specify which services lead to a higher quality of human action.

P4 The decisions in an uncertain universe must be made with quantic and superquantic models equipped with the latest and best knowledge. The elaboration and implementation of decisions will take place where real events are held.

P5 Linking the technical -economic aspects and the managerial -financial ones should be reflected in rational holistic costs resulting from explorative and normative forecasting.

P6 The computer assisted logistics of companies should be developed around the goals and not around the products.

Applying these principles in the design and operation of energy objectives allows the company to develop sustainable competitive business based on the level of the knowledge of managers and professionals in continuous improvement through intensive learning and the the valorization of the results dictated by Benkmarking.

The complex methods of sustainable development refer to the practical realization of the following steps:

M1 Offering suitable products and services at appropriate times and locations at minimum competitive costs, which is an effective response of the designer to the consumer.

M2 The use of the information technology with emphasis on the engineering of creative software worthy for the customer. In this acceptance it is necessary to promote an intelligent project management to promote quality- cost correlations and allows managers to find the way to performance.

M3 The extensive and normative approach of power systems forecast that will operate the new efficient energy objectives of high power (500÷1000) MW. The improvement of the determined solution to minimize the total updated costs can be updated using evolutionary algorithms in the genetic variant.

M4 The anticipatory quantification of holistic risks must be conducted starting from the operators of the research of real facts, namely: the risk of sustainable development, the economic and financial risk, the technological risk, the risk of lack of quality of the energy products and processes, the risk of poor training of the human resource decisions and the risk of taking the wrong decisions by managers with a weak entrepreneurial culture.

M5 Implementing an environmental management system leading to the mitigation of the physical and intellectual pollution, made possible by the technology used by the professionals involved in each operational project.

M6 The engineering and analysis of the value create the basis for a competitive strategy based entrepreneurial firms. The value engineering is used to create value in design and cost analysis is recommended for the energy objectives operation. Increased value of product quality in design should be consistent with the methods used in the operation of energy objectives in different regions of the world. In this approach should be known and applied in practice the steps of energy reengineering such as Benchmarking, Sowt and the analysis of actual costs determined by the traditional methodology and that based on operational research.

M7 The reengineering of intelligence and the performance management have emerged as a necessity of training the energy projects managers and operators endowed with the specific sense of anticipating the future considering a quick action likely to reduce the holistic risks. In this approach we aim to train a new generation of leaders who know and apply project management in a profitable way.

M8 The management of the continuous trainers of the designers and project managers through intensive learning systems. In this way the new skilled generation of specialists is formed with a new conception of work, the creators of values, visionary, rapidly adaptable to changing competitive market. These specialists should be trained on the concept of neurogenetic growth of the quality of the human factor.

M9 The knowledge management involves the development of information technologies and claims awareness within the human resource of a new attitude to work arising from the wisdom - knowledge is power. Practically, the management of the company must develop the organizational culture based on the entrepreneurial thinking.

M10 The innovative logistics of productivity growth and profit requires the application of ergonomy and the motivation of labor that will not lack stress management.

3. SUSTAINABLE DEVELOPMENT MO-DELS AND OBJECTIVES

Starting from the characteristics of sustainability we can sketch models of sustainable development so that we should attain the innovation of the approaches to energy objectives in the long run. The definitions and objectives of sustainable development are as follows:

- Sustainability is defined as the capacity of systems to grow without risk to the desired targets of creators managers.

- The archemo-systemic concept specifies why and how we should correlate the quantitative aspects with the quality ones (archemic).

- The control of the accumulations and fluctuations of resources must be done in the holistic concept (considering all the factors that influence the source-consumer relationship).

- Optimizing the correlation between demand and supply in order to increase available power efficiency should be achieved over the entire biological circuit.

- Establishing holistic decisions and implement them both at investment level and at the level of energy objectives operation becomes an archemic priority.

- Reflecting the costs of all activities leads to the adoption of adequate solutions appropriate for the economic and financial goals.

- Sustainable development objectives are: economic aimed at maximum efficiency at the level of the results, social regarding the fair allocation of resources and ecological services in order to adapt the biosphere to the optimal geoclimatic conditions in order to carry out the allocation of resources of all kinds to the consumer requirements imposed, the establishment of demographic growth and the promotion of renewable resources.

