PDHonline Course P103H (8 PDH)

Basic Project Management

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Presents

Basic Project Management

Via

WEB BASED LEARNING

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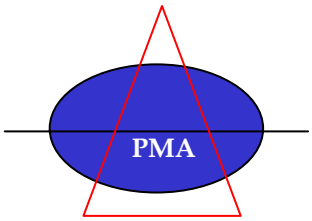


MODULE # 6:
Techniques for Measurement and Reporting Project Progress

OBJECTIVES OF PERFORMANCE MEASUREMENT

1. Identify significant problems before they occur.
2. Identify opportunities for schedule acceleration, cost reduction or technical improvement.
3. Facilitate the comparison of actual performance to plan.
4. Identify significant deviations from the plan.
5. Assure corrective action is taken when needed.
6. Determine value earned (what are you getting for money and time allocated).
7. To provide feedback to all shareholders.

Firsthand Observation

1. The Project Manager needs personal and direct contact.
2. Direct observation has value in determining physical progress.
3. Nothing substitutes for walking around and seeing for your self.

Interpretation of Verbal and Written Reports

1. Verbal reports can be easily misunderstood, distorted and too detailed.
2. Written reports are frequently poorly designed and too detailed:
   a. Summarize information, report exceptions only, use comparisons and ratios.
   b. Graphic displays are very effective.

Graphic Displays are Very Effective because:

1. Large amounts of data can be easily presented and understood.
2. Changes and rates of change are easily identified.
3. Schedule, cost and technical information can be presented simultaneously.
4. Original plans, past performance and future predictions are easily shown.
5. Greater visibility of the project is maintained.
6. However, graphic displays require considerable effort in design, preparation and maintenance.

THE EARNED VALUE TECHNIQUE

The following definitions, example of a project status report and analysis will provide system clarity and demonstrate the power of the earned value control technique.

Earned Value Definitions:

1. **BCWS** The budgeted cost for the work that is scheduled **to be** performed.
2. **BCWP** The budgeted cost for the work that **was** performed.
3. **ACWP** The actual cost for the work that was performed.
4. **BAC** The total budget at the completion of the project.
5. **C-VAR** The variance in **cost** from the Plan (BCWP – ACWP).
6. **S-VAR** The variance in **schedule** from the Plan (BCWP - BCWS).
7. **ETC** The estimate to complete.
8. **EAC** The estimate of the cost at the **completion** of the work
9. **CPI** A cost performance index (BCAWP/ACWP).
10. **SPI** A schedule performance index (BCWP/BCWS)

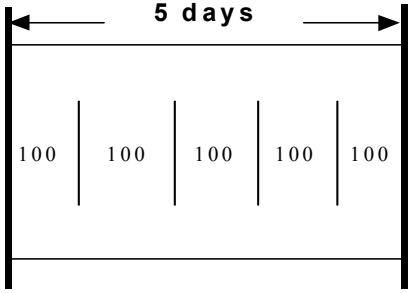
Now that we understand the all of the necessary terms, lets see exactly how the earned value system works.
Given the following data:
A task is scheduled to take 5 days to complete and each of the 5 days are equal.
Each day of the 5-day task is scheduled to cost $100, so the scheduled cost for the whole task is $500.
See the left-hand section of the chart on page 92.
Therefore:

The budget cost for the work scheduled (BCWS) is what?_ _ _ _ _ It is $500.

Now, at the end of 5 days, you determine that only 3 days of the task are complete (you do not receive credit for any partial days). See the center section of the chart on page 92.
So, what is the budget cost of the work performed (BCWP)? _ _ _ _ It is $300 (3 days x $100).
Now, accounting hands you a report that tells you that the actual cost for 5 days of effort but only 3 completed days of work was $400. See the right hand section of the chart on page 92.
So, what is the actual cost of the work performed (ACWP)? _ _ _ _ It is $400.
Now lets graph the data. See the chart on page 93.

