EVALUATION, USING MANY CAUSES MODEL, THE SECURITY MANAGEMENT OF HIGH BURNING INSTALATIONS

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Abstract:
When the measurement model fits the data set, multiple indicators of each latent variable are converging towards a single core construction; this is the set of one-dimensional measurements of each building that characterizes the convergence measurements, says otherwise the validity of the situation. Measurement errors (measurement reliability) must fall within an area as small as possible.

Key words: *model, coal, fuel oil, errors, variables*

JEL classification: *M19* –Business Administration - Other

Model of energy supply thermal operating in three stages. In the first stage the source of intermittent power sources intermittent processing tasks as negative; second, it optimizes the use of storage so as to reduce the cost of operating the system and process store power by treating the discharge power as a negative load and charging a positive pregnancy, and finally, the third stage, her step processing the power source using an order of merit.

A control module provides universal model of energy and hourly load profile. The command also provides power generation profiles for each normalized hourly intermittent technology.

It should be noted that the model treats the intermittent sources, the sources and processed separately store energy.

Hourly power generated by an intermittent source is equal to the nominal capacity of amplified configuration generated normalized. A profile \ "net \" load is generated hour time decreased power production from intermittent sources each profile given task, so that an intermittent source is treated as a negative load.

Critical tasks negative method has its roots in general interested in arguments based on statistical variation. Hourly value of instantaneous power source is not instantaneous. There is an average hourly value beyond. Stored energy is optimized by reducing the use cost of operation. The general rule is related to the cost of operating the source and replaced must be greater than the cost of operating efficiency relative to the storage source used as a source of recharge. This process is not in the least, but not entirely optimal.

The model calculates energy production energy generated by each source processed. Energy generated by each source is determined to reduce / minimize the total cost of operating the system.

From a net load profile and developing a curve on net during the loading arrangement of individual tasks in descending order, resulting in a graph on the vertical axis is the power or load.

Area under the curve length is the net total energy load in kw / year, which must be provided by processing technologies.

Technologies or sources are arranged in order of value

Horizontal axis values are converted to fractions of hours a year in which excess power is associated with the vertical axis.

The algorithm used to calculate energy products, including effects arising from the period of inactivity during the maintenance period and is presented as follows (AES Corporation, Fossil Energy Policy 2 Documented Moel listing, vol.III, Electricity Generation, Arlington, USA, 1991).

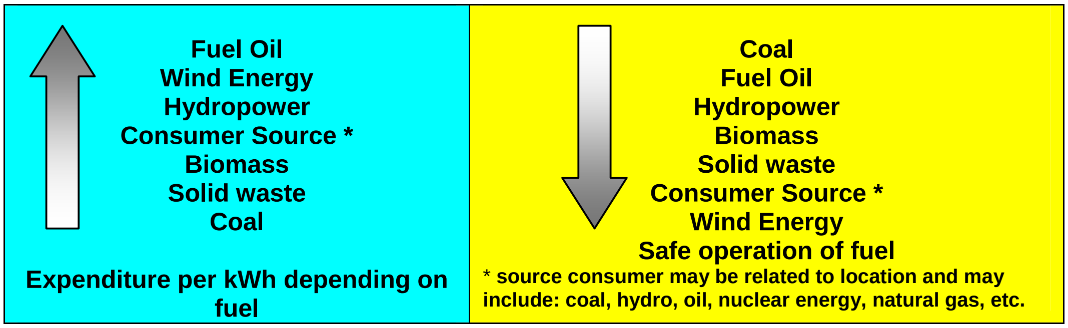


Fig. 1 Evaluation of fuel
(source: Otter Tail Power Co., USA)

Maximum energy produced by a technology (technology) can generate the E_{im} given equation:

$$E_{im} = P_i(1-\alpha)(1-\beta)$$

where E_{im} is the energy produced by the highest technology i and the ability of P_i and a time of operation $(1-\alpha_i)$ $(1-\beta_i)$. If E_{im} is kw / year, must be multiplied by the time of operation.

