Fişa suspiciunii de plagiat / Sheet of plagiarism's suspicion	Indexat la: 31/06

Opera suspicionată (OS) Suspicious work	Opera autentică (OA) Authentic work

OS	Cristian, V., Schnakovszky, C., „Industrial Project Planning", *Modelling and Optimization in the Machines Building Field (MOCM)*, No.7, Vol.1, p.136-139, 2001.
OA	Moody, H., „Project planning", In: G, Lawson, S. H. Weame, P. Lies-Smith (Eds), *Project Management for the Process Industries*, Institution of Chemical Engineers (IChemE), p.200-228, 1999.

Incidența minimă a suspiciunii / Minimum incidence of suspicion	
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Fişa întocmită pentru includerea suspiciunii în Indexul Operelor Plagiate în România de la www.plagiate.ro

INDUSTRIAL PROJECT PLANNING

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Abstract: The success or failure of a project is usually judged by whether it achieves specific objectives in time, cost and performance. Project time-scales are always being squeezed by management and there is rarely enough time to complete project work, so it is important to makc thc best possible use of the available timc. Project ohjectives are achieved by co-ordinating the efforts of a range of people who invariably have different levels of knowledge and experience.

Keywords: project management, planning, production system

1. INTRODUCTION

The purpose of planning is to manage the future utilization of time and resources on a project. Remember that because of the nature of project work, changes to the plan are almost certainly going to occur at some stage. Therefore, the procedures used for planning must be chosen carefully to ensure that the plan can be updated quickly, so that it remains a realistic guide to the most efficient way of completing the project and achieving the objectives.

Small projects involving no more than familiar activities may be planned simply, but the plan should be agreed to avoid the risk of failing to meet start and completion dates for key activitics. More complex projects involving a diversity of people and organizations necessitate formal procedures and systems for planning. Effective planning entails:

- setting out a desirable course of events to achieve specific objectives;
- establishing the prerequisites (such as obtaining information, materials, contractors) for the chosen course to be realized;
- considering how to deal with foreseeable happenings that will change the initial chosen plan.

2. OBJECTIVES OF EFFECTIVE PROJECT PLANNING

The plan are many reasons including:

- project management entails interaction between people and therefore needs a disciplilled approach if objectives and targets are to bc achieved;
- the complexities involved in a typical project mean that one person can have a full working knowledge of every activity required to be undertaken, and therefore some means of sorting out interrelation ships,priorities and so on is needed;
- if meaningful targets are set, actual performance can be measured and corrective action taken if performncee is not satisfactory;
- productivity can be improved by setting tighter targets/exploring new methods of working;

- 'fire-fighting' and 'crisis management' should be avoided.

The principal objectives of project planning are to:

- provide a means of expressing complex projects in a logical sequence of activities;
- provide an estimate of the time and effort involved in each of the activities which constitute a plan;
- identity the risks involved and make allowances to cover uncertainties;
- improve co-ordination and communication;
- determine priorities;
- reduce project duration and improve time conutrol;
- make better use of resources;
- provide better and more timely data for decision-making;
- provide a means of ensuring performance takes place in line with plans.

3. PLANNING TECHNIQUES

The targets set for the project are invariably time related, In the time scale is extremly short then the plan may be prepared using the day as the basic time unit. Longer duration projects may use the week as the basic unit, or even the month if the project take several years. Compiling a list of the activities for a project is often the most difficult part of the planning process. the main emphasis is on identifying what to be done ithin the scope of the project to achieve the objectives. The planning control may be made with Gantt charts and precedence diagramming.

Figure 1 shows the embryonic work breakdown. The level of detail depends on the curent state of knowledge relating to the project and the organizational structure. Every effort should be made at this stage to put some detail against each of the principal work hierarchical subdivisions. On most project it is advisable to include a general heading of Project management and break it own into work packages involving planning, costing, contractor liaison, performance reviews, reporting and so on.

