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e Insights

NAC Executiv

trade productivity), true productivity is associated with activities along the critical path and in complex projects, near critical path activities

Phantom productivity can be seen in both value-based measures of progress as well as in labor-based measures. For example, receipt of equipment and materials at the site from manufacturers and suppliers represents a key progress milestone and is (eipt)-a@d4pbc @@d4pbc

One example is where the critical path calls for completion of mechanical piping and process systems to facilitate plant commissioning and startup. Assume the systems consist of three activities installing the pipe (hanging it); edge prep and pipe cleaning; and welding. Accelerating, say doubling, the rate at which pipe is installed and edges prepped and pipe cleaned would tend to give an indication of overall productivity improvement even while completed systems are still paced by shortages of welders. This is roductivity along the critical path, however, has not improved, not at least

until the constraint is relieved.

Productivity is typically measured in terms of dollars of output (installed cost) divided by either total labor cost or work-hours. This corresponds to measures for overall project productivity and over-reliance on total productivity without a closer examination of unit or critical path productivity. This has been the source of delayed recognition of many failing projects

Labor time (work-hour) measures of labor productivity need to include both productive time (time on tool) and unproductive time. Strategies for improvement exist in each area and segregation of the labor time measures improves the chances for increases in productivity for each.

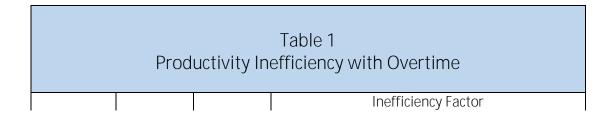
Recurrent Factors Affecting Productivity

Table 2 lists many factors affecting productivity that project, construction management, and construction professionals will recognize. This section takes a closer look at two:

Loss of productivity with overtime Effect of interruption

Loss of productivity with overtime is a regular occurrence in construction. Smilar losses also arise with shift work and work schedules. Table 1 summarizes the loss of productivity with overtime as a function of daily and weekly hours and the duration of the overtime period. Several studies over the years arrive at similar factors, sometimes stating the factors as reciprocals of the numbers shown in Table 1.

Extended overtime schedules and persistence have measurable and significant impacts on construction productivity and underscore why it is critical to identify productivity issues before overtime becomes the solution and the source of claims.



established labor pools will aid in the retention of some knowledge. The duration of disruptions are a key factor here.

Figure 1. Interrupted Production with Serial Learning Ourves

Figure 2 illustrates productivity loss as interruption durations extend. Results from two studies are shown with average productivity loss percentages reaching 40 percent after just three hours and 90 percent destroyed after six hours.



3. External factors include project conditions, government policy and regulations, third-party actions, and labor (Table 2D).