Energy related technology is capable of producing E_{ig}, and is equal to the area below the curve of duration of loading is given by the ability of the reduced energy technologies generated by previous:

$$E_{im} = \int_0^{U_i} u(\lambda)d(\lambda) - \sum_{n=1}^{i-1} E_n$$

$$U_i = \sum_{n=1}^{i} P_n(1-\beta) < \Lambda$$

$$U_i = \Lambda$$

actual energy generated, E_i is less than one of the following, namely:

E_i = the lowest of the E_{im} and E_{ig}

where: E_i is the energy produced by the technology i in kw / year;

P_i average capacity in appropriate technology kw;

α_i the time without shedulul maintenance;

β_i the time periods without stopping;

U_i total capacity replaced by technology i in kw;

u (λ) inverse load duration curve of the operation;

Λ peak load of the system.

Model of capacity expansion should include information on the evaluation of existing production, and upload information on the cost of technology from the command module and selected combinations of new processing, intermittent and storage capacity which will reduce the amount of capital cost for the new facility plus the future annual cost of operating the operating system. Reduction will result in decreased cost of producing electricity for the operating system.

In Romania, the evolution of the structure of gross production of electricity by type of plants is shown in Fig. 2.

In terms of energy production at current capacity, the problem of production capacity expansion, subject to the use of different types of fuels, must take place only with providing a security management to enter all the variables required for the safe operation of existing plants.

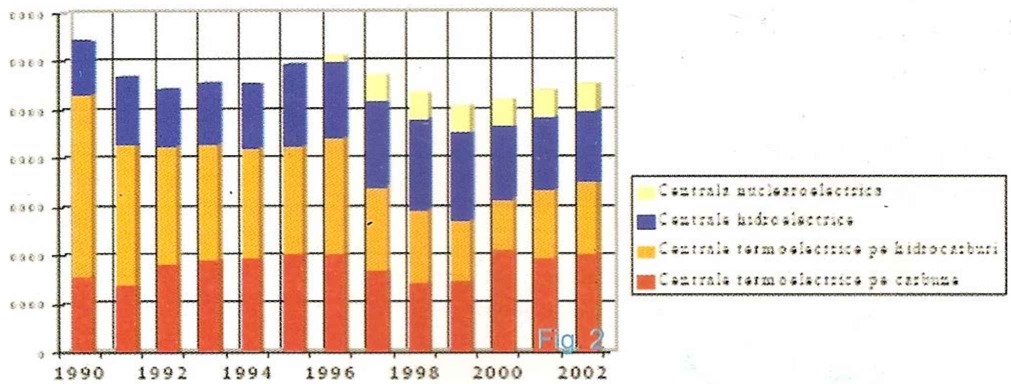
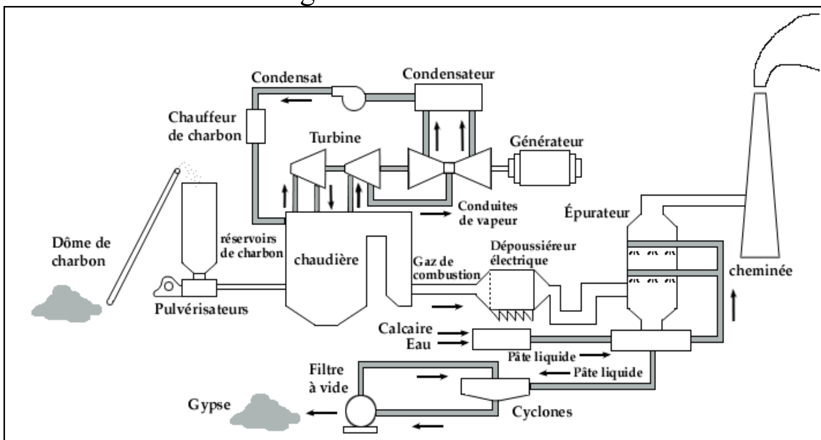
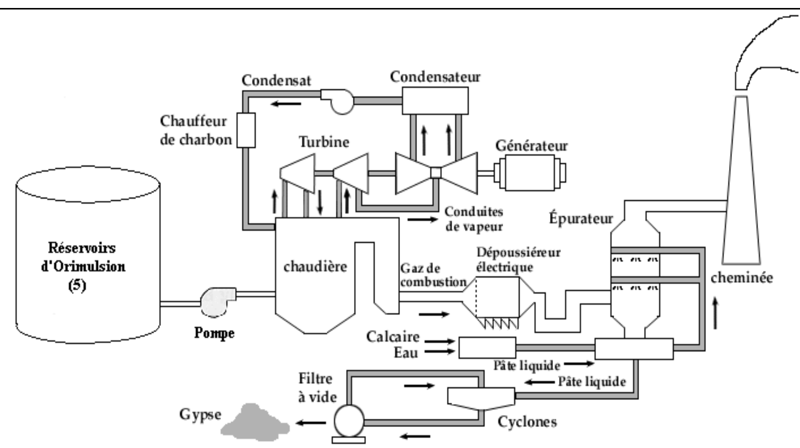


