5 Control Worksheets

Chapter 5 consists of 24 exercises: 2 Roundtable, 6 Class, 13 Team, 3 Simulation

5.1.1 Project Control Worksheet

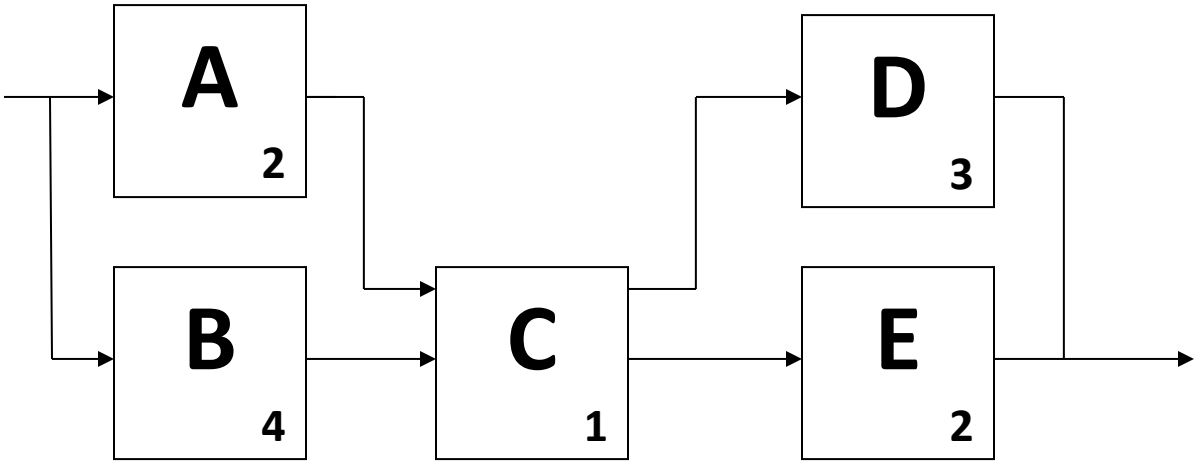
Team 1 - Ideas to Correct Negative Time Variances		
Idea Description	Impact	
	Cost	Scope

Team 2 - Ideas to Correct Negative Cost Variances		
Idea Description	Impact	
	Time	Scope

Team 3 - Ideas to Correct Negative Scope Variances		
Idea Description	Impact	
	Time	Cost

5.2.1 Forward and Reverse Pass Worksheet

Part A: Using PDM Network Diagram



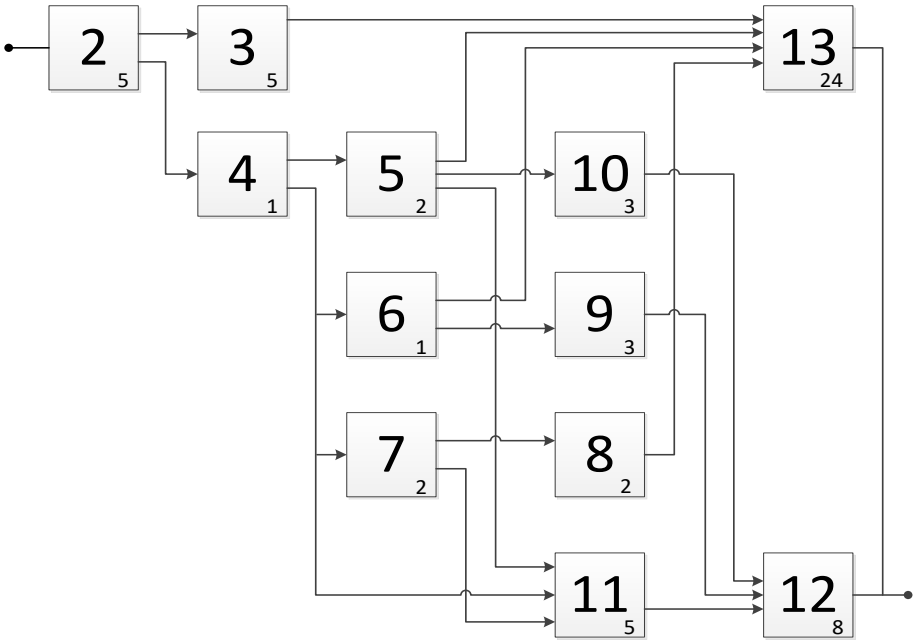
Part B: Using Data Table

Act.	Immed. Pred.	Est. Time	Earliest		Latest		Float	Critical Path
			ES	EF	LS	LF		
A	-	2						
B	-	4						
C	A,B	1						
D	C	3						
E	C	2						

5.2.2 Kitchen Replacement Critical Path Worksheets

Team 1 - Design Procure Critical Path Worksheet

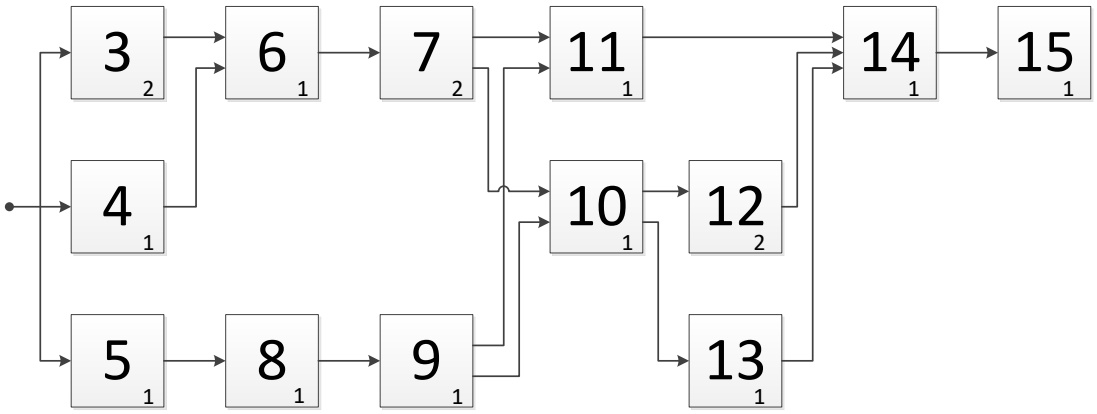
DESIGN PROCURE PHASE



ID	Task	Predecessor	Duration	Earliest		Latest		Float	CP
				ES	EF	LS	LF		
0	**Kitchen Project**								
1	**Design/Procure**								
2	Concept Design		5						
3	Order Appliances	2	5						
4	Layout Design	2	1						
5	Order Flr tile, sink, Disp.	4	2						
6	Order Cupboard/top	4	1						
7	Electrical Design	4	2						
8	Order Electrical Fixtures	7	2						
9	Contract Cupb. Install	6	3						
10	Contract Tile Install	5	3						
11	Contract	4,5,7	5						
12	Secure required permits	9,10,11	8						
13	Deliver Materials ordered	3,5,6,8	24						
14	**Tear Out/ Prep**								
15	**Install**								
16	**Close**								