EARNED VALUE TECHNIQUE

BCWS

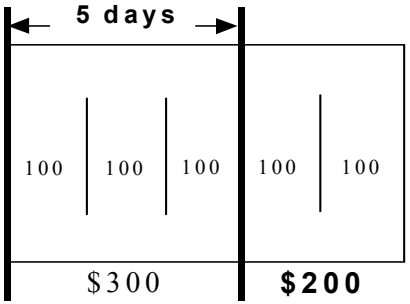


Subtask Total= $500

Therefore
BCWS = $500

Budget Cost of Work Scheduled

BCWP



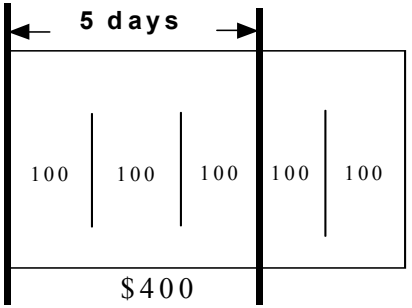
$300 worth of subtask are accomplished.

Therefore
BCWP = $300

Schedule variance = -$200

Budget Cost of Work Performed

ACWP



We spent $400 to accomplish the 3 subtasks.

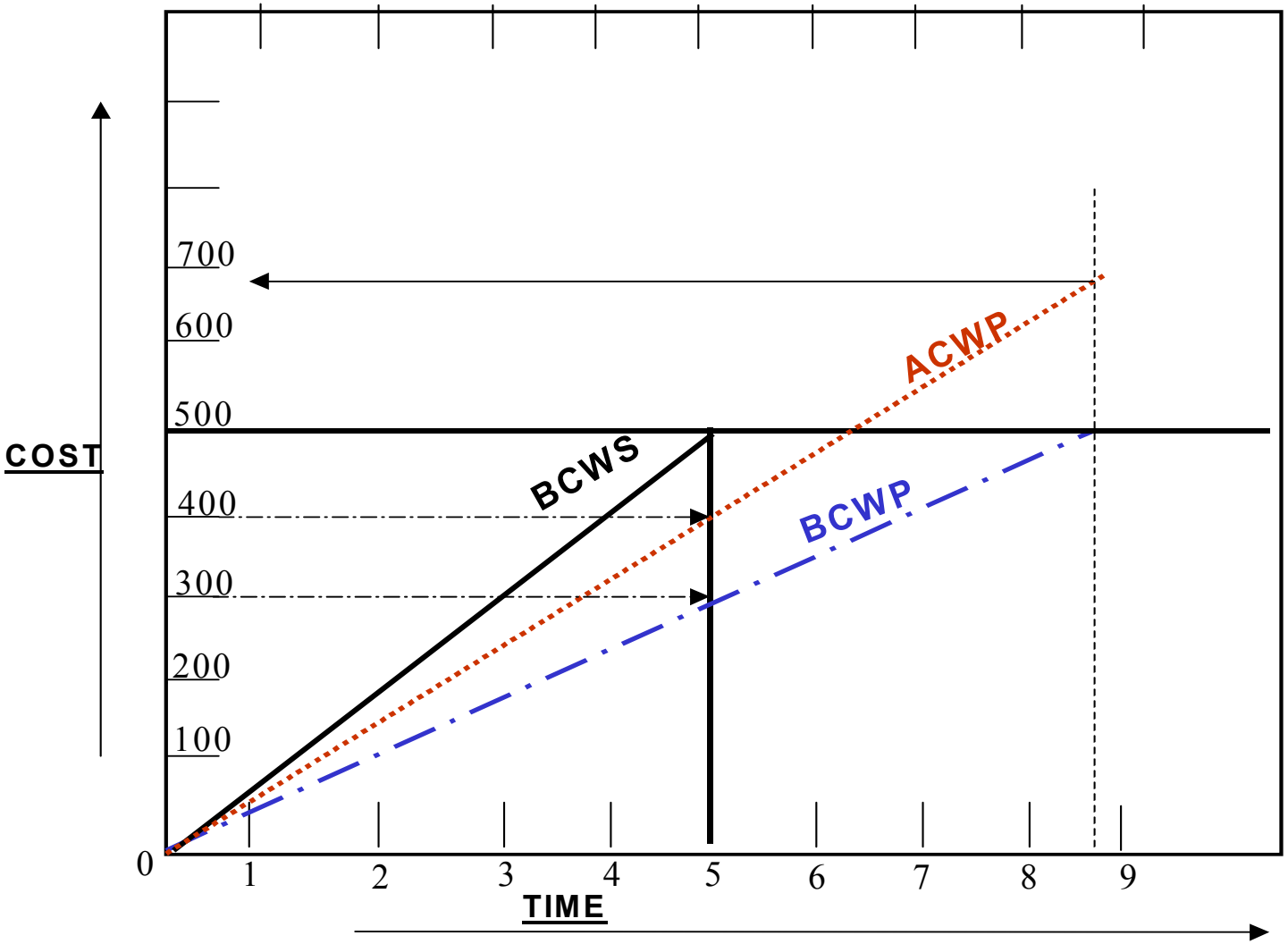
Therefore
ACWP = $400

Cost variance = -$100

Actual Cost of Work performed

Now lets draw a simple graph with cost as the vertical (Y) axis and time (days) as the horizontal (X) axis. See the chart on page 94
Plot BCWS at $500 and 5 days. This was the plan (schedule). Draw a line between zero, zero and $500, 5 days.
Now plot BCWP at 5 days (it took you 5 days to complete only 3 days worth of work). You earned $300 (this is what you actually accomplished). Draw a line between zero, zero and $300, 5 days. Extend the BCWP line until it intersects the $500 line (BCWS). Draw a vertical line through this point. This tells you that at the current rate of progress, the task will complete at about 8.5 days.
Now plot ACWP at the $400 you actually spent and the 5 days it took you. Draw a line between zero, zero and $400, 5 days. Extend the ACWP line until it intersects the 8.5 day vertical line. Draw a horizontal line back to the vertical (cost) axis. This tells you that your estimate at completion (EAC) is $667.
Now you know the task will take 8.5 days and cost $667 at completion.
If you have a ten-task project, you calculate BCWS, BCWP and ACWP for each task, the same as we have done above. You then sum all of the task and you plot the totals. This will tell you where you are, when you will finish and how much the project will cost at finish.
The same process works for a hundred or thousand task project. However, manually handling the data gets very labor intensive for larger projects. There are many software programs available to handle large volumes of data. Microsoft Project is one of them.

EARNED VALUE TECHNIQUE



THE EARNED VALUE EXERCISE

OBJECTIVES OF THIS EXERCISE:

1. Gain a basic understanding of how to calculate earned value and to evaluate schedule and cost variances.