Fig. 2 Evolution of the gross structure of production of electricity by type of plants in Romania

With the exception of plants that use nuclear fuel, models of typical plants in Romania are similar to those in Fig. 3



a. Central thermal coal for electricity



b. Central thermal power on liquid fuel oil

Fig. 3 Types of central thermal power fuel used by

Understanding the elements of effective management of safety in operating power plants to produce thermal energy electric white must be based on the following:

- understanding the nature and number of variables relevant security scenario for any given situation;
- detailed understanding of organization and operation of these variables adapted for use as possible scenarios.

Depending on the introduction of these variables in the analysis can develop management models that based on the following assumptions:
H1. Changes in motivational control of technical and safety performance explicizate by many causes model in which to intervene and:

H2. The existence of close links between the staff and security performance;

H3. The motivational and technical controls closely related to the degree of contract management;

H4. The high-performance security checks carried out in conditions of insecurity.

Description x_1 ... x_{23} measurements are presented in Table 1 and can be classified according to the level at which management is evaluating security IMA (fig. 3.). As follows:

- variables relating to contract management;
- variables relating to motivational;
- variables relating to the technical;
- variables relating to group processes.

Table 1

Classification of variables measured

Variable	Function variable	The variable description
X_1	Attitude security manager power	Worker's perception of security management, in particular the degree to which security is valued is reflected in high productivity. Essentially, this variable will measure the values, principles and priorities of the person who is the manager involved in work.
X_2	Security checks and the reporting	Will be measured against the perceived benefits and the best frequency / conscienceless security controls and these controls have led to prompt and effective correction of hazards. Measured the frequency with which checks are carried out by the security manager and the IMA officials designated.
X_3	Planning security	Measure the perception by workers of the hazardous operations of the production process, which are anticipated management and effective steps have been taken measures to remove or limit them. Preparatory measures should include special training to cope with these hazards.
X_4	Responsibility	Perception and attitude extended to examine closely the performance supervisor manager.
X_5	Control of subcontractors	Measured by the manner in which the manager chooses its subcontractors and how they work together harmoniously and for performing security work.
X_6	Security interest holder	It measured employee perceptions of interest or indifference to the conditions of security.
X_7	Status responsible security project	Is measured by the perception of workers and the authority responsible for preparation and expansion that must take its recommendations.
X_8	Behaviour supervisor / manager	Measure employee perceptions of the person ability to communicate and interact with others, and the manner in which the contribution is respected and taken up by others
X_9	Attitude towards security	Measure employee perceptions on how it is understood that the manner in supervisor / manager shows this information

		by date and by the way in encouraging the behaviour of security
X_{10}	Group processes and interpersonal	How to measure perception by workers of coordination between various groups and measure the degree of positive or negative pressure in response
X_{11}	Orientation and training	Seen both in terms of drafting instructions for the type of security required for conducting quality training and technical
X_{12}	Order in the workplace	
X_{13}	Controlling physical hazards	
X_{14}	Control of mechanical hazards	
X_{15}	Control health hazards	
X_{16}	Ensure security equipment	
X_{17}	The degree of understanding of the relationship between security and health	Measure the degree of perception related to each latent variable defined by
X_{18}	Experience and qualifications	
X_{19}	Attitude toward security measures	
X_{20}	Tended to meet the risk	
X_{21}	Stability and reliability	
X_{22}	Alcohol with drugs	
X_{23}	Stress	

When evaluating the measurement may be used and a more efficient scale "The Smile Face Assessment Scale - tear representing a number of attitudes of a scale for assessing affectivity from a domain register face.

It is a method that is based on understanding the psychological profile questioned face [4].

When the measurement model fits the data set, multiple indicators of each latent variable are converging towards a single core construction; this is the set of one-dimensional measurements of each building that characterizes the convergence measurements, says otherwise the validity of the situation.