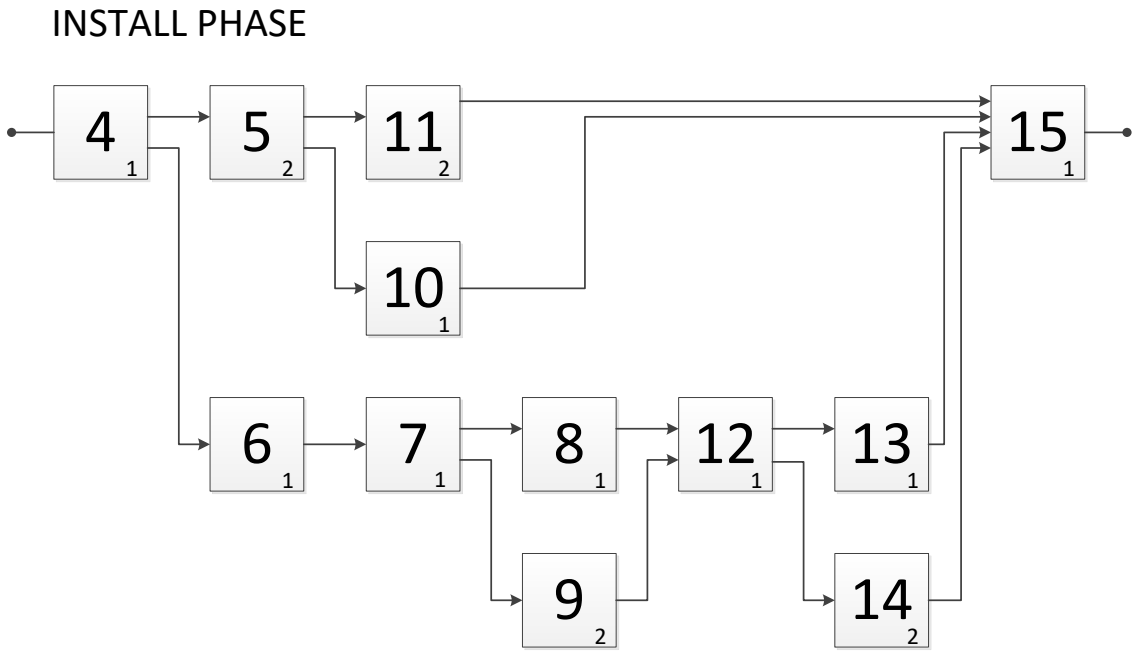
Team 2 - Tear Out Prep Critical Path Worksheet

TEAR OUT PREP CRITICAL PATH



ID	Task	Predecessor	Duration	Earliest		Latest		Float	CP
				ES	EF	LS	LF		
0	**Kitchen Project**								
1	**Design/Procure**								
2	**Tear Out/ Prep**								
3	Remove Burners		2						
4	Remove Sink/Faucet		1						
5	Disc & Remove oven		1						
6	Remove Countertop	3,4	1						
7	Remove Lower Cab.	6	2						
8	Remove Upper Cab.	5	1						
9	Remove Soffett	8	1						
10	Remove Drywall	7,9	1						
11	Remove Floor Tile	7,9	1						
12	Rough in Electrical	10	2						
13	Rough in Plumbing	10	1						
14	Install new Drywall	11,12,13	1						
15	Paint	14	1						
16	**Install**								
17	**Close**								

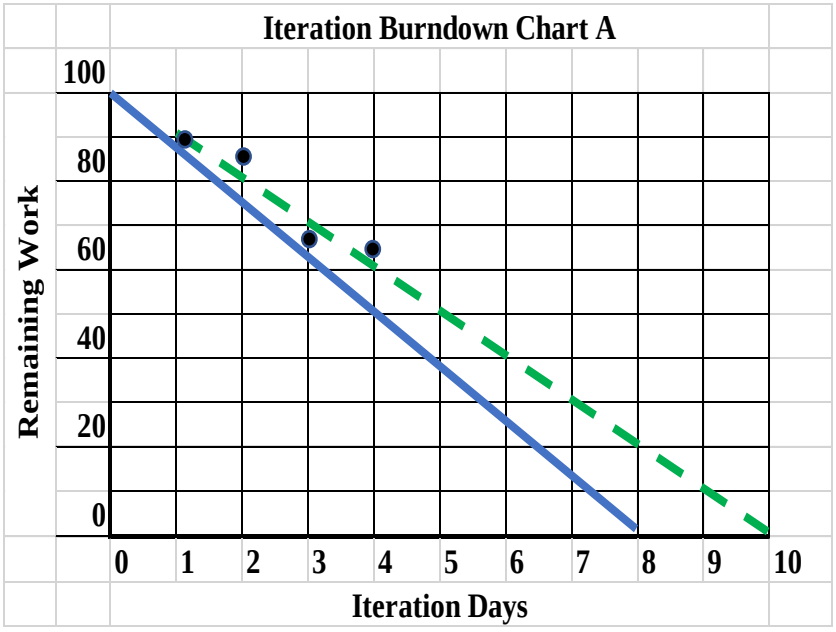
Team 3 - Install Critical Path Worksheet

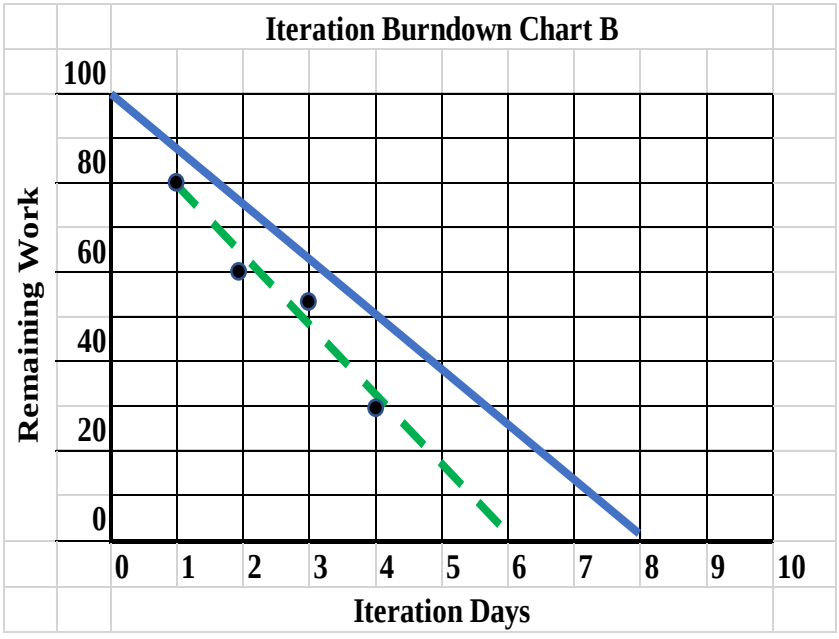


ID	Task	Predecessor	Duration	Earliest		Latest		Float	CP
				ES	EF	LS	LF		
0	**Kitchen Project**								
1	**Design/Procure**								
2	**Tear Out/ Prep**								
3	**Install**								
4	Finish Electrical Outlets		1						
5	Install Upper Cabinets	4	2						
6	Install Lower Cabinets	4	1						
7	Install Countertop	6	1						
8	Install Sink w/disposal	7	1						
9	Install Dishwasher	7	2						
10	Install Light w/fan	5	1						
11	Install Microwave	5	2						
12	Install new Floor Tile	8,9	1						
13	Install Stove	12	1						
14	Finish Trim	12	2						
15	Paint Trim & Touch Up	10,11,13,14	1						
16	**Close**								