Applying sustainable development to the agile systems is aimed at the changes at the level of the population, economic progress, the constraints on available resources, the increase in product quality, including processes agile, pollution mitigation and to

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determine the solution to cover the capital requirements. The aim of these approaches seeks to eradicate poverty, reduce income differences between people who work, increased insurance with products to the population, improving the efficiency of supply and the use of all resources including pollution mitigation.

Modeling the structure and functionality of the energy objectives at the level of design and operation is aimed to reduce the consumption of resources for the current generation needs without ignoring the opportunities that the future generations meet their needs and fulfill aspirations. The sustainable development of agile objectives through the holistic design and operation seeks the fulfillment of the policy of companies involved so that the knowledge and resolving the technological-economic changes and the managerial-financial one should ensure a bright future both for the customers as business partners and for the society investigated as a whole rapidly developing.

Building the models to optimize the agile objectives subject to sustainable development should focus on the knowledge of the realities dictated by consumers that are quantifiable restrictions by operational research. The essential aspects noteworthy to entrepreneurs managers are mainly the following: responding effectively to the consumer as formulated and implemented by each contractor (supply of products with affordable costs to be delivered at the suitable place and time), the intensive use of information technology based on intelligent knowledge management, the preparation and application of explorative and normative forecast, quantifying risk and transforming damage into resource saving, implementing an effective system of depolluting the environment, the design and application of value engineering, practical application of converged engineering (eliminating design and realization of goals set and the introduction of work in parallel), expert systems extending to all of real activities, making use of the intelligence reengineering modalities and performance management in order to form the new generation of entrepreneurs.

The mathematical structure of optimization models based on the operational research is as follows:

$$C_{tac}^{cop} = \sum_{i=1}^{dv} (1 - r_a)^{-i} \big[(C_{DD} + C_{CC} + C_{PR} + C_{RU} + C_{EF} + C_{DC})_i + (c_p R_{tt}) \big]$$

$R_{tt} = [R_{DD} + R_{CC} + R_{PP} + R_{RU} + R_{EF} + R_{DC}]$;

$c_p = [(0 \div 1]$

$C_{DD} = [C_{ci} + C_{pr} + C_{rs} + C_{cs} + C_{hs}] + c_p [R_{ci} + R_{pr} + R_{rs} + R_{cs} + R_{hs}]$; (2-1)

$C_{CC} = [C_{ame} + C_{cte} + C_{spc}] + c_p [R_{ame} + R_{cte} + R_{spc}]$;

$C_{PR} = [C_{ren} + C_{reg} + C_{cal}] + c_p [R_{ren} + R_{reg} + R_{cal}]$;

$C_{RU} = [C_{eer} + C_{ppe} + C_{doc} + C_{hm}] + c_p [R_{eer} + R_{ppl} + R_{doc} + R_{ln}]$;

$C_{EF} = [C_{ff} + C_{pp} + C_{sb}] + c_p [R_{ff} + R_{pp} + R_{sb}]$;

$C_{DC} = [C_{cd} + C_{fm} + C_{dc}] + c_p [R_{cd} + R_{fm} + R_{de}]$;

$C_{tan} = [k_i I_i + [e_i E_p] = [k_i i_{sp} + p_{ei} t_f] P_i$

The production costs and rates have the following mathematical structures:

$$C_p = \frac{k_{ee} C_{tac}^{cop}}{g_i E_p \cdot d_v} [\text{lei / product}]; \qquad (2\text{-}2)$$

$$t_p = \left[C_{sp}^p + t_{tax}^{network} + t_{\substack{distributi\,on \\ tax}}^{sup\,ply} + t_{\substack{conecting \\ tax}}^{market} + p_{profit} \right]$$

[lei/product]

Where:

C_{tac}^{cop} = total current operațional research costs

$r_a = r_{interest} + r_{inflation} + r_{risk}$ = discount rate

dv = the lifetime of the designed and operated energy objective

C_{DD} = costs of energy objectives development consisting of the efforts designed to search information (C_{CI}), those necessary to achieve the forecasts (C_{PR}), to cover the risks (C_{rs}), a disaster (C_{CS}) and to prevent chaos (C_{hs})

C_{CC} = expenses for the acquisition of materials and energy (C_{ame}), to increase the useful working time (C_{cte}) and to study the competitive market (C_{spc}).

