

# Schedule Quality



Bombardier Transportation – Rail Control Solutions,  
2011.03.01, Jeremy Clarke

**BOMBARDIER**

# Scheduling in BT Division RCS

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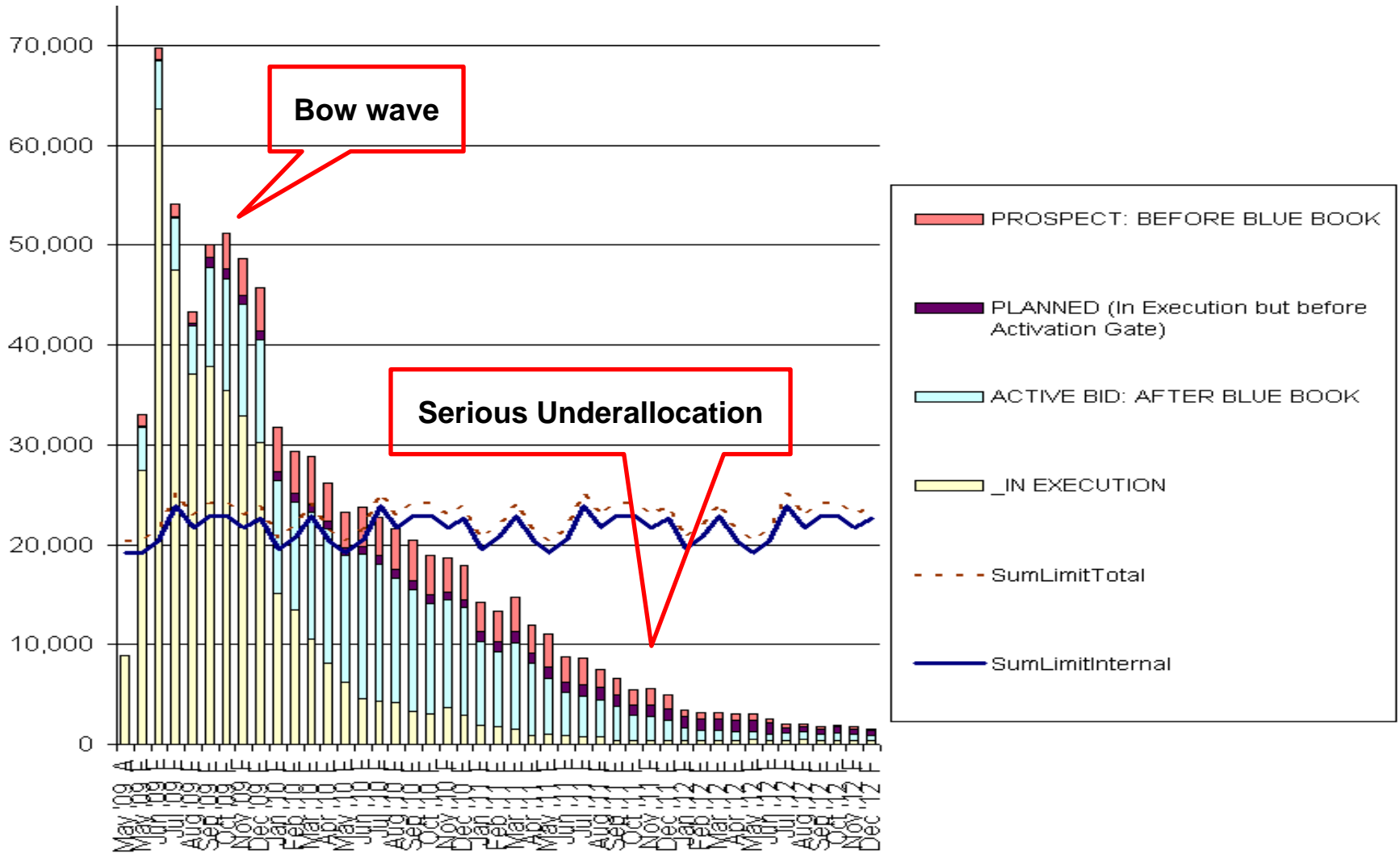
- **2000 Users (300 PM)**
- **Timebooking directly in projects**
- **700-800 active projects**
- **Many exported directly from ERP systems at start of implementation**
  
- **Primavera P6 v6.2.1 (official)**
- **MS Project (unofficial)**
- **Excel, Visio, Powerpoint...**