5.2.3 Burndown Chart Worksheet

Burndown Chart Worksheet





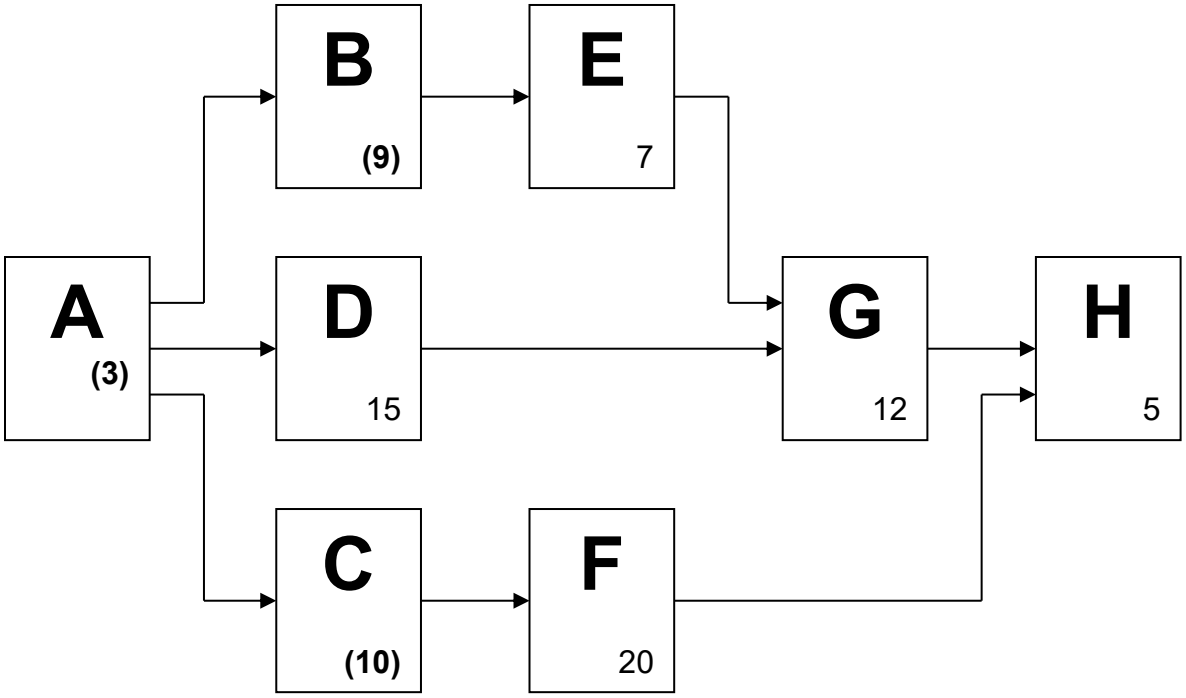
1 What is the planned duration for iterations A and B? ____

2 Which chart is ahead of schedule and what is the expected finish? ___, ___

3 Which chart is behind schedule and what is the expected finish? ___, ___

5.3.1 Crash Cost Worksheet

Network: Activities A, B and C are completed and durations are in parentheses.



The crash times for D, E, F, G and H are given in the table below. Assume a linear relationship between estimated times and crash times to compute and record the missing data in the following two charts. The cost to complete activities A, B, and C was $25000.

Data Table

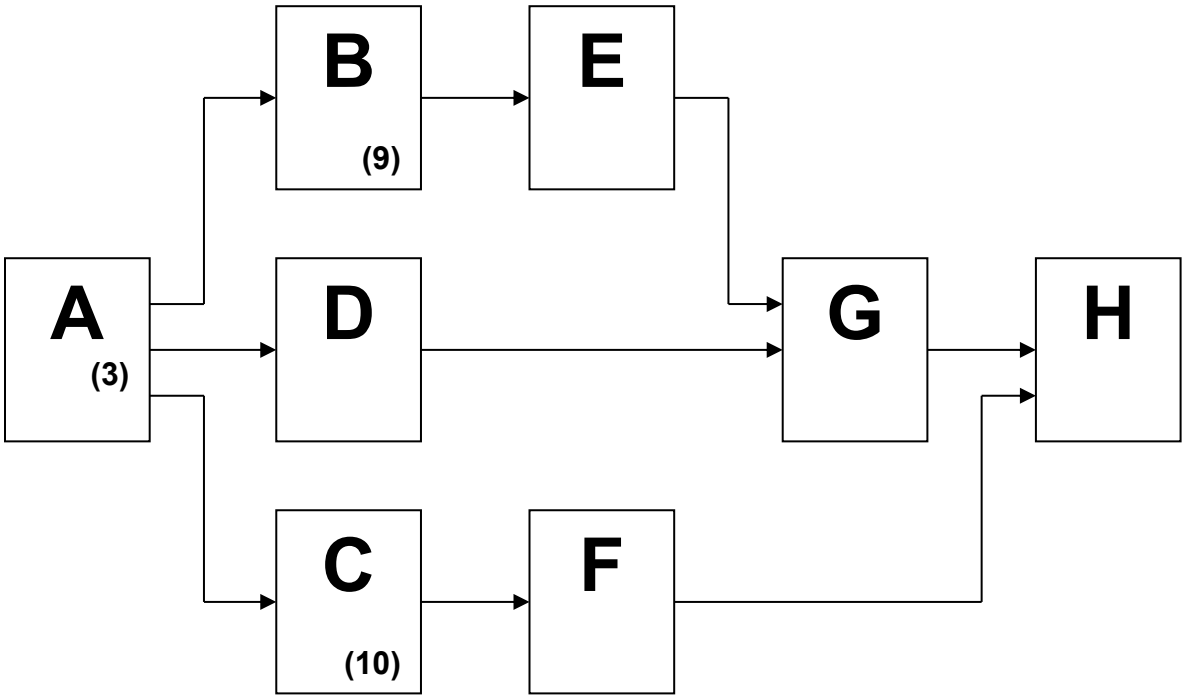
	Time (wks)		Cost ($000s)		Time	Cost	Incremental
Activity	Normal	Crash	Normal	Crash	Difference	Difference	Crash Cost/week
D	15	10	15	30			
E	7	6	10	12			
F	20	10	10	20			
G	12	8	12	20			
H	5	4	20	24			

Crash Comparison Table

Parameter	Project Before Crashing	Team Assigned
Completion Time		1
Critical Path		2
Cost		3

5.3.2 Schedule Recovery Worksheet

Network



Data Table

	Time (wks)		Cost ($000s)		Incremental	Project After Crashing		Critical
Activity	Normal	Crash	Normal	Crash	Crash Cost/week	Cost	Time	Path
A						$25K	3	
B							9	
C							10	
D	15	10	15	30				
E	7	6	10	12				
F	20	10	10	20				
G	12	8	12	20				
H	5	4	20	24				

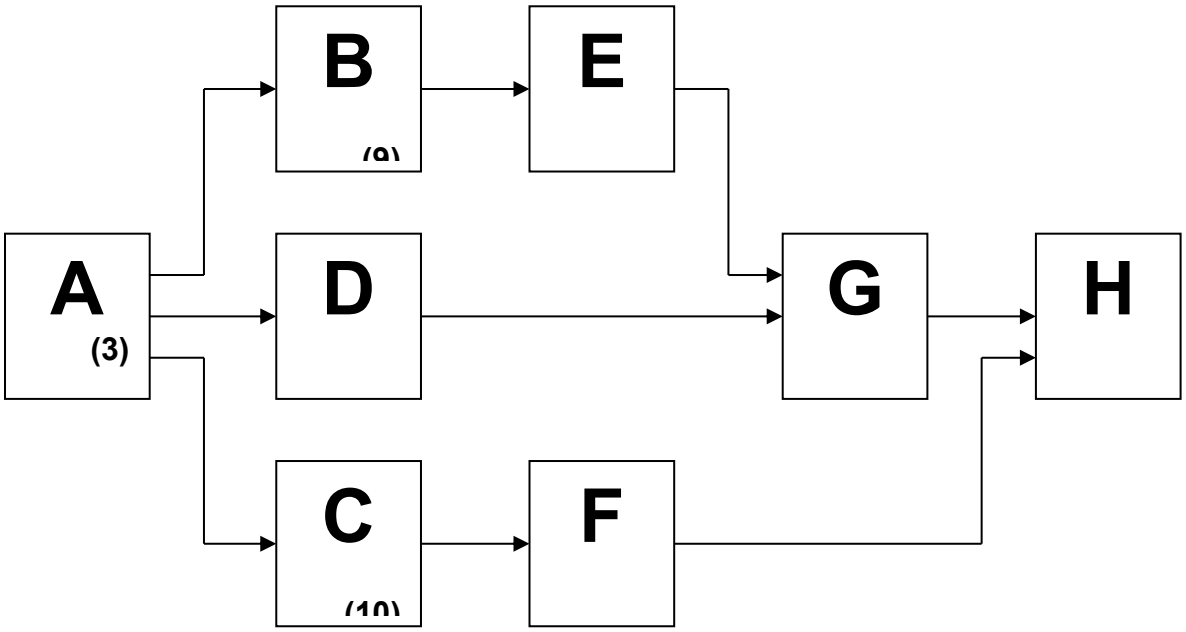
Crash Comparison Table

Parameter	Project Before Crashing	Project After Crashing
Completion Time		
Critical Path		
Cost		

