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INTELLIGENCE BRIEF

DSSR USING NEW METHOD
TO PLAN AND SCHEDULE WORK
ON CONSTRUCTION PROJECTS

DIRECTORATE OF INTELLIGENCE
Office of Research and Reports

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USSR USING NEW METHOD
TO PLAN AND SCHEDULE WORK
ON CONSTRUCTION PROJECTS

During 1964, for the first time, the USSR introduced a new method of planning, scheduling, and managing construction projects -- commonly known in the US as the "Critical Path Method" (CPM) -- at four construction projects. These were the Chelyabinsk automatic blooming mill, the urea complex and thermal electric powerplant of the Lisichansk Chemical Combine in the northern Donets region, the Burshtynsk state regional powerplant in western Ukraine, and the Smolensk electric bulb plant. During January 1965, five additional projects were reported to have adopted CPM, and many others are actively preparing to convert to this method. It is proposed to employ CPM on several hundred construction projects, including a hundred chemical construction projects, during 1965.

1. Background

CPM is a method of planning, scheduling, and managing construction projects developed by the Remington Rand Corporation for E. I. du Pont de Nemours Company in early 1957. It was applied to a \$10 million du Pont construction project in 1957, and since then it has come into widespread use in the US. At about the same time that du Pont was working on CPM, the Special Projects Office of the US Navy and Booz-Allen and Hamilton, Management Consultants, were working on a similar scheduling and progress management system for the development of the Polaris missile, called Program Evaluation and Review Techniques (PERT).* The completion of the Polaris project well ahead of schedule was credited in part to PERT. As a result, the US defense agencies now require PERT or CPM for all major projects.

In the USSR, CPM is referred to as "network planning and directing" (setevoye planirovaniye i upravleniye -- SPU). One of the most important phases of CPM is the construction of an arrow diagram -- in Soviet terms a "network schedule or diagram" (setevoy grafik). The arrow diagram indicates all the activities necessary to complete a project, graphically

* For a detailed description of CPM and PERT, see The Constructor, September 1961, pp. 24-29, and January 1962, pp. 28-30, and Construction Methods, May 1962, pp. 130-135.

indicates the length of time required by each, and shows those that must be completed before other activities can begin. In a small project an arrow diagram may be constructed, time estimates made, and the critical path calculated manually. The critical path is the route of principal activities on which the duration of the entire project is determined. The remaining activities, which are not on the critical path, have a reserve of time, and a change in the dates of their performance (within limits) will not affect the course of construction. On a large project incorporating hundreds of items, time-cost estimates for most activities and a spectrum of schedules must be developed by a computer.

As work on the project proceeds, the diagram is reviewed and recalculated periodically, incorporating new data concerning progress that have been collected from the field. As the status of construction changes and as different activities move into the critical path, management is alerted to any lagging operations in time to initiate corrective measures.

2. Soviet Application

At the urea complex in Lisichansk a volume of construction-installation work of several million rubles was being carried out by 22 construction and installation organizations. It is claimed that the CPM network of some 800 activities, or items, calculated by computer permitted the work to be accomplished in 1-1/2 years instead of 2-1/2 years as indicated by Soviet construction norms. The Chelyabinsk automatic blooming mill reportedly was built in 1 year instead of the normal time period of 2 years.

On three of the projects converted to CPM in 1964, and completed in that year, work had been underway for some time. Only in the case of the Smolensk electric bulb plant, which is scheduled for completion at the end of 1965, was CPM introduced early in the construction period. These projects, designated as experiments in the use of CPM, appear to have progressed faster than is normal for Soviet projects of a similar type and magnitude. The extent to which this is attributable to priority of supply and intensified interest of management in pushing the project versus better organization attributable to CPM cannot be determined at this time.

The use of CPM will aid Soviet builders in planning and reducing costs through improved scheduling but will not be a panacea for all

the problems of the Soviet construction industry. CPM can indicate what materials and equipment are necessary and when they must be received to complete the project on time. If, as in the past, the suppliers do not furnish the materials and equipment when needed, CPM cannot prevent delays. Improved direction at the work site and timely recognition of problem areas, however, should decrease duration of construction significantly.

Widespread application of CPM to construction in the USSR will require further standardization of accounting methods and the creation of a large number of computing and information-processing centers. One Soviet engineer has estimated that the computing centers will cost approximately 100 million rubles. He notes that although this is a considerable sum, it is worthwhile because the application of CPM should result in a saving of at least 1 or 2 percent of the cost of construction-installation work, or 300 million to 400 million rubles in a year.

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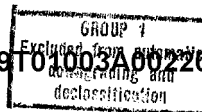
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