Statistical variable $\mathbf{c}^2$ is used to assess dimensionality study.

Measurement errors (measurement reliability) must fall within an area as small as possible.

Using Fig. 4 as an example, the variant contains a measurement x_1 score real result of the influence of time and error x_1 variant date δ_1. If there are errors in measurement conclude that variation assumed indicators was completely explained by the construction of a x_1 unlikely event [12].

Hypothetical model of measurement is compared, as the case with a model that was in a restricted way. For example, if x_1 latent variable model of measurement in fig. 4 is strongly correlated with the latent variable x_3 is difficult to support the hypothesis that they are distinct concepts. As a test model in fig.4 can be compared with a model in which correlation between the two alternatives is restricted to the value 1.

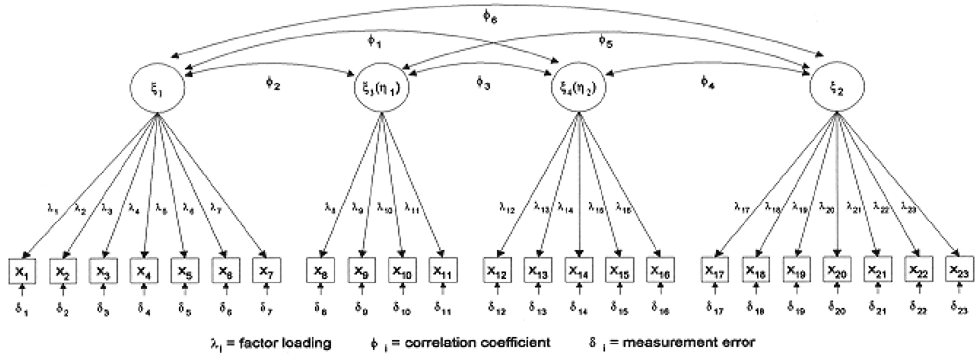


Figure 1. Hypothesized Measurement Model

Many causes model of Fig. 4 specifies the types of hypothetical relationships between the five latent variables.

Security management performance can be measured by three different routes: the investigator's observation, description, worker or reporting Approximate placed another person (Staton, W, A. How Variables Influence Project Construction Safety Performance, 1995, USA).

Conclusions

Assumptions on the analysis of safety management performance of two types of models characterized by five variables and their effects, the correlation being built from empirical measurements of variables, driven by structural equation modelling - a technique of multivariate analysis of series relationships of dependency between variables and latent observed simultaneously created.

Description and classification variables measurement was made in accordance with the level at which management is evaluating security

BIBLIOGRAPHY

1) Enescu, M., & M, *Impactul combustibililor alternativi asupra sanatatii si a mediului*, Info GPL, nr.17, Bucuresti, 2005;
2) Enescu, M, Zecheru, I. I., *Eficienta managementului de securitate al instalatiilor energetice,* Monitorul de petrol si gaze, 9(55), Bucuresti, 2006;
3) Erven, B. L., *The Functions of Management*, Ohio State University, 2004;
4) Ionescu C., *Cum să construim şi să implementăm un sistem de management de mediu în conformitate cu ISO 14001*, Editura Economică, Bucureşti, 2000 ;
5) Kauffmann, S., *Investigations*, Oxford University Press, UK, 2000;
6) Leca A., *Principii de Management Energetic*, Editura Tehnică, Bucureşti,1997 ;
7) *Overcoming Procrastination*, UB-Counseling, Buffalo, SUA, 2006;
8) *OECD Guidance on Safety Performance Indicators*, Interim Public., 2005;
9) Smith, W. H., Howard, C. R., Foord, A. G., *Alarms Management – Priority, Floods, Tears or Gain?*, 4-Sight Consulting, SUA, 2003;
10) Stamps, J., Lipnack, J., *A General Network Theory for Organizations*, Netage, SUA, 2005;
11) Yang, Heevon, *Establishing the Reliability of the Smile Face Assessment Scale: Test-Retest*, Kent State University, Ohio, SUA, 2004;
12) Zecheru, I. I., Enescu, M, *Managementul de securitate în centralele termo-electrice*, Monitorul de petrol si gaze, nr.1, Bucureşti, 2006;