2. Apply lessons learned so far.

WHAT TO DO:

1. Remember your PM training.
2. Read the situation write up.
3. Review the physical completion report.

DELIVERABLE:

1. The earned value of the project as of March 31, 2000.
2. The Cost Variance in $ and %.
3. The Schedule Variance in $ and %.
4. Statement on how the project is doing?
5. Chart BCWS, BCWP & ACWP.

TIME: 60 MINUTES

The Situation:

You are the project manager. You have just received your Construction Manager's report showing budgeted work scheduled, work accomplished and actual cost for the work accomplished as of March 31, 2000. See the attachment on page 96:
Now, you must figure out:

1. Is the project (forget critical path considerations):
   a. On schedule?
   b. Ahead of schedule?
   c. Behind schedule?
2. What is the earned value as of March 31, 2000.
3. What is the actual cost as of March 31, 2000?
4. How is the project doing?
5. Draw a graph showing BCWS, BCWP, ACWP as functions of time.
6. How many days will the project have taken at finish.
7. How much will it cost at completion.

DEVELOP YOUR EARNED VALUE SOLUTION NOW.

(Hint – develop an earned value solution for each task, then sum the task.)

Project Management Associates, Inc.

Construction Status Report

as of March 31, 2000

		Days													
TASK		1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	BC	100	100	100	100	100									
	AC	120	120	110	180	170									
B	BC			200	200	200	250	250	200						
	AC			300	320	380	480								
C	BC							100	100	100	100	50			
	AC							50	150	100	130	70			
D	BC									50	50	50	50		
	AC									100	50	40	80		
E	BC												100	100	100
	AC												100	160	
F	BC								100						
	AC								140						
G	BC									100	100	100	100	100	100
	AC									90	120	120	70	190	
H	BC				60	80	100	120	140	100	60				
	AC				65	80	105	115	145	180					
I	BC						150	150	150	200	200	200	150	100	
	AC						165	170	135	195	215	520			
J	BC		90	100	110	120								60	80
	AC		90	80	110	110								140	
K	BC						150	200	250	200					
	AC						150	250	250	350					
L	BC				400	400	500	500	600	600	300	100			
	AC				450	500	750	850	950						
M	BC											60	80	100	120
	AC											170	320		