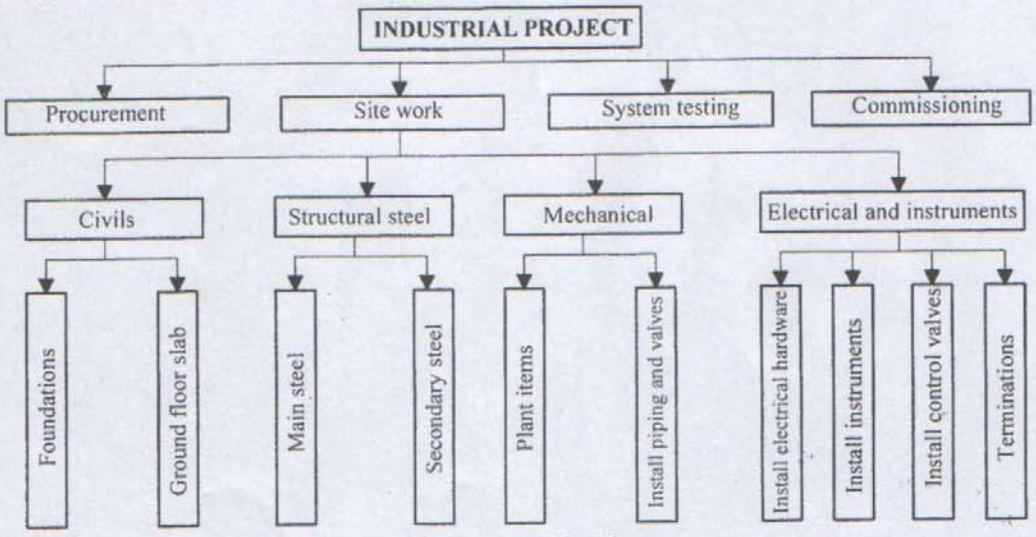

Figure 1. Industrial project

An industrial project is very dificile because the work packages are complex and various: appointing contractors, plant item design, rack piping design, branch piping design, electrical hardware design,

main steel design, modification to existing items, casting ground floor slab etc.

The availability of resources is an integral factor in formulating plans and establishing work schedules. The first step in analysis resource requirements is to estimate the man-hours for activities and work packages. Figure 2 shown the outline procedure. Evolving and using meaningful *norm of performance* is an essential element of effective resource planning. Norms can be derived from detailed analysis of time sheets: provided personnel book to job number, work package number and the key task being undertaken.

The second step in resource analysis is to consider the total demand for key resources. The definition of key resources is likely to differ for different types of project. In particular, consider those resources which are scarce and or costly to employ.

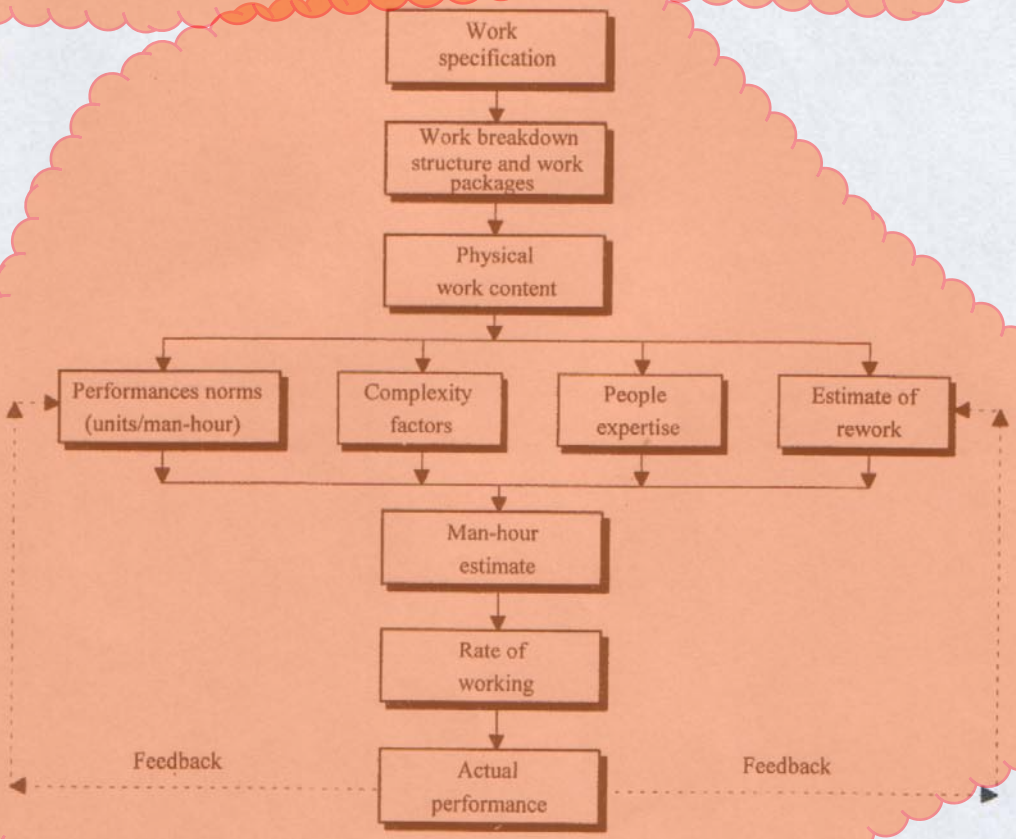

Figure 2. Man-hour estimating model

When resource levelling has produced a satisfactory solution, the start and finish dates for each activity are said to be at their sceduled values. It is probable that only a few scheduled activities will have residual float, that is, most activities will now be critical. All activities are on their earliest start. The entries under the healding have been derived from assessing the total quantity of work to be carried out and dividing by the appropiate norm of performance. For example, if the total quantity of piping is 5000 meters and the norm is 5 meters per man-hour then 1000 man-hours are required. The total standard mean-hours for each activity has been spread uniformly across each bar on the bar chart

and the summation of the man-hours required to be inputted per week is indicate by histogram in figure 3.

