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APLICAŢII ALE CERCETĂRII OPERAŢIONALE ÎN PROBLEME DE CONDUCERE, ORGANIZARE ŞI PLANIFICARE A LUCRĂRILOR DE INVESTIŢII, CONSTRUCŢII ŞI MONTAJ.

(Applications of Operational Research in Problems Concerning the Management, Organization and Planning of Investment, Building and Assemblage Activities)

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The publication of this volume is successfully added to the still reduced number of works presenting practical applications of the latest conbuests of mathematics. This publication proves once more the increasing tendency manifested on a world plane for the introduction of modern mathematical methods in the study of applicative sciences. The work may interest very large circles of specialists, technical-engineering staff, economists and mathematicians involved in solving investment or building-assemblage problems, since the sphere of the applications presented is extremely large. The energetic field analysed by the authors raises so very complex and varied problems that their solution leads to the clarification of problems which might occur in any other field.

At the beginning of the work, the authors examine the problems of the best location of the organizing units of the sites (with concrete application to the Chişcani thermo-power station site), of the dimensioning for the best stock of technological equipment stores, of the best inter-connection of several power stations, of the dimensioning of the expectation systems (with application to the dimensioning of the technological equipment pre-assemblage platforms), of communication and traffic in the productive enterprises and on the site as well as the problem of the best location of a supply source (electric power station, transformer post, oxygene factory, etc.) for several consumers.

The solving of these problems by determining the optimum is leading to the economy of investments and to the shortening of the execution term. The mathematical methods used are most varied: linear programming (the theory of best assignment and the problem of transport), the theory of graphs, the theory of expectation, the theory of the Markov type processes, the best configuration of arborescent networks, etc.

The problems presented in the chapter "Production capacities, productivity and resource distribution "refer to the ensurance of the rate of carrying out of investments and the planning of resources. The com-

putation method of the number and efficiency of the cranes necessary for the assemblage operations in steam boilers, the calculation of the best path of the assemblage flow and of the optimum number of equipment necessary for production processes, the calculation of the number of service stations in expectation phenomena, the calculation of the capacity of the metal manufacturing workshops with a varied and unrhythmic production, are presented and exemplified among other things. The computation methods of the necessary resources in the assemblage of complex installations and the calculation of the number of motor vehicles necessary for the transport of the personnel on big sites and of the necessary staff in designing activity are also dwelt on. Just as in the previous chapter, the mathematical methods used are, extremely varied: the Monte Carlo method, mathematical statistics, linear programming and in whole numbers, stochastic networks, the allocation of resources, fluency graphs, etc.

Approaching the problem of the programming of work and of optimum planning, after a brief presentation of the critical path method and of the way of calculating the margins, they pass on to their exemplification through the optimum programming of the set of activities in carrying out the investment of an electric transformer station and the assemblage of the boilers at a thermo-power station. The entire process of the carrying out of an investment capable of being modelled by a graph (by using either the MDC or PERT method), one may act upon their various ramifications in view of optimizing the total duration taking into consideration other necessary restrictions, namely: the reduction of the cost price of work, the flattening of the resource utilization curve, etc.

In conclusion, a number of mathematical methods are applied in solving the general problems of the enterprises. In this way, problems are approached in connection with the organization of the management of a site (with application to the management of a site by a control system), decision problems solved with the Markov chain theory (the situation of accidents in an enterprise, the situation of the training of the workers of an enterprise, forecasts in the fied of household lectric consumption), decision problems solved with the aid of the information theory or with the aid of the theory of graphs.

The volume comprises an appendix signed by university lecturer, dr. Sergiu Rudeanu dealing with some practical applications of pseudo-boolene programming.

Although the authors presume the elements of modern mathematics to be known, what makes them, in many cases, to refer only to the methods used in computation without illustrating their conduct to the final result, however, the study of the work is accessible to a large circle of specialists. The way of approaching the problems and their logical concatenation allow the gradual introduction of the reader into ever more complex and thus more difficult problems.

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