CHAPTER 7

SCENARIO ANALYSIS

7.1 GENERAL

In the present study, the Scenario analysis was carried out based on the ‘what if’ analysis. Five critical factors, namely, resource availability, resource supply related, labour involvement, finance issues and Shortage of labour were considered for the scenario analysis. For the what if analysis, the critical factor parameters were assumed as follows: Very low, low, moderate, high, and very high. One factor out of the above five critical factors was changed, to study the response of those variations on the time overrun in construction projects.

7.2 INFLUENCE OF RESOURCE AVAILABILITY ON THE PROBABILITY OF TIME OVERRUN

Figure 7.1 shows the percentage variation of time overrun due to resource availability. It shows that if the resource availability is very low, then the time overrun is 31%. Similarly, if the resource availability is low, the time overrun is 40.75%; if the resource availability is moderate, the time overrun is 45.50%; if the resource availability is high, the time overrun is 51.30%; and if the resource availability is very high, the time overrun is 58.0%. Hence, the project managers are to give more importance to resource availability during the execution stages to avoid the time overrun of construction projects.
Figure 7.1 Probability of time overrun based on resource availability

7.3 INFLUENCE OF DEFICIENCY IN RESOURCE SUPPLY ON THE PROBABILITY OF THE TIME OVERRUN

Figure 7.2 shows the percentage variation of time overrun due to deficiency in resource supply. It shows that if the resource supply is very low, there is a possibility that the time overrun is 43.7%. Similarly, if the resource supply is low, the time overrun is 44.0%; if the resource supply is moderate, the time overrun is 44.20%; if the resource supply is high, the time overrun is 44.4%; and if the resource supply is very high, the time overrun is 44.60%. This factor does not significantly impact the project duration. Hence, the project managers may give low importance to deficiency in resource supply, during the execution stages.
7.4 INFLUENCE OF LABOUR INVOLVEMENT ON THE PROBABILITY OF THE TIME OVERRUN

Figure 7.3 shows the percentage variation of time overrun and labour involvement. It shows that if the labour involvement is very low, the possibility of the time overrun is 33.75%. Similarly, if the labour involvement is low, the time overrun is 39.25%; if the labour involvement is moderate, the time overrun is 43.75%; if the labour involvement is high, the time overrun is 50.25%; and if the labour involvement is very high, the time overrun is 56.75%. This factor is significant to impact the project duration. Hence, the project managers are to give more importance to labour involvement during the execution stages.
Figure 7.3 Probability of time overrun based on labour involvement

7.5 INFLUENCE OF FINANCIAL ISSUES ON THE PROBABILITY OF THE TIME OVERRUN

Figure 7.4 shows the percentage variation of time overrun and financial Issues. It shows that if the financial issues are very low, there is a possibility that the time overrun is 41.5%. Similarly, if the financial issues are low, the time overrun is 43%; if the financial issues are moderate, the time overrun is 44.50%; if the financial issues are high, the time overrun is 46.00%; if the financial issues are very high, the time overrun is 47.50%. This factor is not significant to impact the project duration. Hence, the project managers are to give low importance to financial issues during the execution stages.
7.6 INFLUENCE OF SHORTAGE OF LABOUR ON THE PROBABILITY OF TIME OVERRUN

Figure 7.5 shows the percentage variation of time overrun and shortage of labour. It shows that if the shortage of labour is very low, the possibility of the time overrun is 21.00%. Similarly, the shortage of labour is low, the time overrun is 33.00%; the shortage of labour is moderate, the time overrun is 45.0%; the shortage of labour is high, the time overrun is 57.00%; and the shortage of labour is very high, the time overrun is 69.00%. This factor is significant to impact the project duration. Hence, the project managers are to give more importance to shortage of labour during the execution stages.
7.7 SUMMARY

The case study is carried out by collecting 27 project details from various types of projects. In this, the project managers are asked to rate the major groups, like manpower, materials, equipment, finance, environment and scheduling and control related issues, as per their project conditions and the percentage of delay is divided into 5 parts, such as Nil, 1-10%, 11-20%, 21-30% and more than 30%. The nil option is given if there is no delay for that particular group; but intentionally that nil option is not used by the respondents. From this we know, that there is some minimum percentage of delay prevailing in all the groups. Then the time overrun index model was formulated from the regression analysis results. The model has strength of about 84.6% in relation to the percentage of time overrun and the dependent variable. Thus, the model developed could predict the expected deviation in advance with more accuracy. By knowing the expected deviation in advance, the planners can prepare the schedule of the project, accommodating the
expected deviation. Major groups like manpower (57.14%), materials (47.14%), scheduling and control related problems (42.86%) have the highest contribution to the construction time overrun; so, these percentages should be taken into consideration during the planning and scheduling process, to minimize the construction time overrun.