

# INGENUITY TUTORIAL



## Completing A Job That Overruns



## Completing a Job that Overruns

Ideally all jobs progressed will be completed either early or on time.

However, this is not always the case, and if a job overruns beyond its planned duration there are a number of affects :-

- A **penalty** will be incurred from the client for late completion, expressed as a % of the tender value for each period the job overruns. This can have a severe affect on the company's cash account, and company value.
- Additional **resources will be needed** to complete the job (labour, project manager), diverting them from elsewhere.
- It **reflects badly** on the industry's perception of the company, reflected in the 'contract completion' and 'client satisfaction' key performance indicators used to measure the progress of the company.

**If a job overruns, it is imperative that the Construction Manager allocates enough labour to complete the job in its first overrunning period.**



# Completing a Job that Overruns

MAKING Job progression decisions (Labour) for period 10 in the Early Years

Change period Key information Help

### IDLE LABOUR POOL

#### START OF THE PERIOD

Number in the idle pool: 5

Number to layoff: 0

Number available for jobs in progress: 5

#### AFTER DECISIONS

Net transfers: 0

Number left in the idle pool: 5

### JOBS IN PROGRESS

| Job | Country | Sector                | Plan Dur | Remaining planned periods   | Progress so far   | Status     | Plan lab | Own Labour |          |     |           |          | Subcontract Labour |          |         |         | Total |         |     |
|-----|---------|-----------------------|----------|-----------------------------|-------------------|------------|----------|------------|----------|-----|-----------|----------|--------------------|----------|---------|---------|-------|---------|-----|
|     |         |                       |          |                             |                   |            |          | Last per   | To site  |     | From site |          | On site            | End last | Take on | Lay off |       | On site |     |
|     |         |                       |          |                             |                   |            |          |            | From ILP | New | To ILP    | Paid off |                    |          |         |         |       |         |     |
| 110 | UAE     | Energy                | 3        | OVERRUN by 1 periods        | Behind schedule   | 4th period | Over     | 23         | 0        | 0   | 0         | 0        | 0                  | 23       | 0       | 0       | 0     | 0       | 23  |
| 118 | UK      | Building & Commercial | 4        | FINAL planned period        | Ahead of schedule | 4th period | 37       | 76         | 0        | 0   | 0         | 0        | 76                 | 0        | 0       | 0       | 0     | 0       | 76  |
| 137 | UK      | Water & Sewage        | 3        | FINAL planned period        | Behind schedule   | 3rd period | 41       | 104        | 0        | 0   | 0         | 0        | 104                | 0        | 0       | 0       | 0     | 0       | 104 |
| 167 | US      | Energy                | 3        | 2 planned periods remaining | Behind schedule   | 2nd period | 77       | 46         | 0        | 0   | 0         | 0        | 46                 | 0        | 0       | 0       | 0     | 0       | 46  |
| 181 | UK      | Water & Sewage        | 3        | 2 planned periods remaining | Ahead of schedule | 2nd period | 59       | 35         | 0        | 0   | 0         | 0        | 35                 | 0        | 0       | 0       | 0     | 0       | 35  |
| 192 | UK      | Building & Commercial | 4        | 4 planned periods remaining |                   |            | 61       | 0          | 0        | 0   | 0         | 0        | 0                  | 0        | 0       | 0       | 0     | 0       | 0   |

Display details for job 110

Consider the following example.

Job 110, planned to be a 3 period job, has **overrun** into its 4th period.

There are currently 23 of the company's own labour on site, but with no planned labour as a guide, **what level of labour is required to complete the job this period ?**



# Completing a Job that Overruns

Job 110 (In progress)

