

Activity	January																		February											
	1	2	3	4	5	8	9	10	11	12	15	16	17	18	19	22	23	24	25	26	29	30	31	1	2	5	6	7		
A	6	6	6	6	6																									
B						2	2	2	2]																				
C						4	4	4	4	4]																				
D						3	3	3	3	3	3]															
E										3	3	3	3	3	3]										
F											2	2	2	2	2	2]														
G											4	4	4	4	4]											
H																3	3	3	3	3	3	3]								
I																4	4	4	4	4]							
J																2	2	2]							
K																									5	5	5	5	5]	
Total	6	6	6	6	6	9	9	9	9	10	8	9	9	9	9	8	9	9	7	7	3	3	3	5	5	5	5	5	5	
(] Late Finish)																														

FIGURE 12.13 Resource-Loading Table for Sample Network When Activity Float is Included

The advantage of developing a detailed resource profile is that it provides a useful visual demonstration of the projected resource requirements needed across the entire project baseline. It is possible to use this resource profile in conjunction with the resource-loading table to develop a strategy for optimal resource leveling.

Step Two: Determine Activity Late Finish Dates

The next step in the resource-leveling process consists of applying the additional information regarding activity slack and late finish dates to the resource-loading table (see Table 12.3). This modified table is shown in Figure 12.13. Note that in this figure, we can identify the activities with slack time and those that are critical (no slack time). The late finish dates for those activities with slack are included and are represented as brackets. Hence, activities B, D, E, G, I, and J are shown with late finish dates corresponding to the slack time associated with each task, while the late finish for the activities along the critical path (A – C – F – H – K) is identical to the activities' early finish dates.

Step Three: Identify Resource Overallocation

After the resource-loading table is completed and all activity late finish dates are embedded, the process of actual resource leveling can begin with an examination of the resource profile for the project. What we are looking for here are any points across the project baseline at which resources have been allocated beyond the maximum resource level available. For example, in Figure 12.13, note that the total resources needed (the summation along the bottom row) reveals the maximum needed for any day of the project falls on January 12, when tasks requiring 10 resource units are scheduled. The question project managers need to consider is whether this resource profile is acceptable or if it indicates trouble, due to an allocation of resources that will not be available. If, for example, the project is budgeted for up to 10 resource units per day, then this resource profile is acceptable. On the other hand, if resources are limited to some figure below the maximum found in the project's resource profile, the project has an overallocation problem that must be addressed and corrected.

Certainly, at this point, the best-case scenario is to discover that resources have been allocated at or below the maximum across the project baseline. Given the nature of both time and resource project constraints, however, it is much more common to find situations of resource conflicts that require leveling. Suppose that in our sample project the maximum number of resource units available on any day is nine. We have already determined that on January 12, the project is scheduled to require 10 units, representing an overallocation. The discovery of overallocations triggers the next step in the resource-leveling process, in which we correct the schedule to eliminate resource conflicts.

Step Four: Level the Resource-Loading Table

Once a determination has been made that the project baseline includes overallocated resources, an iterative process begins in which the resource-loading table is reconfigured to eliminate the resource contention points. The most important point to remember in resource leveling is the