C_{PR} = costs of production consisting of the economic efforts destined to the renewal of equipment (C_{ren}) to ensure the economic regime of the operation of the aggregate (C_{reg}), raising the quality of all activities (C_{cal}).

C_{RU} = expenses on human resource reconfiguration destined to increase empathy and the ergonomy of human resources (C_{eer}), those for the design of work posts (C_{ppl}), those required for the development of information dialogue (C_{doc}) and those required to increase labor productivity (C_{hm}).

C_{EF} = expenses destined to cover the economic and financial activities for funds formation (C_{ff}), and to design pricing (C_{PP}), and the financial efforts for the development of birotics strategy (C_{sb}).

C_{DC} = expenses destined to the decisions and Communications at the level of the company consisting of funds for managers training (C_{fm}), those for making decisions (C_{cd}) and those for the development of Communications (C_{DC})

c_p = total restrictions penalty coefficient (R_{DD}...R_{DC}).

C_{tan} = annual costs consisting of depreciation ($k_i l_i$); k_i = depreciation quota; I_i = the total investment and the efforts necessary to operate energy objectives ($P_{ei} E_p$) P_{ei} = price of energy, E_p = power produced, i_{sp} = specific investment, t_r = operating time of the systems, P_i = newly installed power.

$g_i = (0.8 \div 0.9)$ the loading of aggregates, C_{sp} = specific cost of product.

t_{ee} and t_{et} = electric power tariffs (ee) and the thermal power (et) provided to consumers

K_{ee}; k_{et}, = keys to annual cost share on energy produced

($K_{ee} = 0.6$; $k_{et} = 0.4$).

The penalty coefficient is zero if the cost analysis took into account the influence of any restrictions. Otherwise ($c_p = 1$) if you have not taken into account at the end the functional tehnological restrictions. In the latter case the total cost on operational research is doubled.

The design operations of the agile objectives and the mounting ones will be done in applying these new guidelines on project management.

4. INFORMATICS OF THE SUSTAINABLE DEVELOPMENT OF ENERGY OBJEC-TIVES DESIGN AND OPERATION

The efficient informatics of sustainable development of the design and operation of energy objectives should be based on the structure and functionality of expert and neuroexpert systems whose operational models and schemes are presented in this innovative material. Expert systems are specialized program products capable of real-time supervision of a given activity by using a knowledge base and operational models presented in Figures (4-1) (4-2). The functions and applications of expert systems can be followed in Tables (4-1), (4-2) and (4-3).

Depending on the interaction modes between the decision maker and the system are used expert structures resorting to programs with flexible language (closer to natural language) and those that work with specific commands. Depending on applicability and destination we distinguish expert systems synthetically presented in Figure (4-3).

The mathematical models for solving real problems by expert systems are presented in relations (4-1) and (4-2).