BC = Budget Cost AC = Actual Cost Gray - Work completed March 31, 2000

EARNED VALUE SOLUTION
WORKSHEET

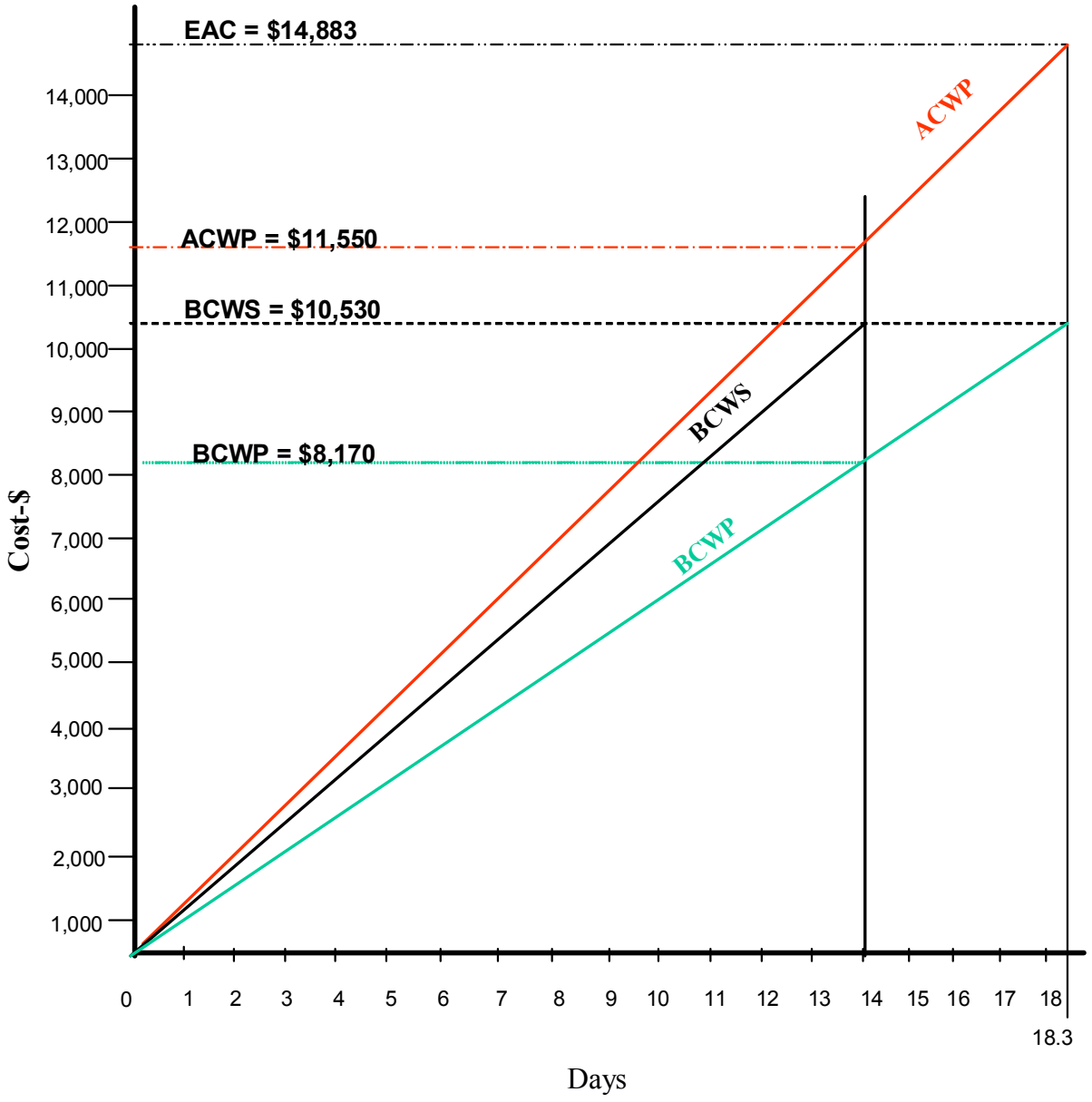
AS OF March 31, 2000

TASK	Budget Cost (BCWS)	Earned Value (BCWP)	Actual Cost (ACWP)	COST VARIANCE		SCHEDULE VARIANCE	
				BCWP-ACWP	(BCWP-ACWP) / BCWS	BCWP-BCWS	(BCWP-BCWS) / BCWS
				$	%	$	%
A	500	500	700	-200	-40.0	0	0
B	1,300	850	1,480	-630	-48.5	-450	-34.6
C	450	450	500	-50	-11.1	0	0
D	200	200	270	-70	-35.0	0	0
E	300	200	260	-60	-20.0	–100	–33.3
F	100	0	140	-140	-140.0	–100	–100.0
G	600	500	590	-90	-15.0	–100	–16.7
H	660	600	690	-90	-13.6	-60	-9.1
I	1,300	1,050	1,400	-350	-26.9	–250	–19.2
J	560	480	530	-50	-8.9	–80	–14.3
K	800	800	1,000	-200	-25.0	0	0
L	3,400	2,400	3,500	-1,100	-32.4	–1,000	–29.4
M	360	140	490	-350	-97.2	–220	–61.1
Total	10,530	8,170	11,550	-3,380	-32.1	-2,360	-22.4

How does your answer compare to the above solution? Not that hard is it?
See the graph on page 98.

THE EARNED VALUE SOLUTION

CHART



Project Review Meetings

Internal Meeting

1. You must open communication with the team.
2. You must allow the team to report the status.
3. You should obtain agreement that problems or opportunities exist.
4. The team should identify individuals responsible for action to resolve each problem.
5. The team should report on previous action assignments.
6. Problems are NOT solved in the project meeting. Separate problem solving meetings should be held, attended only by those concerned directly with the problem.

Top Management Meeting
Some good questions to be prepared to answer are:

1. Is this project on schedule? If not, has the end date been extended? If yes, has the customer been notified?
2. Are there team/staffing issues? If yes, what is the action plan?
3. Is this project on budget? If no, what is the action plan?
4. Are there any new requirements?
5. Are there any scope change request pending?
6. Is the customer satisfied? If not, what is the action plan?
7. What is the EAC (Estimated Cost at Completion)? How did you arrive at your EAC?
8. How is the cash flow?

PROJECT REVIEW MEETINGS FINANCIAL REPORTS

		Last Month	Current Month	Delta To Last Month
Contract Value	- Current	24,500	24,575	+25
	- EAC	25,750	25,750	0
Total Cost	- Paid to date	12,378	13,616	+1,238
	- Open P.O.	6,189	4,951	–1,238
	- ETC	1,033	1,093	+60
	- EAC	19,600	19,660	+60
Gross Margin	- $	4,900	4,915	+15
	- %	20.0	20.0	0
Cash	Out	13,425	14,425	+1,000
