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Chapter 18: Float Risk Analysis

Float risk analysis is an important method of analyzing the performance of available float in the project and or task. In common practice across the globe, project controls professionals tend to look after majorly the critical tasks and longest paths in order to have an eye on project delays, but they overlook the importance of non-critical tasks and paths. It is understood that critical tasks are the top priority to look for and to control, but non-critical tasks can be the one's where the damage can be significant for over all schedule if not monitored or controlled before point of no return.

Every baseline has critical tasks as well as non-critical tasks, and in almost majority of the cases the percent of critical tasks ranges from 10 to 25%, that means significant portion of the baseline schedule is non-critical and if the percentage of critical task in updated schedule is increasing from its baseline values, that means the compromise on non-critical tasks is done which has consumed all of their available float and became critical

From definitions chapter we know that remaining duration % is the percent of remaining duration of the at completion duration. 41% float consumption may not be that harmful as it appears, if the remaining during of each task in the project is minimum or very low, at least not significantly higher than float consumption% let's say on average 40% duration of tasks is remaining in that case we might afford to carry on with the same schedule because we have 59% baseline float available with 40% remaining duration. An important thing to consider is that remaining duration at activity level is an absolute value and at project level it is the sum of all remaining durations of all tasks divided by sum of at completion durations, remaining duration should not be mixed with time remaining. Time remaining is a different metrics which deals with the timeline of the whole project and is the difference between project total duration and time elapsed, this information will be very useful when we will define the level of risk associated with each task based on their remaining duration and float consumption. It is very important to understand that float consumption is a predictive metric that shows how much float is remaining for each task and for the project, it does not show how much delay a project has already been, for that we always need to look towards minimum total float in the schedule.

In order to develop the KPI for expected float consumption, we can use another metric "float performance" which will be a comparison between remaining duration of the task or the project vs expected float consumption, though there is not any specific guideline to establish the threshold limit for flagging the float consumption, but we can develop a reasonable criteria, for example when the project starts we see 100% remaining duration at activity level and project level, 0% time elapsed and 0% float consumption, because in baseline current TF and BLTF are same, so no variance means zero float consumption, knowing this we can set our criteria that, the sum of expected float consumption % and remaining duration % should not exceed 100%, where ever it exceeds, that becomes a concern. Now if we see our float performance as of Update 3, it shows -30.20%, which is the sum of float consumption 41.42% and remaining duration 88.79% subtracted from 100% (to see the variance). This KPI will give us a threshold limit and a reasonable range to keep float consumption withing the limits. In this way, high float consumption values may not be as harmful as they might be thought of previously, or low Float consumption may be more dangerous than what we have assumed. For example, if float consumption in only 10%, while remaining duration is 98%, that means float performance is 8% more than the limit. (98%+10%=108%). It is obvious that we may not modify the remaining duration because it is based on remaining scope in each task, which leaves us to improve/ reduce float consumption % for the remaining scope, and that can be achieved only by not starting and finish tasks later than baseline early dates, scheduler must plan to bring as many late starts and finishes back to execute them on time or earlier

In every schedule there is a certain risk associated, that, whether the schedule will be executed as per the baselines, or it will fail to do so. To predict the expected degree of deviation from the baseline, we need to analyze to which extend the current schedule has differed from baseline and what are the consequences for remaining part of the schedule. From critical path method we know that all the task with less than zero float will be delayed if not controlled or recovered, and the tasks with total float zero will be the quickest to get delayed, so, to predict the degree of risk involved in the remaining tasks we need to calculate the expected float consumption and remaining duration of that task. These two metrics can define the magnitude at which the deviation from the baseline might occur which will eventually predict if the task is expected to finish on or before late dates or after them. Any task that is expected to finish after late dates contains the highest degree of risk.

In baseline every non critical task has some float available, this float may get eroded as we proceed further in the project, the allowable limit to consume the float can not exceed 100%, if your float consumption is 100% that means you will be utilizing all the float, but to understand the risk involved in the task to comply as per baseline dates or breech them, we need to see for how long the task will be open, simple lesser the remaining duration a task have, lesser will be the risk associated with the task. as we have already discussed that, to quantify the level of risk in each task and at project level we need to combine the remaining duration % and float consumption % to get a new KPI called “Float Performance%”, we can use float performance% to set the threshold limit to define level of risks hidden in the schedule. This limit will be the indication for schedulers to have confidence in the schedule, if the forecast shows high float consumption% and higher remaining duration % that simply means more risk in the schedule, lower the values lower the risk.

Before we set the threshold limits for level of risk, we need to recall that, at the baseline time, we have zero% float consumption and 100% remaining duration for both, at task and project level. To comply with baseline and understand float performance our guideline should be baseline as well, let’s look at the equation of Baseline float performance %.

Baseline:

Float performance % = Float consumption % + Remaining Duration % =>> (0% + 100%) =>> **100%**

So, if we are to follow the baseline, we need to use above equation as reference guide to predict level of risk in the schedule. In below table, the float consumption % is varying whereas remaining duration is kept constant, it is obvious that, remaining duration and float consumption can vary at the same time, but for easiness remaining duration % is kept contact as 100%. let's develop level of risk and its criteria.

Level of Risk	Float Consumption %	Remaining Duration %	Float Performance %	Criteria Float Performance %	Color Code
No Risk	10%	100%	110%	100% to 125%	
Low Risk	40%	100%	140%	125% to 150%	
Medium Risk	55%	100%	155%	150% to 175%	
High Risk	100%	100%	200%	175% to 200%	
Sever Risk	101%	100%	201%	>200%	

As we can see from the above table that, only sever risk is the level where all the baseline total float must be consumed, other wise sever risk will not be reached, for example remaining duration is maximum which is 100%, so in order to reach sever risk level, your task or schedule must predict the consumption float to be 100%. Sever risk level can also be achieved with minimum remaining duration, let's say 10% duration is remaining but the float consumption is 190% of the total float. It is obvious that float consumption % can go beyond 100% because the erosion of total float in current schedule can linger on until the completion of task. see the number below to understand this concept.

BL TF 50 days
Current project TF = -150 days
Float consumption % = (50-(-150)/50=>> 200/50 =>> 400%

So, what is the acceptable float risk level in the schedule? Well, we need to try to keep float risk level below medium for 1st half of the project timeline, for example, until the time elapsed reaches 50% we should avoid even the medium risk, and as we go further towards project completion, we may be able to afford medium to high risk in the schedule, only because remaining duration will be minimal, but we can not afford to accept sever risk at any stage of project. Whenever we see risk not meeting above criteria it is advisable to re-evaluate the schedule network logic, perform crashing, re-evaluate duration, and prepare a recovery schedule