

# Determination for mine construction project time and its parameters using network planning technique

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**Keywords:** Mine Construction; Project Time; Parameters; Network Planning Technique;

**Abstract.** Mine construction is a large complex engineering projects, it include a large number of roadway engineering in underground, the ground construction and a large number of electrical mechanical equipment installation engineering, These engineering projects restrict each other and contact with each other, how to organize the most reasonable construction, To achieve the comprehensive planning, unified arrangement, and how to complete the task economically, to solve this problem, network technology provides scientific methods and effective way. In this paper, authors compile a mine construction organization design general program using network planning technique, The program input data is concise, easy to operate, it can be used to analyze complex network problem, and to solve production actual problem effectively and practically, it can be easily used to determine construction period and the process parameters and the key lines, It has been successfully used for Chengzhuang coal mine construction project network organization diagram, that can be regarded as a kind of scientific and practical method.

## Introduction

As a branch of system engineering, network planning technique is a methods on production organization and management. The scale of the modernization of the mine production and construction is more and more big, activities is more and more complex, process is various, how to organize the most reasonable construction, To achieve the comprehensive planning, unified arrangement, make each link with each other and how to complete the task economically, to solve this problem, network technology provides scientific methods and effective way.

Mine construction is a large, complex projects.it include a large number of roadway engineering of mine underground, and a large number of the ground construction, and a large number of electrical mechanical equipment installation engineering, These engineering projects restrict each other and contact with each other.Such a big project network, with the hand count clearly don't adapt, it need computers to both fast and good solution to this problem, the network electric algorithm provides extremely effective means for this purpose.

Jingcheng coal group play a leading role to coal, coal gas developed, coal chemical industry development, machine manufacturing, construction and installation, real estate development, biological pharmacy, travel, printing and other industries, is a national large coal base.

Chengzhuang coal mine was build in 1989, it was build well 1997, the annual design production capacity of 4 million tons. as the significantly increase of production, economic and social benefits

produced by the whole mine is very good. Infrastructure construction of the mine to the first-class, residential buildings, with star hostel service first-class, the mining green area reached 35.5%, lush, greening, beautification, purification take different design style, fill ditch stretched to build modern football field, the arena.the whole coal mine display modern mine. as is shown in Fig.1.

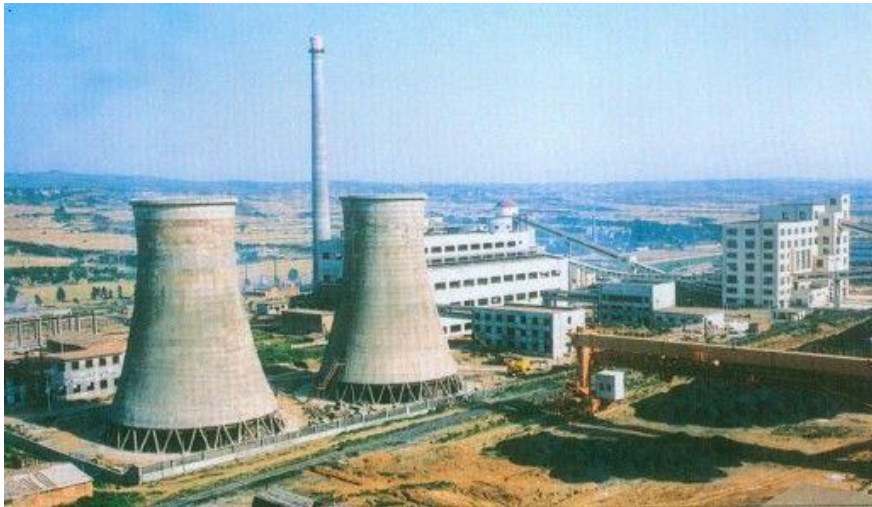


Fig.1 Chengzhuang coal mine

## Network Model

Network planning technique is applied to the planning and control of the project, it is a management technology. according to its origin, it is the critical path method (CPM) and program evaluation and review technique (PERT). This plan by means of network all the work and the time it takes the relationship as well as all the work. Through the network analysis and study the relationship of the project cost and time limit for a project, and find out the critical path in the process of planning and project execution. This method is called the critical path method (CPM); also used the network analysis method and the network planning, it focuses on the evaluation and review the work schedule, the plan is called the program evaluation and review technique (PERT). In view of the difference of these two methods, CPM is mainly used in the past in similar projects have made some experience of contracted projects, PERT is more applied in the research and development projects.