	In	13,150	14,150	+1,000

EAC – Estimate at Completion
ETC – Estimate to Complete

PROJECT REVIEW MEETINGS FINANCIAL

Let's look at a simple project financial status report. See the chart on page 99.
The 3 rows across the top are titled:

1. Last month
2. Current month
3. Delta (changes) to last month
   (plus numbers are good, negative numbers are bad).

The rows in the vertical column down the left side are titled:

1a. Contract Value – Current
1b. Contract Value – EAC
2a. Total Cost – Paid to date
2b. Total Cost – Open to P.O.
2c. Total Cost – ETC
2d. Total Cost – EAC
3a. Gross Margin - $ (dollars)
3b. Gross Margin - %
4a. Cash – Out
4b. Cash – In

Where EAC = Estimate **at** completion
ETC = Estimate **to** complete
Open P.O. = Open purchase order (purchase order amounts not paid yet)
Since this sheet is a summary sheet, it may take rolling up several levels of sub accounts to make up the number you see on the summary sheet.
Current Contract Value = Original contract value plus (or minus) any change orders booked.
EAC Contract Value is the project manager's estimate of what the final contract value will be after all change orders (plus and minus) are processed.
EAC = Total cost paid to date + Total cost of open P.O.'s + the ETC
Cash Out = checks written + internal cost posted
Cash In = the total of the customer's payments received
Gross Margin - $ (dollars) is = EAC contract value – EAC Total Cost
Gross Margin - % (percent) is = (Gross Margin $/EAC Contract Value) x 100%

The form is usually completed by:

1. Transferring the current month's data from last month's report to fill out the column titled "Last Month."
2. The project manager fills out or "has" filled out the Current Month column as follows:
   a. Current Contract Value is simply the original contract value plus any booked changes.
   b. EAC Contract Value is simply the project manager's best estimate of where the project's contract value will end up.
   c. Total Cost Paid to date usually comes from accounting.
   d. Total Cost Open P.O. usually comes from accounting.
   e. ETC is generated by the project manager project/team.

f. EAC is simply item 2C + 2D + 2E.
g. The Gross Margin dollars is calculated by EAC Contract Value – EAC Total Cost.
h. The gross margin % is calculated by including EAC gross margin dollars by the EAC contract value converted to percent.
i. Cash flow out and cash flow in is usually supplied by accounting.