Management consultants report Risk analysis

## JOB SUMMARY

## JOB PROGRESS

| Planned schedule |                |                  | Job progression |         |               |                        |                         |                  |                   |                                 | Profit analysis |                  |              |                        |
|------------------|----------------|------------------|-----------------|---------|---------------|------------------------|-------------------------|------------------|-------------------|---------------------------------|-----------------|------------------|--------------|------------------------|
| Job period       | Planned labour | Cumul % complete | Actual progress |         |               |                        |                         |                  |                   |                                 | By period       |                  | Cumulative   |                        |
|                  |                |                  | 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                | 43             | 30 %             | 7               | Past    | 43            | 0.8                    | 0.0                     | 42.2             | 29.93 %           | Behind schedule                 | 239,238         | 7.4 %            | 239,238      | 7.4 %                  |
| 2                | 72             | 80 %             | 8               | Past    | 73            | 0.0                    | 0.0                     | 73.0             | 81.56 %           | Ahead of schedule               | 493,179         | 9.0 %            | 732,417      | 8.4 %                  |
| 3                | 29             | 100 %            | 9               | Past    | 23            | 0.0                    | 0.0                     | 23.0             | 97.91 %           | Behind schedule                 | 167,566         | 9.7 %            | 899,983      | 8.6 %                  |
|                  |                |                  | 10              | Current |               |                        |                         |                  |                   | OVERRUN, and will complete late |                 |                  |              |                        |

Total planned labour needed to complete the job is 144.

The **Job progress** for the job shows that the job is currently 97.91% complete, and has overrun.

There is 2.09% of the job left to complete, or 2.09% of the total labour required for the job, 144 man periods, equating to 3 labourers ( $.0209 \times 144$ ).

**Delays caused by risks striking are not an issue when jobs overrun, since risks will only strike during the planned duration of a job.**

To ensure that the job completes 3 labourers should be allocated to the job.

**If a job overruns you can allocate as much labour as is required to complete the job, and the normal overmanning rules do not apply, since there is no planned labour as a guide.**

# Completing a Job that Overruns

Job 110 (Completed late)

Navigate to "Main menu/Measuring performance/Assessing performance/Job performance"

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 |
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| 3                | 29             | 100 %            | 9               | Past   | 23            | 0.0                    | 0.0                     | 23.0             | 97.91 %           | Behind schedule   | 167,566         | 9.7 %            | 899,983      | 8.6 %                  |
|                  |                |                  | 10              | Past   | 3             | 0.0                    | 0.0                     | 3.0              | 100 %             | Completed late    | -194,824        | -44.6 %          | 705,159      | 6.5 %                  |

Once the period has been completed, the **Job details** shows the penalty incurred for late completion.

The penalty for completing a job late is a % of the overall tender (bid) value to be paid each period the job overruns, and varies by client.

### VIEW THE DETAILS FOR EACH PERIOD THE JOB HAS BEEN PROGRESSED

#### VALUE AND PROFIT ANALYSIS

|                         |          |                           |
|-------------------------|----------|---------------------------|
| Measured value:         | 241,951  | ?                         |
| Early completion bonus: | 0        |                           |
| Total value:            | 241,951  |                           |
| Total cost:             | 436,775  |                           |
| Total profit:           | -194,824 | <b>(-44.6 % of costs)</b> |

#### PROGRESS TO DATE

|                              |                   |
|------------------------------|-------------------|
| Amount of the job completed: | 100 %             |
| Progress comment:            | (Late completion) |

Effective labour limit (ELL): n/a

#### LABOUR ALLOCATED

|                               |                 |
|-------------------------------|-----------------|
| Own:                          | 3               |
| Sub:                          | 0               |
| Total labour allocated:       | 3               |
| (less) labour lost by delays: | 0 (ineffective) |

|                          |         |   |
|--------------------------|---------|---|
| Site cost:               | 181,532 | ? |
| Risk cost:               | 44,961  | ? |
| Late completion penalty: | 0       |   |
|                          | 196,945 |   |

#### ADDITIONAL LABOUR COSTS

|   |     |
|---|-----|
| Ineffective labour due to overmanning:        | 0   |
| Ineffective labour due to completing the job: | 337 |

## Client information

[R]

[ALL]

