

AN ALGORITHM FOR CREATING MASTER SCHEDULES THAT MINIMISES SCHEDULE REORGANISATION RESULTING FROM ADVERSE RISK EVENTS

Steven R. Davis¹

ABSTRACT

Lookahead planning is a process that identifies constraints that need to be removed in order for the activity to proceed. If an activity has constraints that cannot be removed in time for it to start then the activity needs to be rescheduled and work may need to be found for the resources that would otherwise be idle. This may impact many subsequent activities that depend on the delayed activity reducing the reliability of the schedule and potentially extending the project.

This paper presents an algorithm based on a risk model for creating a master schedule for a project arranged to minimise the reorganisation required when delays occur to activities that have some probability of being delayed. The model assumes that the project will be utilising a lookahead process so that it will be recognised ahead of time that a particular activity will be delayed. It also assumes that the probabilities that different activities will be delayed, and an estimate of the amount of warning of each delay that will be given by the lookahead process, can be obtained from risk analysis.

A case study example is presented that highlights the algorithm's effectiveness.

KEY WORDS

Risk management, lookahead process, schedule planning, schedule reorganisation, replanning.

INTRODUCTION

The Last PlannerTM system of production control breaks planning into three levels: initial planning, lookahead planning, and commitment planning. Initial planning produces the overall budget and schedule, lookahead planning ensures that activities will be able to be executed when they should, and commitment planning assigns work tasks to individual work crews (Ballard and Howell, 1998).

It is common on construction projects for events to arise that prevent activities from being carried out when originally scheduled. In the Lean Construction paradigm anything that can prevent an activity from being executed is referred to as a constraint (Hamzeh et al, 2008). Lookahead planning is the process of going through all the constraints for each activity in the period leading up to the scheduled start of that

¹ Lecturer, School of Civil and Environmental Engineering, University of New South Wales, Sydney NSW 2052, Australia, Phone +61 2/9385-5052, FAX 2/9385-6139, s.davis@unsw.edu.au