

	Case Name: Sports Center Tielt	Sector	Construction (Civil)
	OR-AS Operations Research - Applications and Solutions www.or-as.be info@or-as.be	Baseline Schedule	Schedule with resources Schedule with costs
Submitted by	Lise Braeckman	Risk Analysis	Random simulation One of nine std. scenarios User defined distributions
Date	December 21, 2011		Project Control
File Name	C2011-08 Sports Center Tielt.p2x		

1. Project description

Project authenticity

The expansion of a sports center in Tielt (Belgium), more specifically, the reconstruction of the surrounding area in order to match the new requirements.

The project consists of activity and cost data that were obtained directly from the actual project owner and resource data that were created by the user.

2. Project properties

2.1. Baseline Schedule

General	
# Activities	26
Planned Duration (PD)	72 days*
Budget At Completion (BAC)	254.564 €
Renewable Resources	1
Consumable Resources	-

* standard eight-hour working days

Network topology	
Serial/Parallel (SP)	56%
Activity Distribution (AD)	71%
Length of Arcs (LA)	10%
Topological Float (TF)	60%

2.2. Risk Analysis

Random simulation by ProTrack was performed using the default symmetric triangular risk distribution profiles.

	Cost sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	16.5	15.6	1.8
CRI-rho	18.4	13.7	1.7
CRI-tau	21.0	11.2	-0.2

	Resource sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	0.0	0.0	N/A
CRI-rho	100.0	0.0	N/A
CRI-tau	99.0	0.0	N/A

	Time sensitivity		
	avg [%]	std dev [%]	skew [-]
CI	58.9	47.3	-0.4
SI	13.4	28.9	2.3
SSI	11.0	14.9	1.6
CRI-r	16.8	15.7	1.7
CRI-rho	19.0	14.0	1.6
CRI-tau	21.3	11.4	0.4

2.3. Project Control

2.3.1. Simulated forecasting accuracy

The accuracy of time and cost forecasting methods has been evaluated based on Monte Carlo simulation runs using the risk profiles described in section “2.2. Risk Analysis”. Based on these risk profiles, the Mean Absolute Percentage Error (MAPE) and Mean Percentage Error (MPE) has been calculated to evaluate the expected accuracy of the time and cost predictions, EAC(t) and EAC, respectively.

Simulated EAC(t) accuracy		
method - PF	MAPE [%]	MPE [%]
PV - 1	2.7	0.0
PV - SPI	3.4	0.8
PV - SCI	3.3	1.1
ED - 1	2.6	0.0
ED - SPI	3.4	0.8
ED - SCI	3.3	0.9
ES - 1	1.8	-0.1
ES - SPI(t)	2.8	0.8
ES - SCI(t)	3.1	0.9

Simulated EAC accuracy		
method (PF)	MAPE [%]	MPE [%]
1	0.2	0.0
CPI	0.4	0.0
SPI	1.2	0.7
SPI(t)	1.6	0.7
SCI	1.5	0.8
SCI(t)	1.9	0.7
0.8 CPI + 0.2 SPI	0.6	0.2
0.8 CPI + 0.2 SPI(t)	0.6	0.2

According to the MAPE values¹ the best performance for time forecasting can be expected from the unweighted Earned Schedule method. For cost forecasting the unweighted and CPI-weighted methods, or even the two methods using a composite performance factor, should yield the best results.

2.3.2. Tracking description

The user has not performed any project control and therefore no tracking periods have been defined. Tracking periods can now be generated automatically by ProTrack or by manually inputting tracking data period by period.

¹ The MAPE gives the best indication for the forecast accuracy (the lower the MAPE, the more accurate the method) since all deviations from the targeted real duration (real cost) are cumulated, whereas for the MPE underestimates can be compensated by overestimates and vice versa, possibly leading to an overly positive evaluation of a certain method. However, the MPE can provide useful information about the nature of the deviations, i.e. does the method rather underestimate or overestimate the real duration (real cost)?