ENGINUITY TUTORIAL

Finishing Jobs Correctly

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There are 3 scenarios possible for completing a job :-

- A job **completes early** i.e., at least one period before its planned duration e.g., completing a 5-period job in 4 periods, 4-period job in 3 periods etc
- A job completes **on schedule** in its planned duration
- A job overruns and **completes late**

No matter which scenario applies, in the period a job is completed it is essential to try and complete it as efficiently and profitably as possible.

MAKING Job progression decisions (Labour) for period 5 in the Early Years

Change period   Key information   Help

IDLE LABOUR POOL

START OF THE PERIOD

Number in the idle pool: 132

Number to layoff: 0

Number available for jobs in progress: 132

AFTER DECISIONS

Net transfers: 0

Number left in the idle pool: 132

JOBS IN PROGRESS

						This period		Own Labour	To site		From site			Subcontract Labour				
Job	Country	Sector	Plan Dur	Remaining planned periods	Progress so far	Status	Plan lab	Last per	From ILP	New	To ILP	Paid off	On site	End last	Take on	Lay off	On site	Total
29	UK	Transport	2	FINAL planned period	Ahead of schedule	2nd period	21	20	0	0	0	0	20	0	0	0	0	20
32	US	Building & Commercial	2	FINAL planned period	Ahead of schedule	2nd period	102	22	0	0	0	0	22	70	0	0	[illegible]	92
34	UK	Energy	3	2 planned periods remaining	Ahead of schedule	2nd period	48	34	0	0	0	0	34	0	[illegible]	[illegible]	0	34
49	UK	Water & Sewage	2	2 planned periods remaining		1st period	11	0	0	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	0	0
52	UK	Transport	3	3 planned periods remaining		1st period	95	0	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0
67	SYR	Energy	3	3 planned periods remaining		1st period	9	0	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0

Consider the following example.

Period 5 is the **second period of job 29, and its FINAL planned period**. There are currently 20 labourers on site, all are the company's own labour, and the planned requirement is 21.

Normally, allocating the planned level each period is sufficient to complete a job on time, providing a good project manager has been allocated to oversee the job, and all the labour is fully effective. However, since this is the final planned period of the job we should take a closer look at how the job has progressed to date, since other factors may have contributed to the job being behind or ahead of schedule, and we need to allocate sufficient labour to complete the job as efficiently as possible.

Due to a number of factors the job may be behind/ahead of schedule, and require more/less labour than planned.

We can use the **Display details for job 29** option to investigate further.

Job 29 (In progress)

Management consultants report   Risk analysis

JOB SUMMARY   JOB PROGRESS

Job progression											Profit analysis			
Planned schedule			Actual progress								By period		Cumulative	
Job period	Planned labour	Cumul % complete	Period	Status	Actual labour	Ineffect due to delays	Ineffect due to overman	Effective labour	Actual % complete	Completion status	Profit	Profit % of cost	Cumul profit	Cumul profit % of cost
1	14	40 %	4	Past	20	0.0	0.0	20.0	58.41 %	Ahead of schedule	21,894	3.0 %	21,894	3.0 %
2	21	100 %	5	Current						planned period of the job				

Total planned labour needed to complete the job is 35.

For a Transport job, the effective labour on site (after delays) cannot be more than 45% above the planned labour le

The **Job progress** for the job shows that the job was 58.41% complete at the end of the last period, and ahead of the planned schedule of 40%. There is just **41.59%** of the job left to complete.

The **total planned labour required to complete the job is 35 man periods**. Since there is 41.59% of the job left to complete, in manpower terms this is 41.59% of the total labour of 35, or 14.56 labourers.

14.56 labourers should be sufficient for the job to complete, **BUT there is a key factor that could prevent this from happening, and that is delays caused by risks striking.**

Risks only strike within the planned duration of a job, so risk delays DO NOT need to be considered if a job has over run, and will complete late.

To determine if any risks may delay job the job in its final period we can use the **Risk analysis** option at the top of the screen.

KEY POINTS

There is no need to make an adjustment for risk delays until the period in which the job is likely to finish, as there is time to compensate for delays in earlier periods before a job finishes.

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Risk analysis

COST ANALYSIS | DELAY ANALYSIS

Job details					Risk details			Risk status		Delays	
Job	Status	In	BIM job	Sector	Risk description	Chance	Expected labour reduction	Struck	In period	Affect of Invest	Actual labour reduction
29	In progress	UK	No	TRA	Stakeholders not working together	Low	2.4 %	No			
					Service/utility clashes	Low	7.4 %	No			
					Personnel issues	High	2.4 %	No			

RISK

Likelihood	Chance it hits
High	70 to 80 %
Medium	40 to 50 %
Low	20 to 30 %

The **Risk analysis** for job 29 reveals that there are 3 risks that have not yet struck, and which could delay the job if they were to strike, the delay causing a reduction in the labour on site :-

- ‘Stakeholders not working together’, which has a **‘low’** chance of occurring, and an expected labour reduction of 2.4%
- ‘Service/utility clashes’, which has a **‘low’** chance of occurring, and an expected labour reduction of 7.4%
- ‘Personnel issues’, which has a **‘high’** chance of occurring, and an expected labour reduction of 2.4%

The **Industry parameters** show the chance a risk may strike for each likelihood level.

Although all the risks could strike, and potentially delay the job, **the threat of ‘Personnel issues’ is most likely**, and the Construction Manager decides to take action in case this happens.

Since a 2.4% delay is expected, the required labour level of 14.56 is adjusted in case of the 2.4% delay, giving a revised labour level of 14.92 labourers (14.56 / 0.976). **Since we cannot have fractions of people, the labour level is adjusted upwards to 15 labourers.**

KEY POINTS

Targeted investments on the Financial Decisions Screen into risk management companies can reduce the delays caused when risks strike, and reduce the amount of additional labour added to compensate for potential delays.

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MAKING Job progression decisions (Labour) for period 5 in the Early Years

Change period Key information Help

IDLE LABOUR POOL

START OF THE PERIOD

Number in the idle pool: 132

Number to layoff: 0

Number available for jobs in progress: 132

AFTER DECISIONS

Net transfers: 5

Number left in the idle pool: 137

JOBS IN PROGRESS

						This period		Own Labour						Subcontract Labour				
									To site		From site							
Job	Country	Sector	Plan Dur	Remaining planned periods	Progress so far	Status	Plan lab	Last per	From ILP	New	To ILP	Paid off	On site	End last	Take on	Lay off	On site	Total
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32	US	Building & Commercial	2	FINAL planned period	Ahead of schedule	2nd period	102	22	0	0		0	22	70	0	0	70	92
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49	UK	Water & Sewage	2	2 planned periods remaining		1st period	11	0	0			0	0	0	0	0	0	0
52	UK	Transport	3	3 planned periods remaining		1st period	95	0	0				0	0	0	0	0	0
67	SYR	Energy	3	3 planned periods remaining		1st period	9	0					0	0	0	0	0	0

We have now determined that **15 labourers** should be enough on job 29 to complete it as efficiently as possible in period 5.

The planned allocation is 21 labourers, which although guaranteeing to complete the job, would complete the job too early in the period, which would have had the following detrimental affects :-

- Labour is still retained until the end of the period, incurring additional labour costs (ineffective labour)
- Labour could be utilised on other jobs, where it may be more productively used
- Site cost still has to be paid for ineffective labour