5.3.3 Schedule Improvement Worksheet

Team ___ - Improve Schedule to ___ Weeks

Network



Data Table

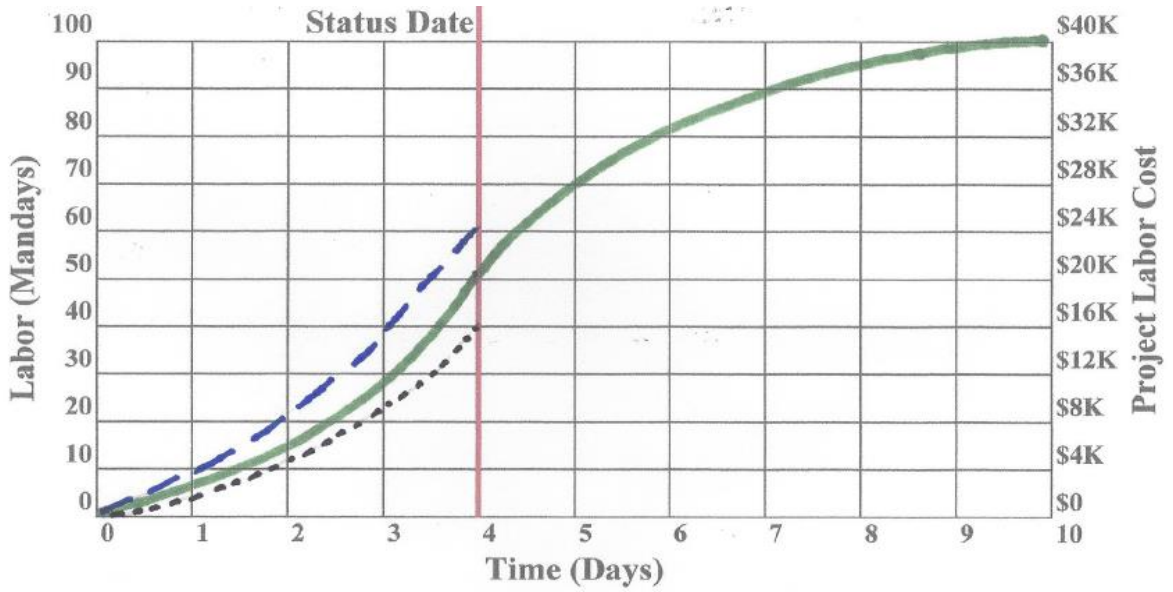
	Time (wks)		Cost ($000s)		Incremental	Schedule Imprv		Critical
Activity	Normal	Crash	Normal	Crash	Crash Cost/week	Cost	Time	Path
A						$25K	3	
B							9	
C							10	
D	15	10	15	30				
E	7	6	10	12				
F	20	10	10	20				
G	12	8	12	20				
H	5	4	20	24				

Crash Comparison Table

Schedule Improvement		Team 1	Team 2	Team 3
	36 Wk Schedule	35 Wk Schedule	34 Wk Schedule	33 Wk Schedule
Least Cost Increment				
Critical Path				
Est. at Completion				

5.4.1 Earned Value Example Worksheet

Earned Value Example Case A Worksheet



PV = _____

EV = _____

AC = _____

SV = _____ CV= _____

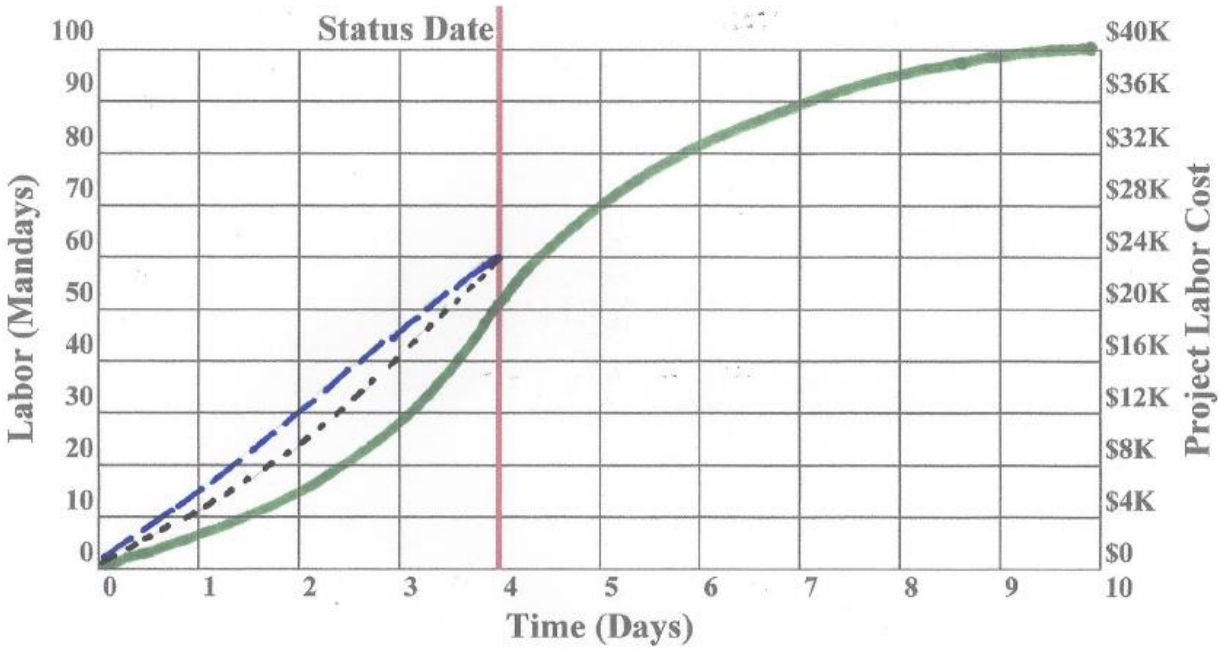
SPI = ____ CPI = ____

Schedule Status: _____ Budget Status: _____

Show Calculations:

