Ch. 11 - Leveling Comparisons

PACK Leveling Example
Comparison of the RIC produced by
(a) Resource Leveling using PACK or MOM, and
(b) Resource Allocation using P3 2.0b (with max_Res1=10 and Smoothing set to either "Non-" or "Time Constrained")

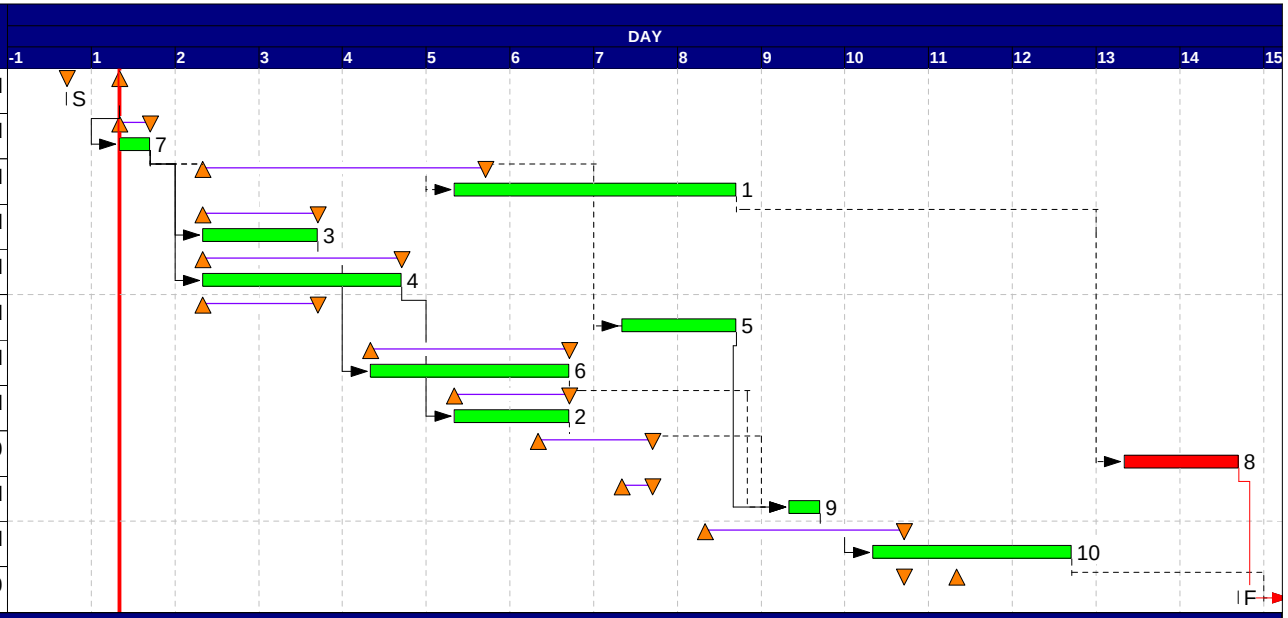
Day																				max					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					Res2	*n*	ΣY	Σ(Y^2)	RIC	Method
Resource Histogram																									
7	9	11	11	16	16	12	6	6	6	3	1	1	1	1	2						16	109	1153	1.552731	Unleveled
7	9	7	7	10	10	10	6	6	6	5	7	7	7	3	2						16	109	821	1.105631	PACK
7	9	7	7	10	10	10	6	6	6	5	7	7	7	3	2						16	109	821	1.105631	MOM
7	9	7	7	10	10	10	10	10	10	7	3	3	3	1	2						16	109	909	1.224139	P3 & SureTrak

Two-Resource Leveling Example, Figure 11.16
Comparison of the RIC produced by
(a) Resource Leveling using the Minimum Moment Method, and
(b) Resource Allocation using P3 2.0b or SureTrak 2.0 (with max_Res1=6, and max_Res2 variable)

Day																				max					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Res2	*n*	ΣY	Σ(Y^2)	RIC	Method
Res1																									
4	4	6	5	5	6	6	6	4	4	4	4	4	4	6	6	6	6				18	90	466	1.035556	MOM
4	4	6	5	5	6	6	6	4	5	5	4	3	3	6	6	6	6			**10**	18	90	470	1.044444	P3 & SureTrak
4	4	6	5	5	6	6	6	4	5	5	4	3	3	6	6	6	6			**11**	18	90	470	1.044444	P3 & SureTrak
4	4	6	6	6	6	6	6	4	5	5	4	6	6	6	6	2	2			**12**	18	90	482	1.071111	P3 & SureTrak
Res2																									
5	5	8	8	8	11	11	12	7	7	7	8	8	8	5	5	3	3				18	129	1035	1.119524	MOM
5	5	8	8	8	7	7	7	2	10	10	8	9	9	10	10	3	3			**10**	18	129	1037	1.121687	P3 & SureTrak
5	5	8	8	8	7	7	7	2	10	10	8	9	9	10	10	3	3			**11**	18	129	1037	1.121687	P3 & SureTrak
5	5	8	12	12	12	12	12	7	10	10	8	3	3	5	5					**12**	16	129	1215	1.168199	P3 & SureTrak