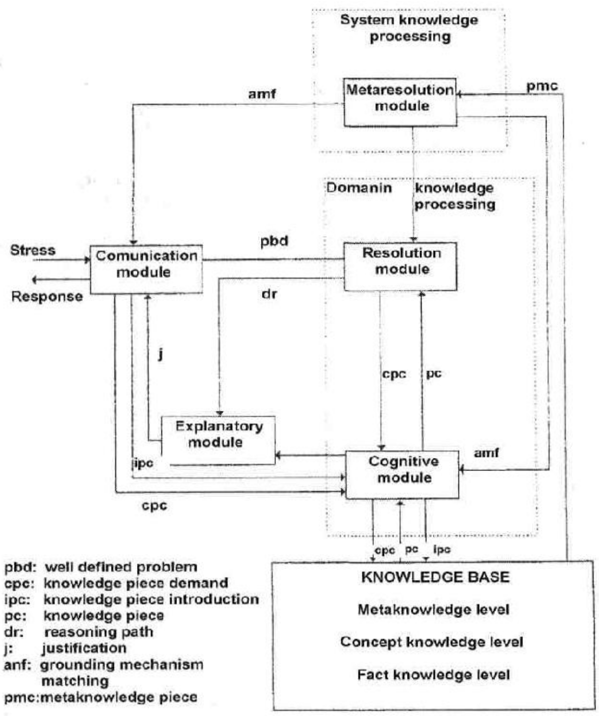

Fig. 4-1 Fundamental circuit of expert systems

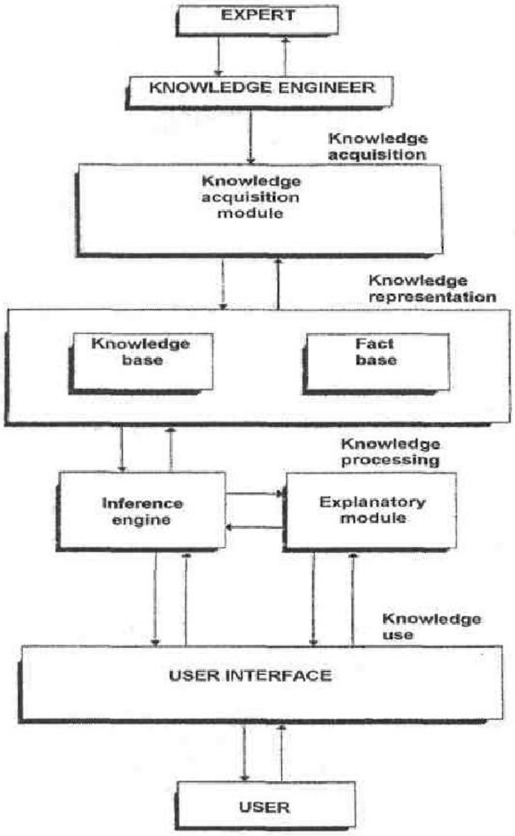

Fig. 4-2 Expert system architecture

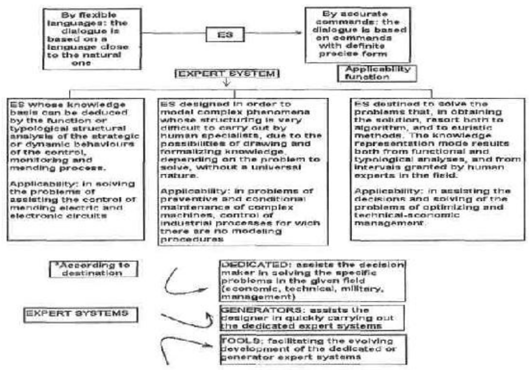

Fig. 4-3 Functional structure of expert systems

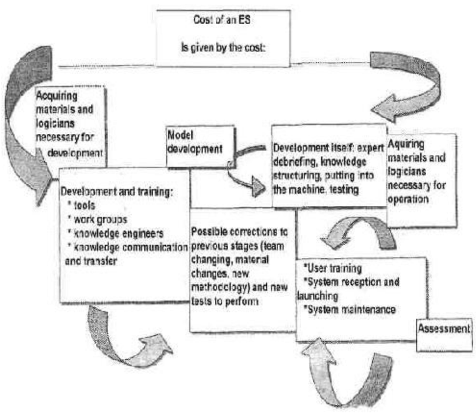

Fig. 4-4 System structure cost

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Table 4-1

Functions computerizable by expert systems	
FUNCTION	**SPECIFICATION**
Control and monitoring	System intelligent control (automatic)
Fixing and reparing	Recommends corrections of system operation deficiencies
Design	Product and system design
Diagnosis and maintenance	Locates operation errors and recommends necessary corrections
Training	Improving learners' performance by using CAI (Computer Asisted Instruction) strategies. Intelligent tutors
Interpretation	Calrification of certain situations, inference of significance of new situations based on signals from sensors
Planning	Develops goal oriented activity design
Prediction	Inference of probable situations based on already known information
Sentence	Sentence process and rule sysrem and procedures used in sentences: Deduction, Induction, Abduction
Simulation	Deducting consequences or events triggered by the system itself
Simulation (taxonomy)	Organizing entities (objectives) by classes/ categories
Selection	Identifying the best alternatives in a list of possibilities