5.4.2 Earned Values Worksheets

Earned Value Case B Worksheet Team 1



PV = _____

EV = _____

AC = _____

SV = _____ CV= _____

SPI = ____ CPI = ____

Schedule Status: _____ Budget Status: _____

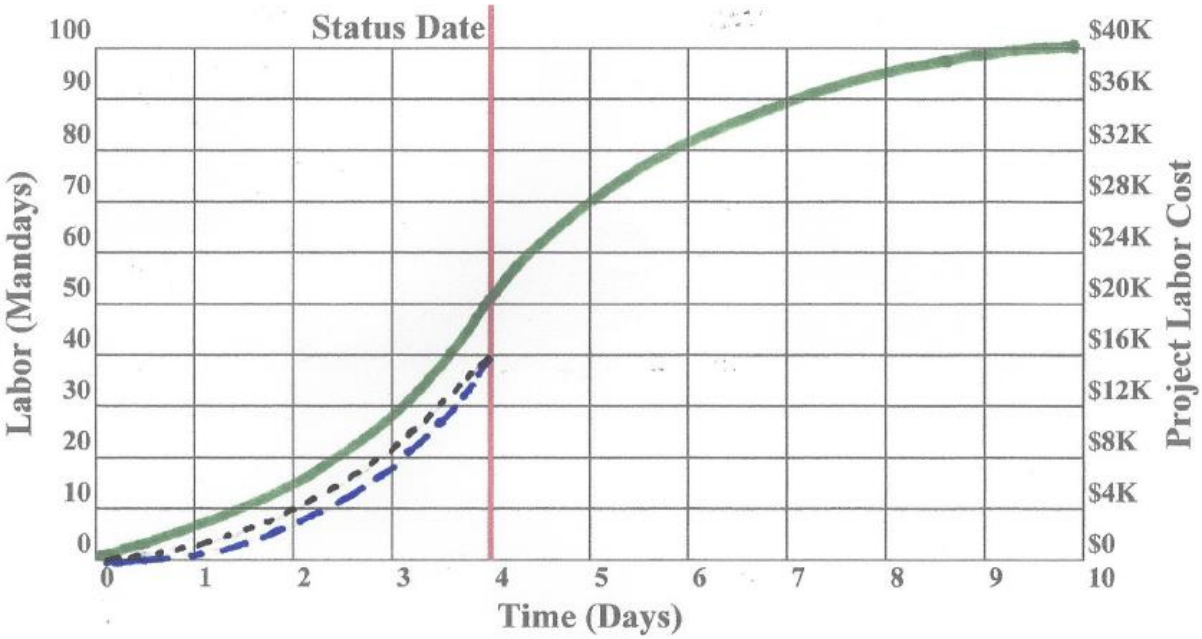
PV ——

EV .....

AC - - - - -

Show Calculations:

Earned Value Case C Worksheet Team 2



PV = _____

EV = _____

AC = _____

SV = _____ CV= _____

SPI = ____ CPI = ____

Schedule Status: _____ Budget Status: _____

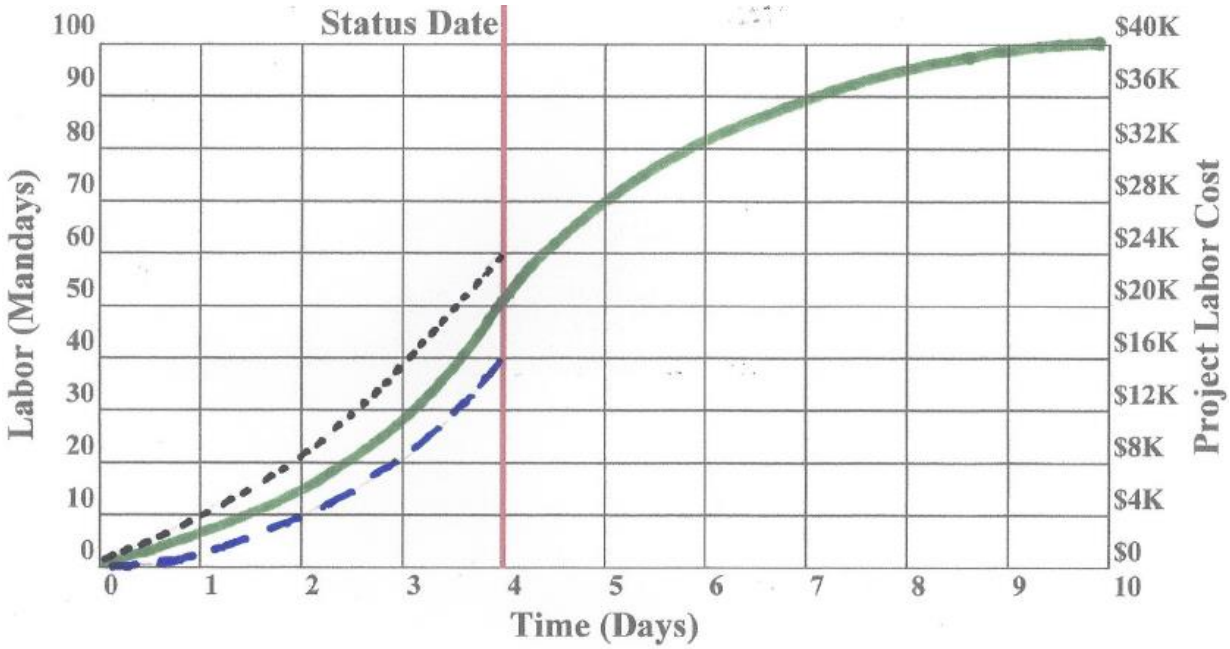
PV ——

EV .....

AC - - - - -

Show Calculations:

Earned Value Case D Worksheet Team 3



PV = _____

EV = _____

AC = _____

SV = _____ CV= _____

SPI = ____ CPI = ____

Schedule Status: _____ Budget Status: _____

Show Calculations:

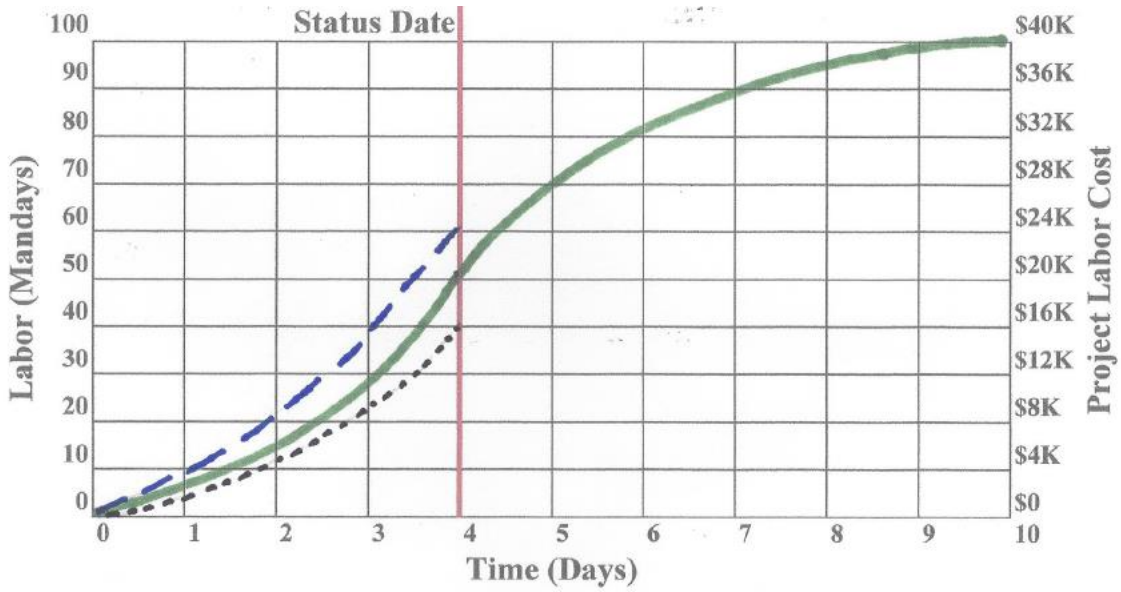
Causes for Earned Value Performance for Cases A through D in exercises 5.4.1 and 5.4.2

This table lists possible causes leading to the performance reflected in the earned value charts from the current exercise as well as the prior class exercise. The charts are identified as Cases A through D. This summary chart is sequenced after the individual cases and is larger than the one in the *Project Management eWorkbook* to provide more space for answers.