Guidelines for Conducting More Effective Meetings:

1. Question the need for the meeting – explore other alternatives.
2. Have a specific objective for each meeting.
3. Have a detailed agenda and distribute in advance.
4. Keep participants to a minimum – attendance by invitation only.
5. Conduct one piece of business at a time. Stay with the agenda.
6. Allow each member to contribute in his or her way.
7. **Get closure (decision) on each item**; test for commitment.
8. Publish meeting minutes of findings, decisions, and action item assignments.
9. Start and END on time!

MEETING AGENDA FORM

Name of Group: _____	Date: _____
Title of Meeting: _____	Starting Time: _____
	Ending Time: _____
Meeting Called by: _____	Place: _____
Meeting Type: _____	Background Materials: _____
Desired Outcomes: _____	Please Bring: _____
Manager/ Chairperson : _____	Meeting Method: _____

Facilitator: _____	Decision Making Method: _____
Recorder: _____	Final Decision Maker: _____
Group Members: _____	
_____	Special Notes: _____
_____	_____
_____	_____

Order of Agenda Items	Person Accountable	Process	Time Allocated

MAKING EFFECTIVE PRESENTATIONS

The ability to make skillful presentation is a particularly important management asset. Project Managers are often called on to make presentations to the customer, upper management and the team. The following is a **performance improvement checklist** for making effective presentations:

1. Establish your objectives wisely; identify what you want your audience to know, why you want them to know it and what you want them to do about it.
2. Know your subject thoroughly. Don't fake it.
3. Learn as much as possible about your audience in advance. Relate your material directly to them, speak in their language and try to anticipate their interest, concerns and questions.
4. Prepare an outline to objectively keep your thoughts in a planned, logical sequence.
5. Don't try to cover more material than you have time for.
6. Be natural and sincere (you can't fake sincerity); don't read or memorize material, speak conversationally, as if you were speaking individually to each person in the audience; slowly scan the audience, developing eye contact with individual listeners.
7. Start with an "attention-getter" that leads into the subsequent material. (If an anecdote, ensure that it's relevant to the subject and in good taste.)
8. Exhibit confidence – be enthusiastic about your subject and eager to share.
9. Tell your audience briefly what you are going to say, say it and then briefly summarize what you've said.
10. Change your pace. Vary delivery rate, pitch and volume.

11. Ensure that the audience absorbs and understands what you are saying, but don't let the presentation drag – pause briefly after each key point to let it register.
12. End with a strong "bottom line" message – it's the last and most important chance to get your message across.
13. Close on a positive note.
14. Provide a transcript or summary of your presentation, unless you are going to involve the audience in use of this material during the presentation. It should be distributed along with any reading material after the presentation, so it will not compete for attention while you are speaking.

WRITING EFFECTIVELY

The ability to write well is a key managerial asset. The following suggestions will improve writing skills:

1. Clearly understand your objectives and make them clear in your writing.
2. Know your subject, be timely, accurate and complete. Too often we speak and write from lack of information or wrong information.
3. Know your receiver – write to them about things of interest and importance to them in language they can really understand.
4. Keep the text short and to the point. Put details and backup material as attachments.
5. Use an effective format. Stress readability and clear separation of ideas, e.g. use headings and subheadings, indent, itemize, underline for emphasis, etc.
6. Begin with the key message to catch the reader's attention and draw them into the text.
7. Write simply and directly – say exactly what you mean, be clear and concise. Avoid wordiness, vagueness, jargon and ambiguity – use familiar words.
8. Use single ideas, self-contained paragraphs and stimulating opening and closing sentences.
9. Close, when appropriate, with a brief recap of what it is you want the reader to know, agree to, or do.
10. Review your text as though you were the person receiving it.