Table 4-2

EXPERT SYSTEMS APPLICATIONS
1. Diagnosis of installations
2. Monitoring activities
3. Programming, surveying and analysing decision making
4. Management assistance to achieve designed quality
5. Determining in real time the supplier – consumer behaviour
6. Setting the development strategy
7. Monitored rational operation of installations
8. Personnel training
9. Building the decision sequence ensuring the attaining of the efficient parameters at the level of the monitored functions

Neuroexpert systems are software in which work the architectural modules in Figure (4-2) with neural networks that correct archemically the solution given by the expert structures (Fig. 4-1). The current configuration of the neuroexpert systems can be followed in Figure (4-5).

The structure models of the functionality of neuroexpert systems that will work as operational levels of the human brain have the following structure mathematically relevant:

a) Quantic decision models (Md_c)

$$Md_c = \left[M_{\substack{\text{internal}\\ \text{creation}\\ \text{model}}} + M_{\substack{\text{internal external}\\ \text{interface working}\\ \text{model}}} + M_{\substack{\text{external}\\ \text{model}}} \right]$$

$$M_{\substack{\text{internal}\\ \text{creation model}}} = \left[M_{\substack{\text{hereditary}\\ \text{model}}} + M_{\substack{\text{genetic algoritm}\\ \text{model}}} \right] =$$

$$= \left[M_{n1} + M_{n2} + M_{n3} + M_{n4} + M_{n5} + M_{n6} + M_{n7} \right]$$

$$M_{\substack{\text{working}\\ \text{model}}} = \left[M_{\substack{\text{own learing}\\ \text{model}}} + M_{\substack{\text{model of learning}\\ \text{from examples}}} \right]$$

$$M_{\substack{\text{external}\\ \text{model}}} = \left[M_{\substack{\text{interface}\\ \text{decizion model}}} + M_{\substack{\text{superquantic}\\ \text{model}}} \right]$$

$$M_{\substack{\text{hereditary}\\ \text{model}}} = \left[M_{\substack{\text{vigility}\\ \text{relation model}}} + M_{\substack{\text{dataprocessing}\\ \text{and storage}}} + M_{\substack{\text{psyhic control}\\ \text{and relying model}}} \right]$$

$$M_{\substack{\text{quality}\\ \text{model}\\ \text{based on}\\ \text{genetic algorithms}}} = \left\{ f(x) + \sum_{i=1}^{m} [g_i(x)]^2 + \sum_{j=1}^{n} [t(h_i(x))]^2 \right\}$$

M_{n1} = the neuronal logistic model (biophase-biophysical) based on the archemic function of the genetical by selected chromosomes
M_{n2} = the model of model neuronal synaptic funcțional circuits
M_{n3} = the tehnological-functional model of the efficient neuronal network
M_{n4} = the structural model of the logistics not reflected which escapes conscious control
M_{n5} = the model for the detection of the solution to the verbalization filter transferring action towards the logical reflected operations
M_{n6} = the model for achieving the interpersonal communication through neosphere
M_{n7} = the final model in noosphere (noogenesis) that enables the formation of the level of human knowledge generating innovation.

b) Superquantic decision models (Md_{sc})

Mode of maximum vulnerability occurrence probability

$$M_{p\max}^{Laplace} = \max \left| \sum_{j=1}^{n} \frac{p_{ij}}{n_{ij}} \right| = \max \left| \sum_{j=1}^{n} \frac{V_{ij} - C_{ij}}{n_{ij}} \right|$$

Where: p_{ij} = operațional matrix profit
n_{ij} = analysed superquantic solution variants
v_{ij} = total income
C_{ij} = involved total cost