Activity	Total standard man-hours	Uniform reate man-hours/ week
General		
GA drawings	100	50
Line diagrams	120	40
Plant items		
Heat exchangers	50	25
Tanks and hoppers	100	25
Other	80	20
Piping		
Piping Gas	60	20
Isometrics	1000	250
Material and valve schedule	60	20
Electrical		
Hardware	60	20
Cabling	100	25
Instruments		
Control data sheets	90	30
Instrument schedules	80	20
Cabling	100	25
Material schedules	60	20
Civils		
Foundations	40	20
Floors and plinth	600	150
Material schedules	120	30
Steelwork		
Main steel	90	30
Secondary steel	100	50

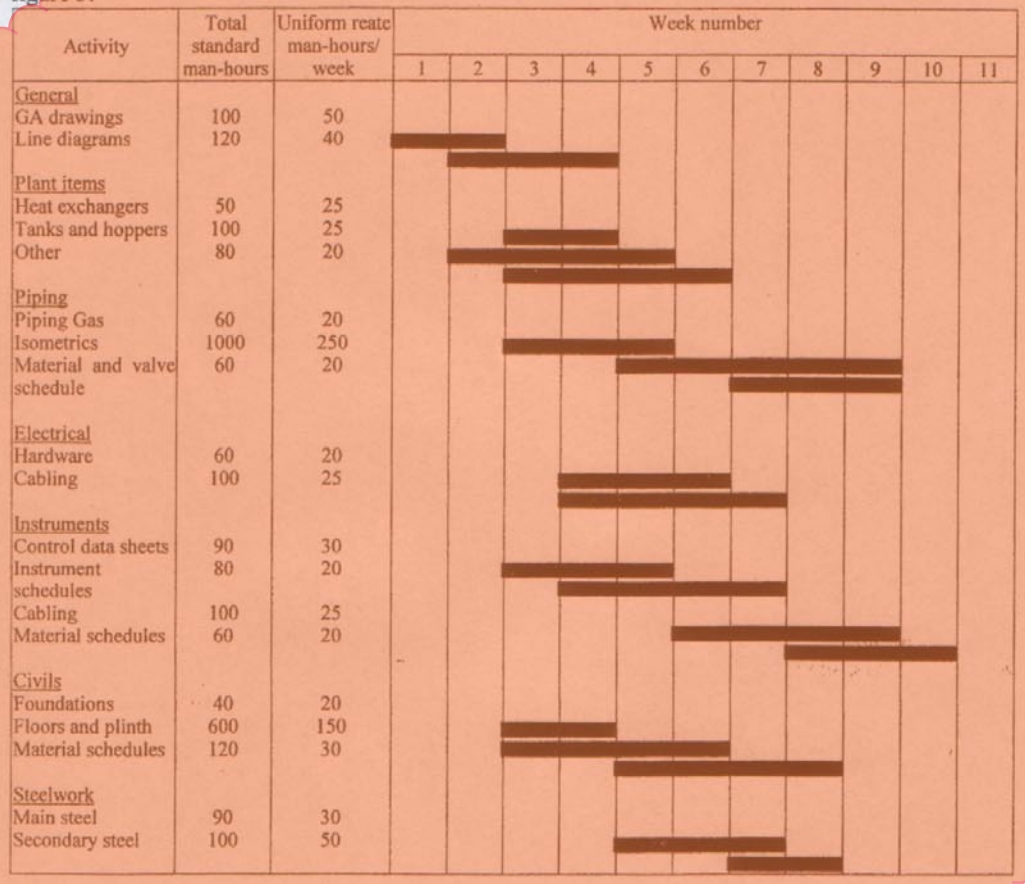

Figure 3.

The histogram of figure 4 indicates that the peak demand for drafting effort will occur during Week 5. If the work package completion has not to be extended beyond 10 weeks and the maximum input of man-hours has not exceed 500 in any one week then the option avaiable include charting:

- the sequence of doing the work;
- rate of working on designated activities;
- daily hours worked;
- the working week;
- continuity of work by splitting activities.

Figure 4.

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