[ALL]

| Name                       | Base country         | Type           | Current relationship | Procurement restrictions |   | Payment terms |                         |                        |
|----------------------------|----------------------|----------------|----------------------|--------------------------|---|---------------|-------------------------|------------------------|
|                            |                      |                |                      | From period              | Minimum relationship required to continue bidding | Retention     | Late completion penalty | Early completion bonus |
| AeroPower                  | United States        | Private sector | satisfactory         |                          | no restriction                                    | 1.0 %         | 1.2 %                   | 0.4 %                  |
| Al Mahran Developments     | United Arab Emirates | Private sector | No relationship      |                          | no restriction                                    | 1.0 %         | 1.2 %                   | 0.4 %                  |
| American Steel Corporation | United States        | Private sector | satisfactory         |                          | no restriction                                    | 1.0 %         | 1.2 %                   | 0.4 %                  |
| Amrail                     | United States        | Public sector  | satisfactory         |                          | no restriction                                    | 1.0 %         | 1.2 %                   | 0.4 %                  |
| ANZ Water                  | New Zealand          | Private sector | satisfactory         |                          | no restriction                                    | 1.2 %         | 1.3 %                   | 0.5 %                  |
| Auckland City Developments | New Zealand          | Private sector | satisfactory         |                          | no restriction                                    | 1.0 %         | 1.2 %                   | 0.4 %                  |

# Completing a Job that Overruns

## Job 110 (Completed late)

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                | 43             | 30 %             | 7               | Past   | 43            | 0.8                    | 0.0                     | 42.2             | 29.93 %           | Behind schedule   | 239,238  | 7.4 %            | 239,238      | 7.4 %                  |  |
| 2                | 72             | 80 %             | 8               | Past   | 73            | 0.0                    | 0.0                     | 73.0             | 81.56 %           | Ahead of schedule | 493,179  | 9.0 %            | 732,417      | 8.4 %                  |  |
| 3                | 29             | 100 %            | 9               | Past   | 23            | 0.0                    | 0.0                     | 23.0             | 97.91 %           | Behind schedule   | 167,566  | 9.7 %            | 899,983      | 8.6 %                  |  |
|                  |                |                  | 10              | Past   | 23            | 0.0                    | 0.0                     | 23.0             | 100 %             | Completed late    | -549,835 | -69.4 %          | 350,148      | 3.1 %                  |  |

Total planned labour needed to complete the job is 144.

### PERIOD 10

CLICK ON A LINE IN THE THE SUMMARY ABOVE TO SHOW THE DETAILS FOR EACH PERIOD THE JOB HAS BEEN PROGRESSED

| LABOUR ANALYSIS   | COST ANALYSIS   | VALUE AND PROFIT ANALYSIS   |
|---|---|---|
| <b>PLANNED SCHEDULE</b><br>Required labour: n/a<br>Overmanning of: n/a % permitted<br>Effective labour limit (ELL): n/a<br><br><b>LABOUR ALLOCATED</b><br>Own: 23<br>Sub: 0<br>Total labour allocated: 23<br>(less) labour lost by delays: 0 (ineffective)<br>Effective level after delays: 23.0<br>(less) overmanning above the ELL: 0 (ineffective)<br>Effective labour on site: 23 | <b>BUILD RELATED</b><br>Build cost: 181,779 ?<br>Site cost: 287,247 ?<br>Risk cost: 0<br>Late completion penalty: 196,945<br><br><b>ADDITIONAL LABOUR COSTS</b><br>Ineffective labour due to overmanning: 0<br>Ineffective labour due to completing the job: 112,815 ?<br>Training new recruits (Own):<br>Labour payoffs (Own):<br>Subcontractor cost:<br><br><b>PROJECT MANAGER</b><br>Allocated: Ron Garv<br>Overall performance: excellent | Measured value: 241,951 ?<br>Early completion bonus: 0<br>Total value: 241,951<br>Total cost: 791,786<br>Total profit: -549,835 [-69.4 % of costs]<br><br><b>PROGRESS TO DATE</b><br>Amount of the job completed: 100 %<br>Progress comment: <b>(Late completing)</b><br>Cumulative profit: 350,148 [3.1 % of costs]<br>Completion ratio: 0.128 |

If the planned level of 23 labourers had been allocated, the **job would have completed very early in the period**, as shown by the completion ratio of 0.128 (the nearer to 1 the more efficient the job completion), with :-

- A **massive increase in costs** as labour was retained until the end of period, incurring 112,815 additional labour costs
- A significant amount of **unnecessary site cost** with the unnecessary additional labour
- **Inefficient use** of labour that could have been used elsewhere