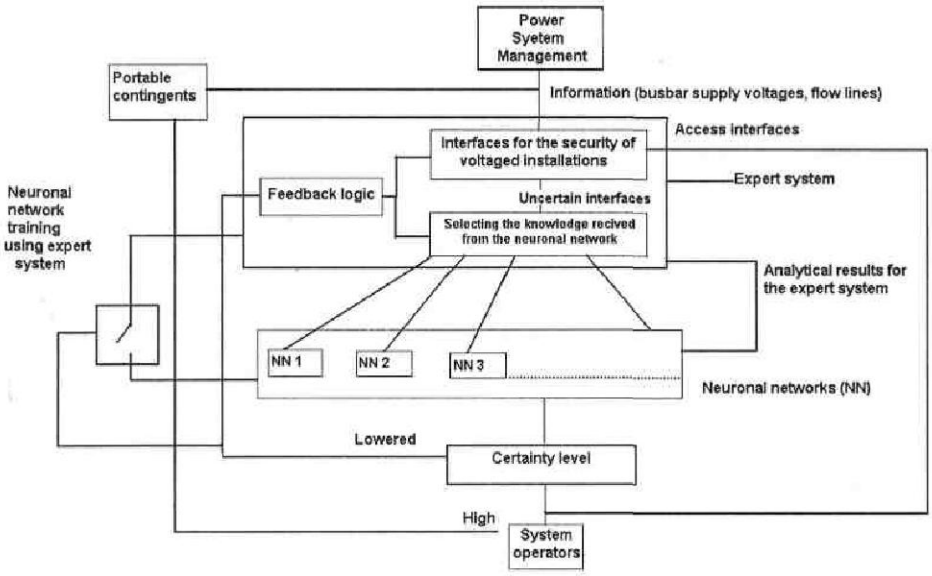

Fig. 4-5 Hybrid expert system in the artificial neuronal networks design

2) Model of combining the maximum and minimum profit based on optimism and pessimism coefficients

$$M^{Nurwuz}_{combinatory} = \max\left(c^{optimistic}_{coeficient} \max\ p_y + c^{pesimistic}_{coeficient} \min\ p_y\right)$$

3) Model of minimum economic regret (r_{ij})

$$M^{savage}_{\substack{min\,im\\economic\\regret}} = \min_i\ \max_j r_{ij} = \min_i\ \max_j \left(p^{max}_{ij} - p^{min}_{ij}\right)$$

4) Decision model based on information entropies

$$M^{inf\ ormation}_{entropy} = \left[E^{managerial}_{entropy} + E^{int\ egrated}_{\substack{process\\entropy}} + E^{entropie}_{evenimente}\right] = \min im$$

$$E = -3{,}32(p_{succes} \cdot \lg p_{succes} + p_{insucces} \cdot \lg p_{insucces})$$

$$p^{success\ probability}_{\substack{management\\int\ egrated\\process}} = \frac{ts}{tc} = \frac{t_{functionare}}{8760}$$

$$p_{\substack{robabilitatea\ de\\insucces\ pe\ trei\\cauze\ (management\\proces\ int\ egrat\ si\\evenimente\\vu\ln erabile}} = (1 - p_s) = \frac{8760 - t_{functionare}}{8760}$$

t_t = operating time of desgined objective = t_s

5) Models based on compared operational research

$$C_{tan_1}\hbar \le C_{tan_2} + C_{tac_1}\hbar \le C_{tac_2};$$

$$C_{tac} = \sum_{i=1}^{n} (1 + r_a)^{-i} C_{tan}$$

$$C_{tan} = \left[C_{DD} + C_{CC} + C_{PR} + C_{RU} + C_{EF} + C_{DC}\right] = \min im$$

$$r_a = r_{interest} + r_{inflation} + r_{risk}$$

$C_{DD} = C_{search} + C_{forecast} + C_{risk} + C_{cs} + C_{as} =$
= development cost

$C_{CC} = C_{material\ resources} + C_{wait} + C_{marketing} =$
= commercial cost

$C_{PR} = C_{reengineering} + C_{economic\ state} + C_{quality} =$
= production cost