# Why is Schedule Quality important?

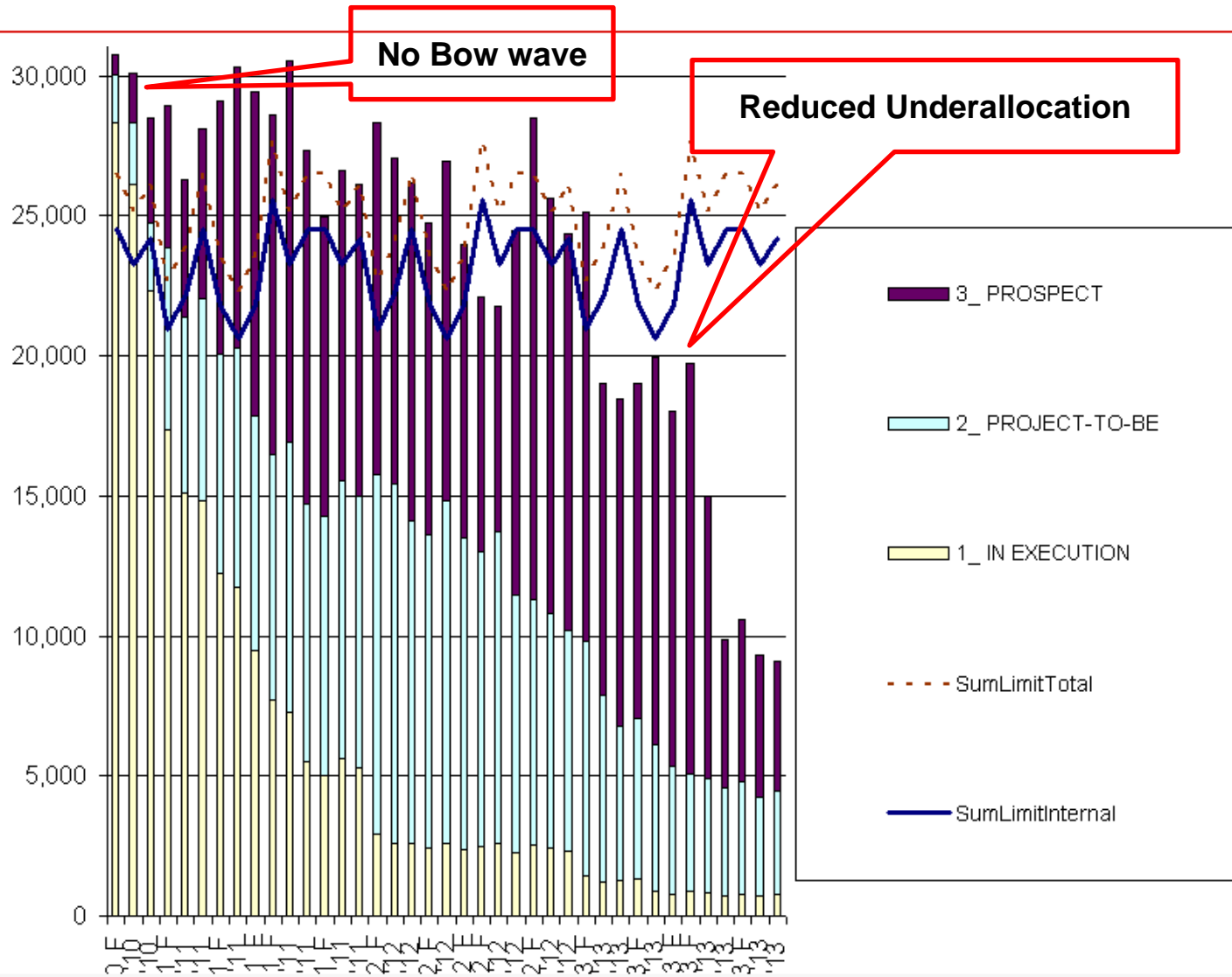
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- **Resource capacity planning**
- **QSRA**