Causes for Earned Value Performance Table			
Case A - Class	**Case B - Team 1**	**Case C - Team 2**	**Case D - Team 3**

5.4.3 Forecasting Example Worksheet

Forecasting Example Case A Worksheet



Compute the following based on the given assumptions:

PV ——
EV .....
AC - - - - -

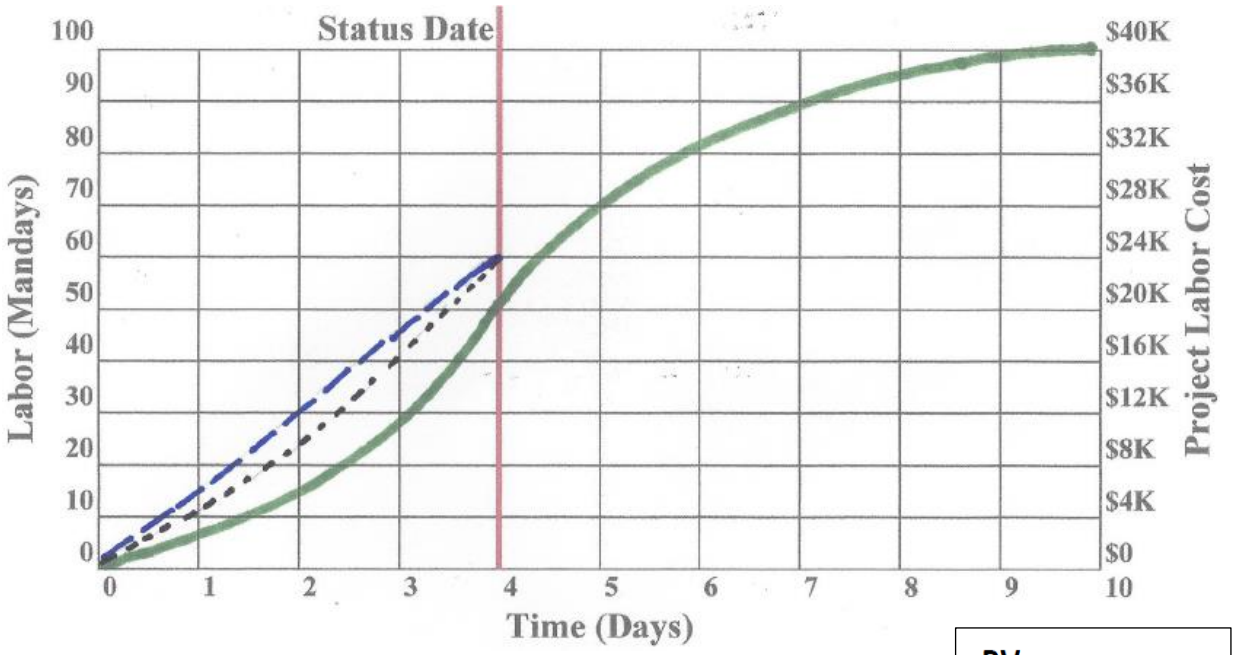
Forecast @ 100% Eff. ETC = ____ EAC = ____

ETC Efficiency to Meet the Budget TCPI = _____

Show Calculations:

5.4.4 Forecasting Worksheets

Forecasting Case B Worksheet Team 1

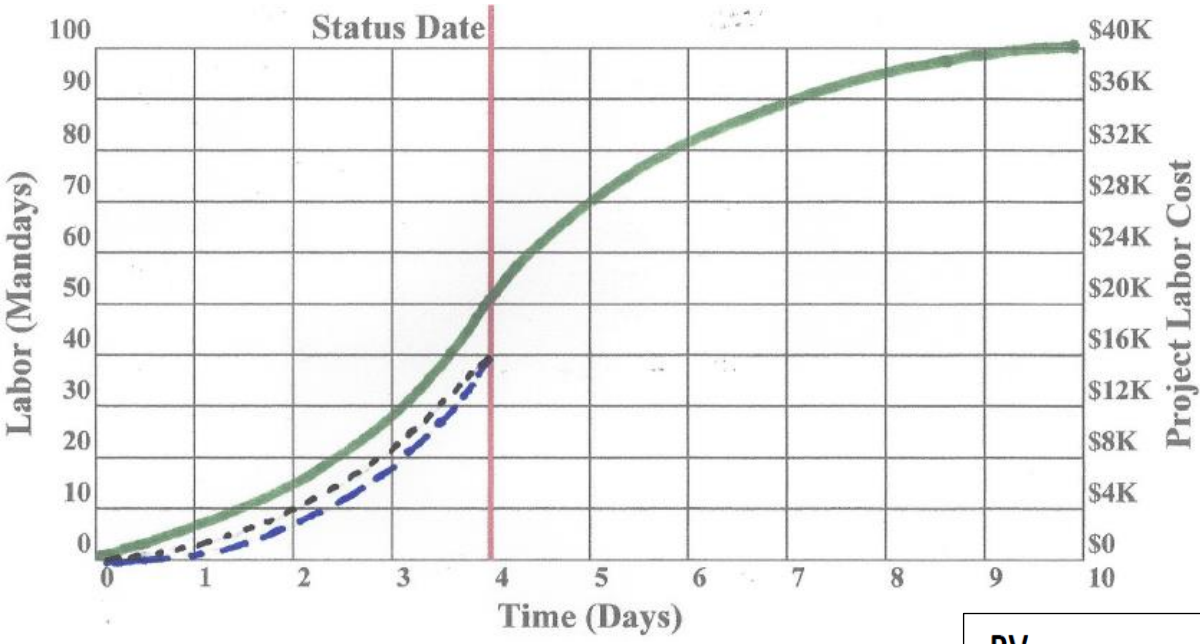


Forecast @ 125% Eff. ETC = ____ EAC = ____

ETC Efficiency to Beat Budget by $2K TCPI = _____

Show Calculations:

Forecasting Case C Worksheet Team 2

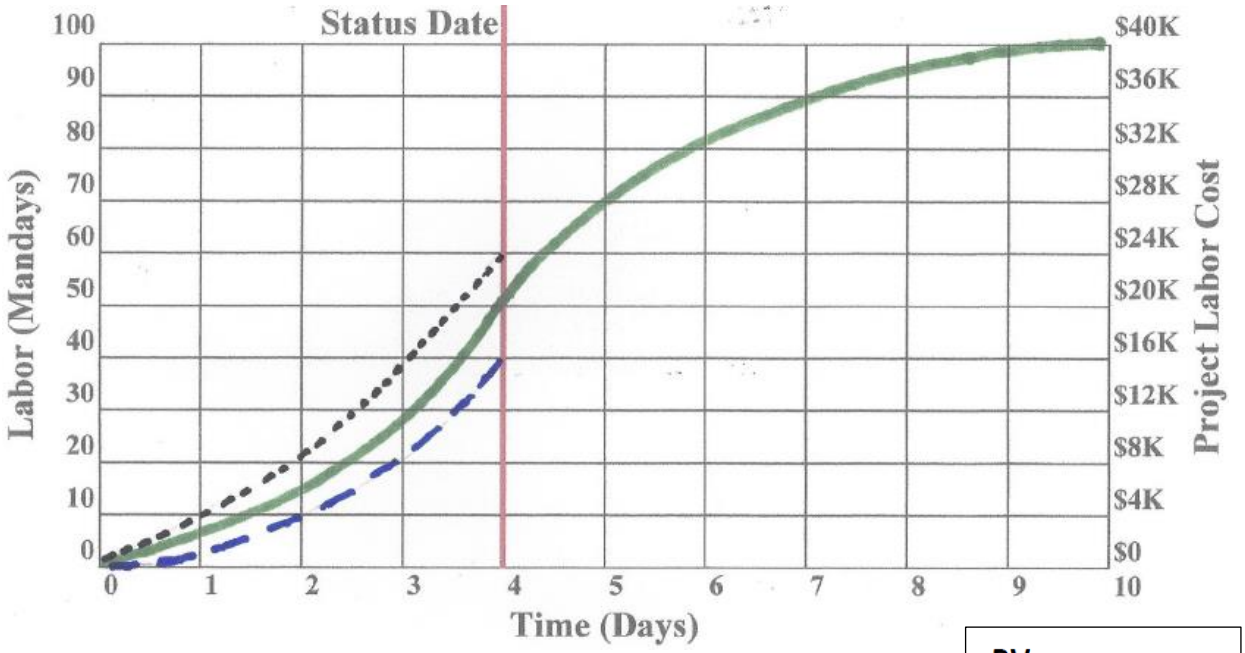


Forecast @ 125% Eff. ETC = ____ EAC = ____

ETC Efficiency to Beat Budget by $2K TCPI = _____

Show Calculations:

Forecasting Case D Worksheet Team 3



Forecast @ Current Eff. ETC = ____ EAC = ____

ETC Efficiency to Beat Budget by $12K TCPI = _____

Show Calculations:

Forecasting Comparison Table for Cases A through D in exercises 5.4.3 and 5.4.4

This table summarizes the forecasts for the earned value charts from the current exercise as well as the prior class exercise. The charts are identified as Cases A through D. This summary chart is sequenced after the individual cases and is larger than the one in the *Project Management eWorkbook*.