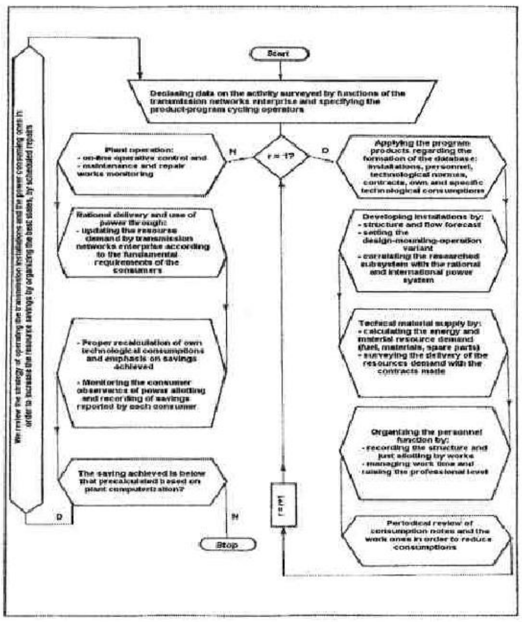

Fig. 4-6 Logical design of power plants economic operation

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$$C_{RU} = C_{\substack{\text{empathy}\\ \text{(personnel}\\ \text{training)}}} + C_{\substack{\text{ergonomic}\\ \text{(job design)}}} + C_{\substack{\text{norm}-\\ \text{salary}\\ \text{productivity}}} =$$

= human engineering costs

$$C_{EF} = C_{\substack{\text{fund}\\ \text{dormation}}} + C_{\substack{\text{price and}\\ \text{tariff grounding}}} + C_{\substack{\text{birotics}\\ \text{accounting}}} =$$

= price and tariff grounding

$$C_{DC} = C_{\substack{\text{decizion}\\ \text{ma ker s}\\ \text{training}}} - C_{\substack{\text{decision}\\ \text{making}}} + C_{\substack{\text{result analysis in}\\ \text{source}-\text{consumer}\\ \text{hierachical correlation}}} =$$

= decision making costs

The predictable models based on neuroexpert systems have a considerable advance to the current achievements in the computerization of power plants and transmission networks monitored by the most efficient concepts of software engineering. Our assertion is based on the achievement of the Japanese robot that runs commands after human thinking and it is reasonable to ask what spectacular results we expect from Japanese computer specialists in the near future.

The application of the superquantic decision model at the level of the inclusive power plants of the electric networks in operation and those that will be designed until 2020 can be achieved following the logistic sequences in Figures (3-5) and (3-6).

The archemic improvement of the sustainable development solutions of the energy objectives (power plants, networks, power consuming facilities) are made by using the evolutionary calculation resorting to the Darwin II and Segal programs.