The application of the network planning technology mainly follow the following steps:

- 1 identify the target;
- 2 decomposition project, lists the schedule of work;
- 3 draw the network diagram, carries on the node number;
- 4 computing network time, determine the critical path;
- 5 the optimization of network planning scheme;
- 6 the implementation of network planning

The characteristics of network planning technique are the following:

1 the application of the whole project network diagram can each job interdependence, mutual restriction between relationship clearly. This is the most fundamental advantages of it.

2 it can vividly the whole plan to use the network diagram. this is the mathematical model of the whole plan, it can be application of computer programming to calculate. What can be learned through calculation which is the key work, must ensure finish; What kind of jobs have the potential to dig, facilitate to effective supervision and control plan execution.

3 the pros and cons of different scheme plan can be compared, easy to choose the optimal solution from many feasible schemes into practice.

4 the time limit for a project can be considered along with costs, resource, overall arrangement, the optimization and adjustment to the plan.

### Network Algorithm

Based on the above purpose, the author compiled a mine construction organization design general program in network computing. The program can be run in any machine, the input data is concise, easy to operate, it can be analyzed complex network queuing problem, to solve production actual problem effectively and practically. Network computing program block diagram is shown in Fig.2.

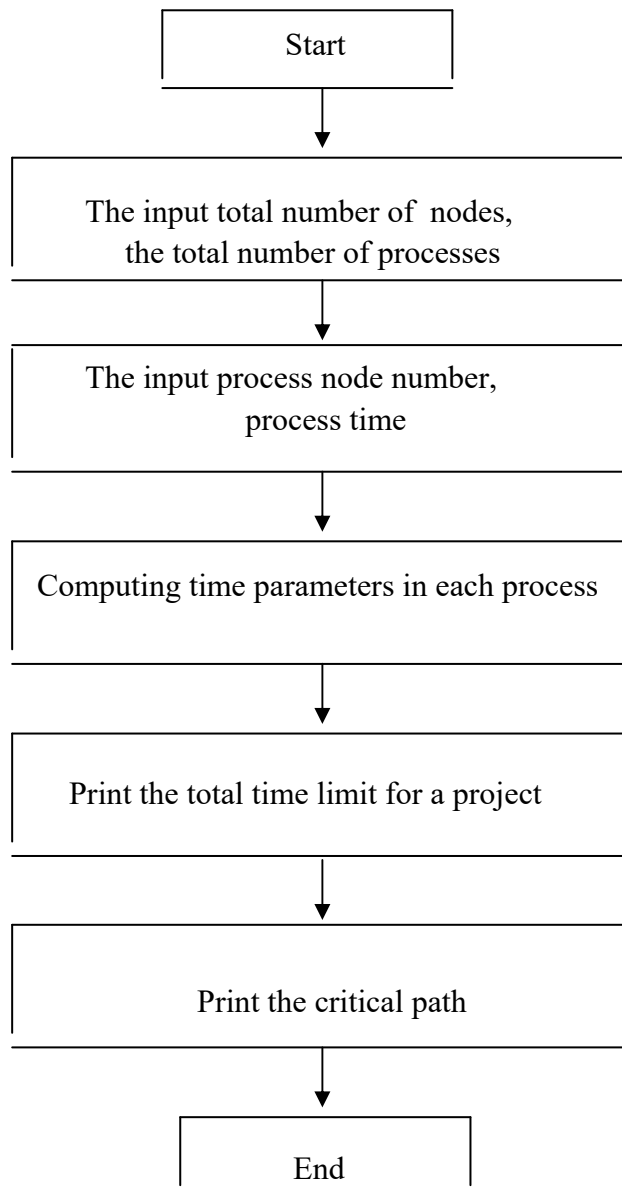


Fig.2. Network computing program block diagram

## The Applications

Chengzhuang coal mine in Jincheng mining bureau the annual design production capacity of 4 million tons. Develop ways for slope mining, field.design transfer of mine,Digging out four shaft, digging a main slope in the industrial site, a main auxiliary slope, at + 640 m shek mun and north and south wing alleys Well connected in digging into the wind a discharging the gangue, open a return vertical shafton its north side.