As current and forecasted efficiencies are recorded for each case, the probability of meeting the forecast is discussed and recorded in terms of zero, low, medium, and high. After agreeing on probability the cases are prioritized with one being the most likely to the least likely.

Probability of Meeting New Budget Goal Table				
Case	**Current Eff.**	**TCPI Eff.**	**Probability**	**Priority**
Case A - Class				
Case B - Team 1				
Case C - Team 2				
Case D - Team 3				

5.4.5 Performance Trends Worksheet

Performance Trend Case E Worksheet Team _____

Project Data: The following table reflects data for the first five weeks of an eight-week project. The data represents the cumulative costs from the beginning of the project to the end of the specified week for each parameter. (i.e. 350 is the cumulative EV for the first three weeks.)

Parameter	Week							
	1	2	3	4	5	6	7	8
PV	50	100	300	500	600	700	750	800
AC	100	200	400	600	650			
EV	75	150	350	550	625			

Line Graph of Project Parameters from above chart.

Assigned Week ___ PV= _____ AC = _____ EV = _____

CPI = _____ SPI = _____

EAC = _____ Budget Variance at Completion = _____

5.5.1 Change Control Process Worksheet Team ____

Change Request Form

Change Request Flow Chart

5.5.2 Change Control Implementation Worksheets

Change Control Implementation Worksheet A – Team 1

Material Substitution

During the equipment build at HTMI's plant in Brazil the Direct Materials Purchasing Agent, Adolph Hummer, decided to substitute a different paint rather than use the paint specified in the project that required specific single-source U.S. supplier. The color chips were virtually the same as the U.S. supplier. No one checked the Material Safety Data Sheets (MSDS) for the chemical content of the paint. The paint substitution allowed competitive bidding by local sources in Brazil, which saved $5,000 on the total cost of paint for each machine, and the Brazilian supplier delivered to the site free. He also had used the local source in the past with good results.

Bakersfield Plant Project Change Request Form

Consequence: After equipment assembly had begun at the Bakersfield site, plant personnel conducted their regular testing of paint for hazardous materials. The testing revealed that orange paint used on all large moving parts had excessive amounts of lead in violation of OSHA standards. HTMI had to disassemble the equipment and ship the components to another site for lead abatement. The abatement involved removing commercial components such as bearings, sleeves and joints, sand blasting of components to remove the lead paint, repainting, and reassembly of commercial components. It cost HTMI over $1,000,000 dollars and added four weeks to the installation.

Change Control Implementation Worksheet B – Team 2

Specification Change

Art Rost is the GMI Buyer responsible for machinery and equipment. One of his department objectives, and an element of his annual appraisal, is the amount of money saved through negotiations with the initial supplier versus their original quoted price. He was frustrated with the HTMI equipment purchase since the unique nature of the equipment did not leave much room for negotiating and leveraging other bidders. One of the specification requirements was to provide all training and support for ramp-up of the equipment, which HTMI had bid at $50,000. Art considered this excessive and in the final negotiations asked HTMI to remove it from their quote. HTMI quickly agreed to remove the item and signed a joint letter indicating the change, which became an attachment to the purchase order. Art showed a $50,000 savings

Bakersfield Plant Project Change Request Form

Consequence: Due to the proprietary nature of the equipment, the Purchasing Department at the Bakersfield Plant single-sourced development of training materials and train-the-trainer instructors to HTMI. During ramp-up they paid standard hourly service rates for all support personnel required from HTMI. The cost to GMI exceeded $250,000. In their quote, HTMI had originally planned to absorb the training as part of their new product development and their equipment estimates always had an allowance for start-up support. The $50,000 they submitted was only the extra support required for the new design.

Change Control Implementation Worksheet C – Team 3

Equipment Layout Change

Dave Bakus is the new Production Manager promoted from Facility Engineer by GMI for the Bakersfield Plant. He appears on the GMI organization chart in Chapter 8 as the Facility Engineer, since GMI did not promote him until after the plant construction began. During start-up he observed that his equipment operators and maintenance personnel had to go to the other side of the equipment for lock-out during tool changes, adjustments, or repairs. This required approximately 30 seconds of travel each way and over the course of a shift represented 10 to 20 minutes of downtime. More importantly, the added travel time was a deterrent to employees using the lock-out device as required.

Bakersfield Plant Project Change Request Form

Consequence: Involving Joe or other users of the equipment with the initial design might have identified the issue early, and the resulting change request showing the lock-out in the proper location would incur little or no cost. However, a change request at this point will incur an expense of $10,000 per machine to either relocate the existing lock-out or add an auxiliary lock out device.

Project Management Plan Components & Documents Listing			
Project Management Plan Component		**Project Document**	
A	Scope Management Plan	8	Duration Estimates
B	Requirements Management Plan	9	Issue Log
C	Schedule Management Plan	10	Lessons Learned Register
D	Cost Management Plan	11	Milestone list
E	Quality Management Plan	12	Physical resource Assignments
F	Resource Management Plan	13	Project Calendars
G	Communications Management Plan	14	Project Communications
H	Risk Management Plan	15	Project Schedule
I	Procurement Management Plan	16	Project Schedule Network Diagram
J	Stakeholder Engagement Plan	17	Project Scope Statement
K	Change Management Plan	18	Project Team Assignments
L	Configuration Management Plan	19	Quality Control Measurements
M	Scope Baseline	20	Quality Metrics
N	Schedule Baseline	21	Quality Report
O	Cost Baseline	22	Requirements Documentation
P	Performance Measurement Baseline	23	Requirements Traceability Matrix
Q	Project life Cycle Description	24	Resource Breakdown Structure
R	Development Approach	25	Resource Calendars
Project Document		26	Resource Requirements
1	Activity Attributes	27	Risk Register
2	Activity list	28	Risk Report
3	Assumption Log	29	Schedule Data
4	Basis of Estimates	30	Schedule Forecasts
5	Change Log	31	Stakeholder Register
6	Cost Estimates	32	Team Charter
7	Cost Forecasts	33	Test and Evaluation Documents

PMBOK® Guide, 2017, p. 89

Impacted Components & Documents Worksheet			
Material Substitution Team 1			
	PM Plan Components		Project Documents
Specification Change Team 2			
	PM Plan Components		Project Documents
Equipment Layout Change Team 3			
	PM Plan Components		Project Documents

5.6.1 Quality Benefits Worksheet

- **What are the benefits of having an effective quality process?**

- **What value does a company get from a strong quality reputation?**

- **What causes project managers to make poor quality decisions?**

5.6.2 Quality Metrics Worksheets

Quality Metrics Worksheet Part A

Team 1 - Cost Metrics, Tools, & Techniques	
Metric	**Tool/Techniques**

Team 2 - Time Metrics, Tools, & Techniques	
Metric	**Tool/Techniques**

Team 3 - Scope Metrics, Tools, & Techniques	
Metric	**Tool/Techniques**

Quality Metrics Worksheet Part B

Team 1 Human Resources Metrics, Tools, & Techniques	
Metric	**Tools/Techniques**

Team 2 - Communications Metrics, Tools, & Techniques	
Metric	**Tools /Techniques**