# Resource Planning May 2009 (2.5 Year Horizon)

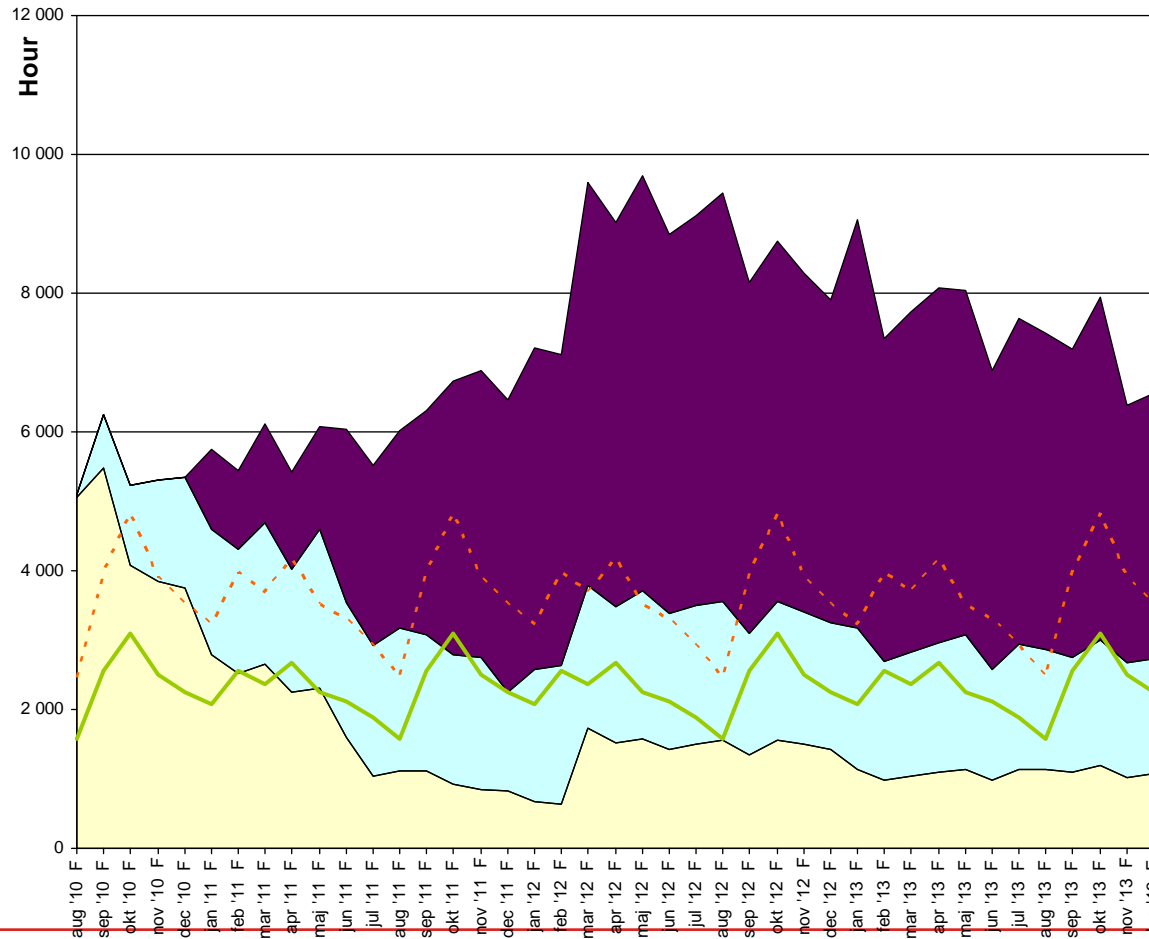


# Resource Planning Dec 2010 (2.5 Year Horizon)



# Decisions now being based on Resource Planning

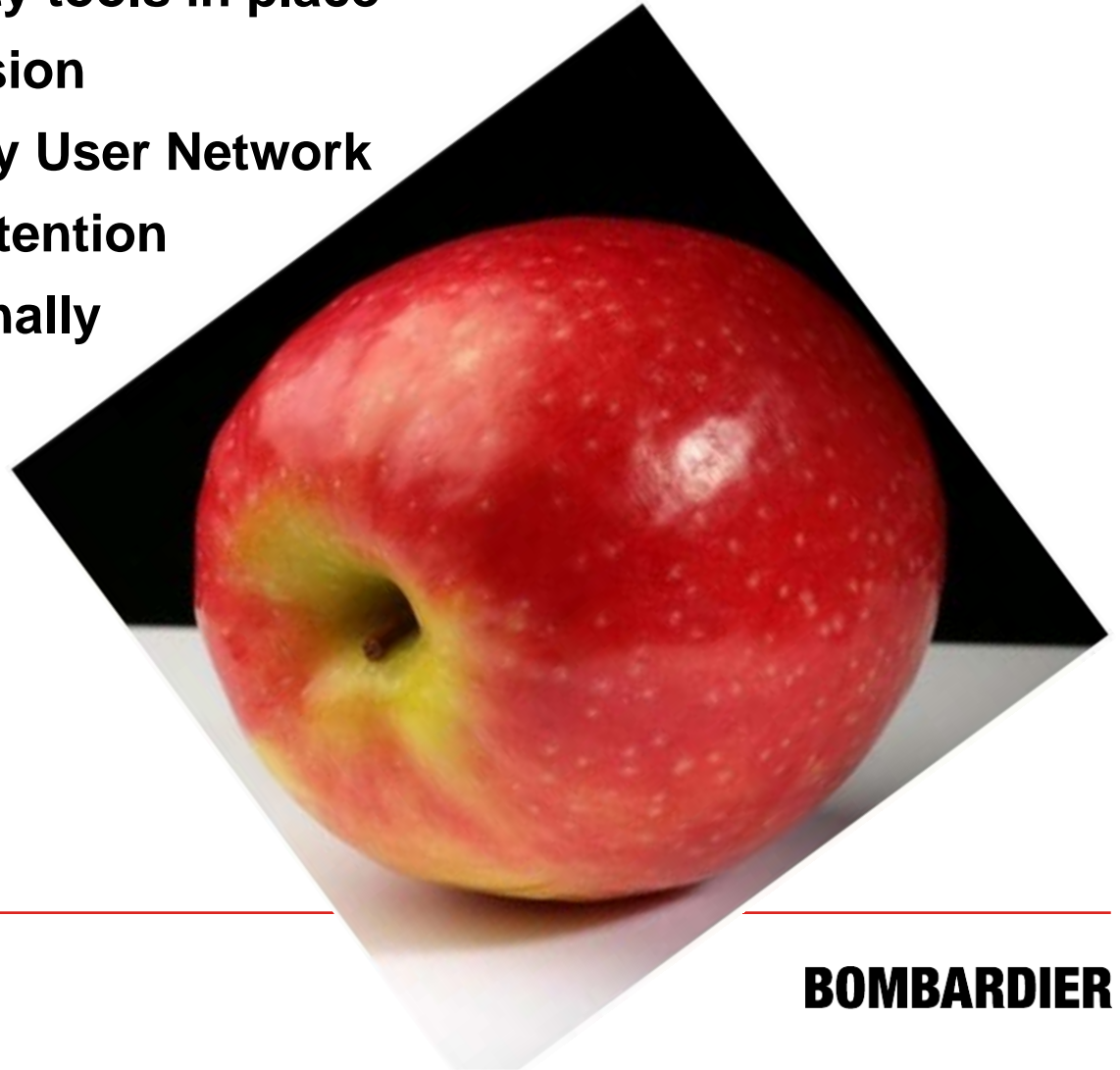
- „Onboard Engineering stays in SE but 2012 demand indicates it needs to double in size“.



# We think we're doing OK...

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- **Rolls Royce of tools**
- **Reporting and 3rd Party tools in place**
- **Skills available in Division**
- **Active and capable Key User Network**
- **Senior Management attention**
- **Good reputation externally**



# ...But what if the underlying schedule quality is sub-standard?

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# True Maturity requires Quality – Schedule Quality

	Standardization & Reengineering (IND244, IND249, Transition Point)	Variance / Critical Path (IND290, IND288)	Portfolio, Inter-Project Linking	PMO / Planner / PM resource and skill level, training in Region		Budget / Forecasting	EVA, Milestone Trend Analysis	Resource Analysis & Management	Risk Management in scheduler		
Weight	0.25	0.25	0.25	0.25		0.25	0.25	0.25	0.25	Weight	
5	Optimized	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	None from standard MBB controls or issues and no major reduction level in schedule	Outstanding
4.5	Managed	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Quality
4	Managed	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Quality
3.5	Defined	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Fair