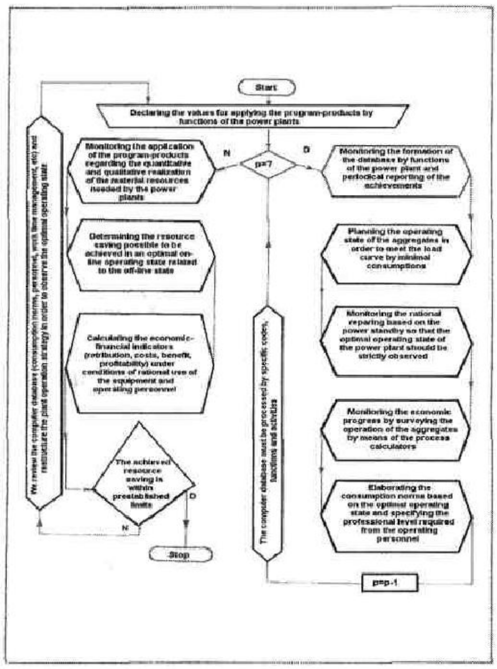

Fig. 4-8 Logical design of power plants economic operation

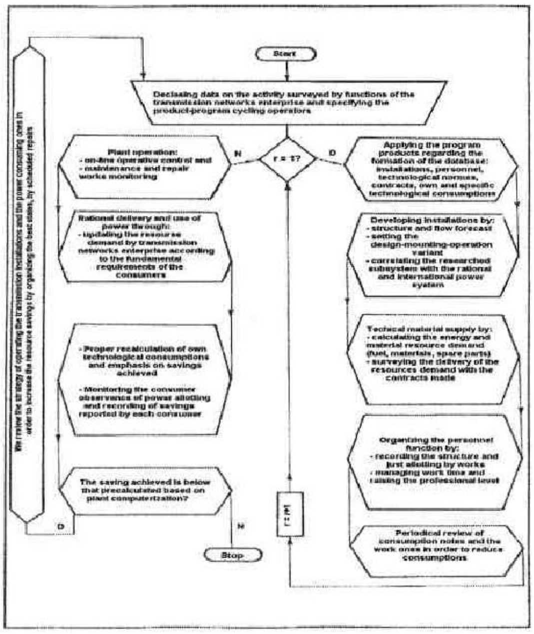

Fig. 4-9 Logical design of the optimal operation of the transmission networks

5. PROJECT MANAGEMENT BASED ON CONVERGENT ENGINEERING

Applying the new guidelines on the design of energy objectives of the national power system must be made simultaneously with the implementation at all levels of the concept of project management. The Guide to project management published in the publishing house CODEX - 2008 and Economic Publishing House - 2009, Also in Editura CODECS - 2006 was published a study on the tasks of the project manager conducted by R. Newton. The Gower Handbook of Project Management was designed by J. Rodney Turner and Stephen J. Simister being translated and published in the Publishing House CODEX -Bucharest - 2007.

The key issues to be retained by Romanian specialists as entrepreneurs of the future projects in the new design management are mainly the following:

- Knowledge and implementation of energy programs that reflect the core of project management.
- The structure of the studies carried out in the design of project management
- Information systems devoted to achieving the energy objectives in the new holistic concept of project management
- Realization of the projects that add value to the products for consumers in the electricity market
- Working methods of the innovative concept of the entrepreneur project management
- Management of quality -risk-cost correlations on the whole production - competitive market line.
- Total Resource Management in holistic design.
- Total risk management
- Management of implementation of energy achievable objectives based on project management developed in operational research.

- Management of economic and financial aspects of projects and operation of energy objectives based on real facts.

- Application management to energy field of the methods of reengineering (Benchmarking, SWOT, Pareto, and software engineering and reengineering costs).

- Reconfiguration management of human resources in selecting quality specialists who will develop studies in the project management design.

- Total domestic and international relations management - business, commercial, cultural, entrepreneurial, (the conflict situations, issues of ethics, etc.) between managers and performere and between the products tenderers and consumers in the competitive energy market.

- Management of justification of the optimal project solution for improving the quality of energy products and processes of the human experts to reconfigure to work under conditions dictated by convergent engineering aimed to shorten the product development and lower total costs to date. The final solution is based on calculating the rate of capital formation based on value risk correlation with profits made on the basis of costs internally and externally correlated and based on minimal information entropy minimization.

6. CONCLUSIONS

Reconfiguring the design and operation of the energy objectives the national power system in order to pass from the traditional concepts to those innovative dictated by the sustainable development of Romanian energy sector as considered by the operational research as premises of the project management becomes a key priority in the development stage of the whole national economic system.

In this guidance material designed takes into account the emphasis upon the innovation of the Romanian design goals from the principles of sustainable development and the models of the computer assisted operational investigation. In this approach the authors began the dissertation with the formulation of problems and have synthesized the principles of evolution with minimum loss of all power plants connected holistically in order to open the box of restrictions causing shortcomings at all conceptual and operational levels of creating and operating with minimum risks of the Power System National and beyond.

After building new models to optimize structures and power flows on the primary resource-competitive energy market line, we passed to the analysis of the computerization of the future national energy structures and recommend the innovation of system informatics due to the design and implementation at different levels of technology of neuroexpert and expert systems, insisting on the creation of new mathematical models that will work with neurogenetice structures similar to those of the human brain. In the last two parts of this material is presented the models of building the quantic and superquantic decisions of the selection of the variants of the NPS evolution with minimum economic regret from the economic-financial aspect. As an opening to changing the current work system in the design of energy objectives we proposed a new design system called Project Management. On these innovations the authors will return in the future issues of the Buletinul ISPE with details on the design of NPS energy objectives and with a new level of the realization of the design budget achieved in operational research. On this new path we will flatten some gaps and create new sources of growth of the total revenue.

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