The author use network plan technology for chengzhuang coal mine Mine construction project network diagram,The network diagram, a total of 127 nodes, the network diagramFigure 3 (limited to space, omit specific content and process in each process), chengzhuang coal mine mine construction project network diagram is shown in Fig.3

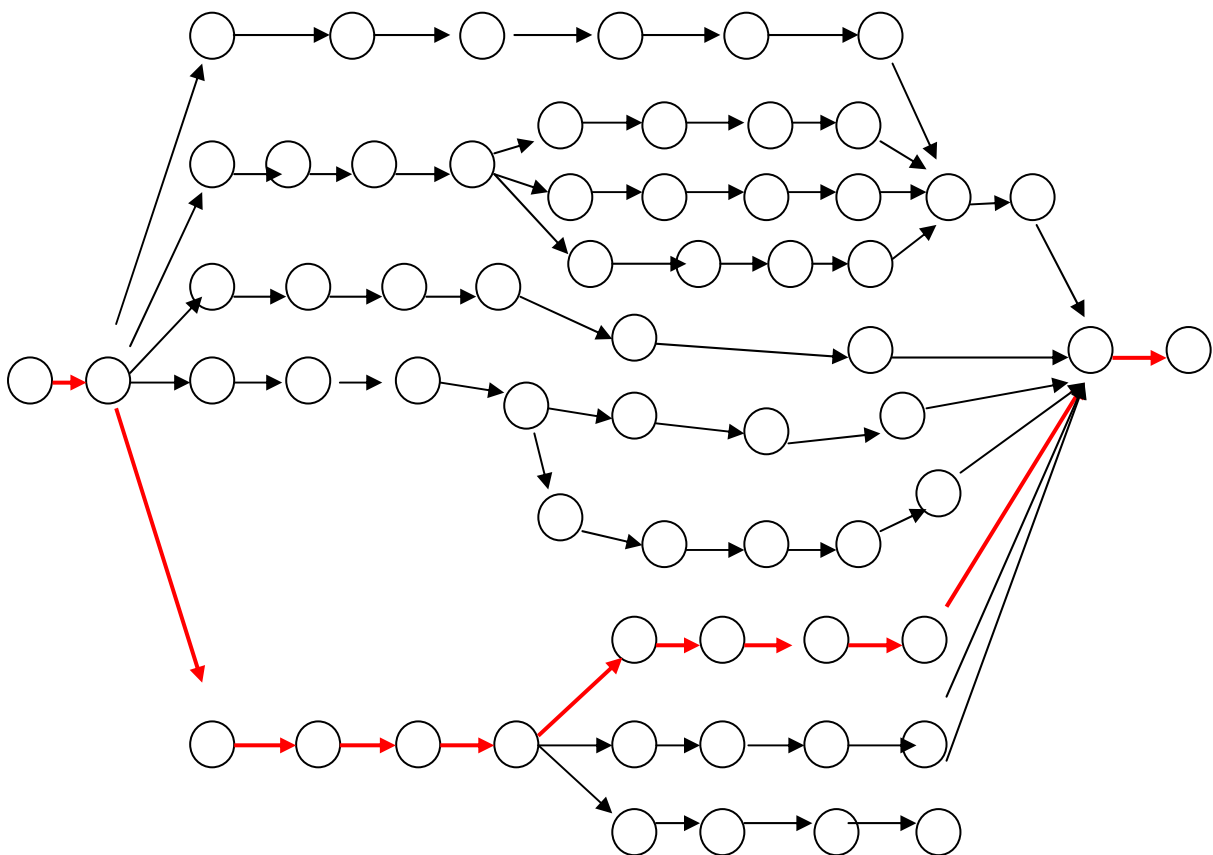


Fig.3 Chengzhuang coal mine construction project network diagram

If mine shaft and project network diagram by hand it is quite complex and miscellaneous.with network computer program, simply enter a few original network data, it can rapidly result in network computing.the computer automatically print the total time for mine construction project is 58 months.The key line is is shown in Fig.3 in red line,various time parameters of every working procedure( slightly). using network technology in the mine construction organization design, when construction network nodes is more complex, calculate analysis is more trapped by hand, it is hard to do.This paper provides a network computing method, it can be easily used to determine construction period and the process parameters and the key lines it can yet be regarded as a kind of scientific and practical method.

## **Acknowledgements**

This research is funded by “The general Project of scientific research of Education office of Liaoning Province of China (L2012436) ”

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