3	Defined	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Fair
2	Initial	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Poor
1	Sub-Optimal	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Nil MBB > PMB controls or issues and no major reduction level in schedule	Inadequate
Rating per	0	0	0	0		0	0	0	0	Rating per	

# Current Schedule Health Check

Project ID	22000SG-SP10955 new		55	100
Project Name	SP.10955 - RCS HSP 250.I			
Date Reviewed	25/01/2010 22:57			
Actual Start (from project dates tab)	01/04/2004			
Finish (from project dates tab)	22/08/2013 17:00			
Baseline Finish (Project Baseline)	22/08/2013 17:00			
Variance Baseline / Finish Date	0			
Budgeted Hours (Project Baseline)	14698			
Actual Hours	4540.79			
Remaining Hours	10175			
At Completion Hours	14715.79			
Variance BL / At Completion Hours	-17.79			
Critical Path plausible?	See screenshot next sheet		0	25
% Activities with no Predecessor	4%	< 10% = G, 10-25% = Y, > 25% = R	15	15
% Activities with no Successor	6%	< 10% = G, 10-25% = Y, > 25% = R	15	15
% Activities with Constraints	8%	< 10% = G, 10-25% = Y, > 25% = R	15	15
% Activities in Progress	5%			
% Activities Finished	51%			
Standard WBS?	N		0	5
All Budget, Roles, Resources at SP level or lower?	Not valid		0	5
Project Baseline?	Y		5	5
Updated in last month?	N	WBS Milestones in use? MANUAL ENTRY	0	5
Project contains actual hours for previous month?	N	Role / Resource Transition in use? MANUAL ENTRY	0	5
All Activities with Budget have either Resource or P	Y		5	5