Team 3 - Problem Resolution Metrics, Tools, & Techniques	
Metric	**Tools /Techniques**

5.6.3 Project Deliverables Validation Worksheet

Team 1 - BCI	
Item #	**Facility Deliverables Validation**

Team 2 - HTMI	
Item #	**Manufacturing Process Deliverables Validation**

Team 3 - GMI	
Item #	**Production and Delivery of Gadgets Deliverables Validation**

5.6.4 Project Quality Situations Worksheet

Situation A - Software Testing - Team 1

- **Decision Authority: _____**
- **Decision: _____**
- **Supporting Philosophy: _____**
- **Bullet Points supporting the decision**

Situation B – Training – Team 2

- **Decision Authority: _____**
- **Decision: _____**
- **Supporting Philosophy: _____**
- **Bullet Points supporting the decision**

Situation C - Equipment Buy off at Supplier – Team 3

- **Decision Authority: _____**
- **Decision: _____**
- **Supporting Philosophy: _____**
- **Bullet Points supporting the decision**

5.7.1 Conflict Reduction Worksheet

Responsibilities - Conflict Reduction Tools and Techniques

Cost - Conflict Reduction Tools and Techniques

Schedule - Conflict Reduction Tools and Techniques

5.7.2 Personality Conflict Worksheet

- **TEAM 1 - Put yourself in Diane's position as project manager. How would you resolve the conflict you have with John Willy?**

- **TEAM 2 - Put yourself in John's position responsible for the new process performance. What would you do to resolve your conflict with Diane Baldwin?**

- **TEAM 3 - As the CEO of GMI, what actions would you take to minimize the conflict between Diane and John?**

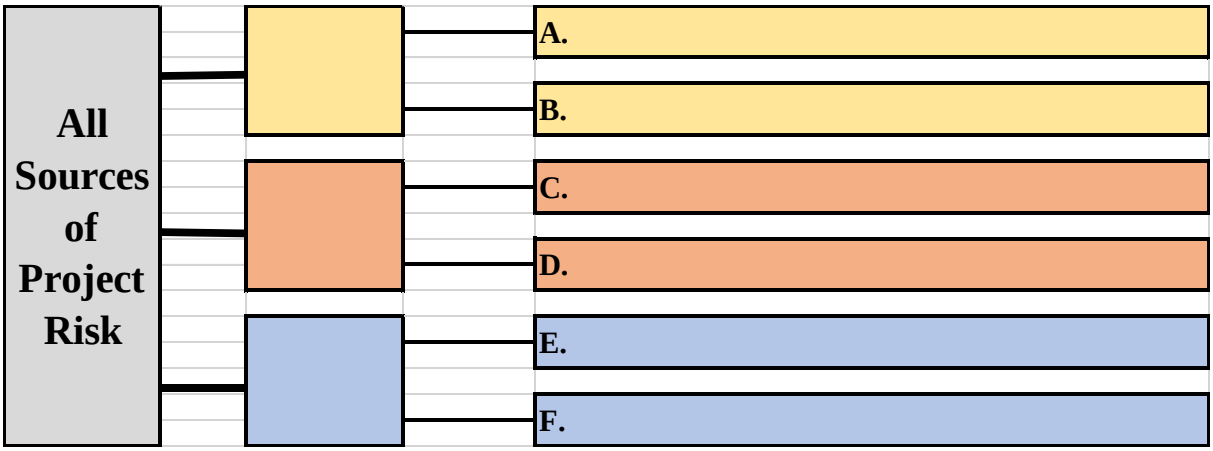
5.7.3 Project Scorecard Worksheet Team ___

Metrics, Status, Goals	Weekly and Cumulative Data

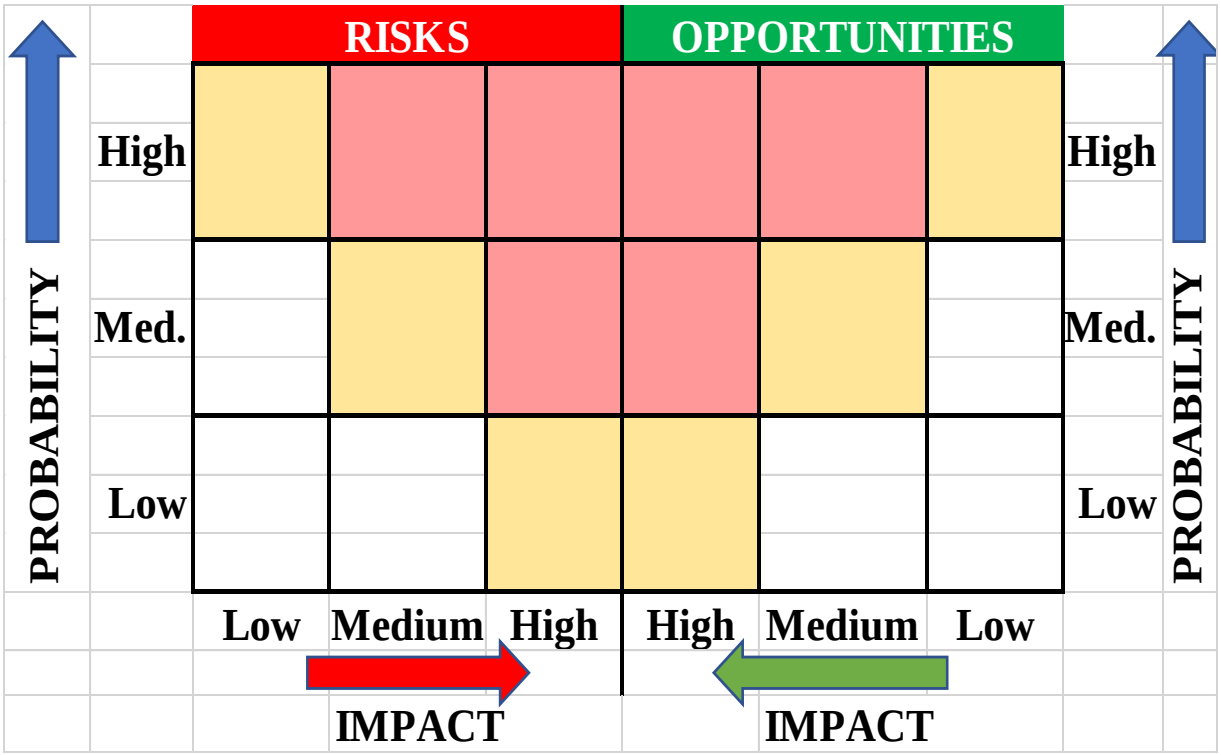
Analysis and Corrective Actions

5.8.1 Risk Identification and Assessment Worksheet Team ____

Risk Breakdown Structure (RBS)



Risk Probability and Impact Matrix (P/I Matrix)



5.8.2 Risk Register Worksheet Team ___

Risk Response Strategy Table							
Label	Risk Description	Escalate	Avoid	Accept	Transfer	Mitigate	Share
A							
B							
C							
D							
E							
F							

RISK REGISTER						
Identification		Assessment		Response Plan		
Risk	Consequence	Prob. (L, M, H)	Impact (L, M, H)	Action Trigger	Resp.	Response Plan

5.8.3 Risk Management Worksheet

- **What is your experience with formal or informal risk identification and contingency planning?**

- **How and when do you manage risk on a project?**

- **What value does risk management add to the project plan and what affect does it have on results?**