# Parameters which are scored

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- **Standard WBS**
- **Resource Planning at right level (ARIS Sub-Process)**
- **Critical path plausible**
  - (subjective, how to assess automatically?)
- **Open Ends (no PRE, no SUCC)**
  - Problem with WBS summaries
- **Hard Constraints**
- **Schedule baselined**
- **WBS Milestones in use**
- **Role / Resource transition in use**



Sample



Multi-Project

# Criteria for Critical Path

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- Path starts with a constrained milestone or activity, not at project start or data date
- Path contains very long activities or summary activities
- Path contains irrelevant activities (such as PM, Monthly Progress Meetings etc)
- Path does not lead to project end or a significant milestone
- More than 10% of Activities have no PRE
- More than 10% of Activities have no SUCC
- Activities on path are not well defined (action clearly described)

# Other Parameters

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## Not scored for now

- **Variance against Baseline dates (not yet in use)**
- **Variance against Baseline budget (not yet in use)**
- **% Activities in progress**
- **% Activities finished**

## No longer used

- **Project updated in last month**
- **Project contains actual hours for last month**

# Plans for 2011

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- **Include 9 points from DCMA**
- **Make Auto Schedule Health Check available to all users via Client through Citrix**
- **Review PMBOK and other standards (US 880 / 881) for additional input**

# The DCMA 14 Point Schedule Assessment

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- **Developed by DCMA**
  - Defense Contract Management Agency (US)
- **Fast becoming an established standard**
- **14 separate checks run against CPM project schedules**
- **Assess quality and structure**
- **Focus on integrity**
- **Touch on performance during execution**

# DCMA 14 Point Assessment Metrics, summary

Metric	What it is	Goal
Logic	Predecessors and Successors	1 ea. task
Leads	Overlap/Concurrency between tasks (negative lag)	0
Lags	Delay between linked tasks	$\leq 5\%$
Relationship Types	Other than Finish to Start (FS)	$\geq 90\%$
Hard Constraints	Must start or finish & no later than	$\leq 5\%$
High Float	Float > 2 months	$\leq 5\%$
Negative Float	Float < 0 days	0
High Duration	Tasks > 2 months	$\leq 5\%$
Invalid Dates	<u>Forecast dates prior to or actual dates after</u> current status date	0
Resources	Hours/Dollars for each tasks	All resource loaded
Missed Tasks	Negative completion variance	$\leq 5\%$
Critical Path Test	Broken logic due to missing dependencies	No large neg. float
Critical Path Length Index (CPLI)	$\frac{\text{Critical Path Length} + \text{Total Float}}{\text{Critical Path Length}}$	$\geq 1.00$
Baseline Execution Index (BEI)	Ratio of completed tasks to tasks planned to be complete	$\geq 1.00$





# 2012?: Primavera P6 v8

Schedule Check Report created on 03-jan-11 04:01 em

## Projects checked

Project ID	Project Description	Data Date	Total Activities	Complete Activities	Total Links
EC00610	Harbour Pointe Assisted Living Center	01-maj-11 12:00 fm	131	18	212

## Projects checked have links to the following Closed Projects

None found

## Check Summary

Check	Description	Target	Actual	Found	Total
Logic	Activities missing predecessors or successors	< 5%	1%	1	113
Negative Lags	Relationships with a lag duration of less than 0	< 1%	12%	24	200
Positive Lags	Relationships with a positive lag duration	< 5%	13%	25	200
Long Lags	Relationships with a lag duration greater than 352 hours	< 5%	1%	1	200
Relationship Types	The majority of relationships should be Finish to Start	> 90%	35%	170	200
Hard Constraints	Constraints that prevent activities being moved	< 1%	0%	0	113
Soft Constraints	Constraints that do not prevent activities being moved	< 5%	4%	4	113
Large Float	Activities with total float greater than 352 hours	< 1%	76%	86	113
Negative Float	Activities with a total float less than 0	< 1%	0%	0	113
Large Durations	Activities that have a remaining duration greater than 352 hours	< 5%	46%	46	101
Invalid Progress Dates (before the data date)	Incomplete activities before the data date	< 1%	0%	0	113

V8 Check