When Res2<=9, P3 and SureTrak solutions extend project duration beyond 20 days

ID	Act	T	R	ESD	EFD	SSD	SFD	FF	TF
0	S	0	0	01JAN98	31DEC97	01JAN98	31DEC97	0	4d
7	7	1d	7	01JAN98	01JAN98	01JAN98	01JAN98	0	4d
1	1	4d	1	02JAN98	05JAN98	05JAN98	08JAN98	4d	4d
3	3	2d	3	02JAN98	03JAN98	02JAN98	03JAN98	0	4d
4	4	3d	4	02JAN98	04JAN98	02JAN98	04JAN98	0	4d
5	5	2d	5	02JAN98	03JAN98	07JAN98	08JAN98	0	2d
6	6	3d	6	04JAN98	06JAN98	04JAN98	06JAN98	2d	4d
2	2	2d	2	05JAN98	06JAN98	05JAN98	06JAN98	2d	4d
8	8	2d	8	06JAN98	07JAN98	13JAN98	14JAN98	0	0
9	9	1d	9	07JAN98	07JAN98	09JAN98	09JAN98	0	2d
10	10	3d	10	08JAN98	10JAN98	10JAN98	12JAN98	2d	2d
11	F	0	0	11JAN98	10JAN98	15JAN98	14JAN98	0	0



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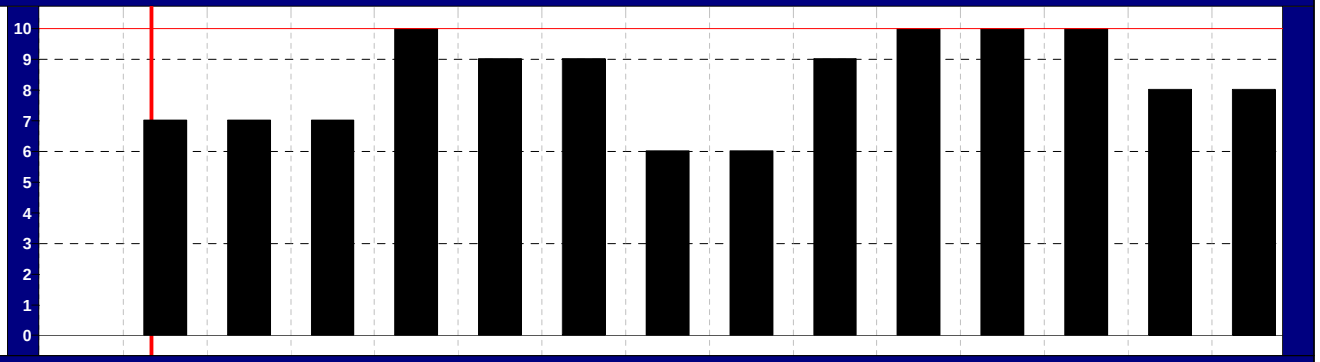

ID	Description	Units	Total	Display: Quantity															
RES1	Resource 1		116		7	7	7	10	9	9	6	6	9	10	10	10	8	8	
Total				0	7	7	7	10	9	9	6	6	9	10	10	10	8	8	*

-1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
DAY

Start date	01JAN98
Finish date	14JAN98
Data date	01JAN98
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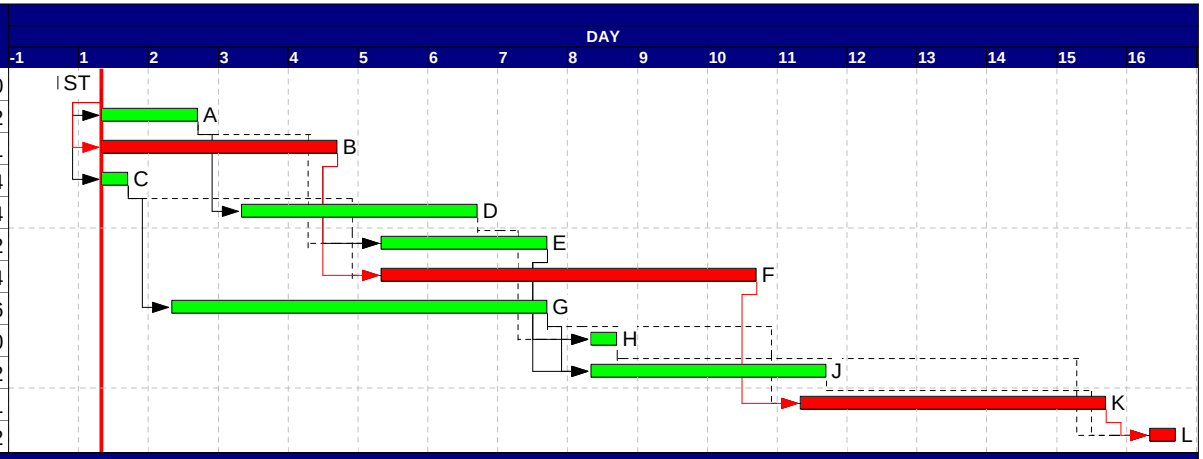
Wiest's Resource Allocation Example
SureTrak's Solution Matches Wiest's

- Early bar
- Unleveled start point
- Unleveled finish point
- Unleveled bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF	R
5	ST	0	01JAN08	31DEC07	01JAN08	31DEC07	0	0	0
10	A	2d	01JAN08	02JAN08	07JAN08	08JAN08	0	6d	2
15	B	4d	01JAN08	04JAN08	01JAN08	04JAN08	0	0	1
20	C	1d	01JAN08	01JAN08	04JAN08	04JAN08	0	3d	4
25	D	4d	03JAN08	06JAN08	11JAN08	14JAN08	1d	8d	4
30	E	3d	05JAN08	07JAN08	09JAN08	11JAN08	0	4d	2
35	F	6d	05JAN08	10JAN08	05JAN08	10JAN08	0	0	4
40	G	6d	02JAN08	07JAN08	05JAN08	10JAN08	0	3d	6
45	H	1d	08JAN08	08JAN08	15JAN08	15JAN08	7d	7d	0
50	J	4d	08JAN08	11JAN08	12JAN08	15JAN08	4d	4d	2
55	K	5d	11JAN08	15JAN08	11JAN08	15JAN08	0	0	1
60	L	1d	16JAN08	16JAN08	16JAN08	16JAN08	0	0	2



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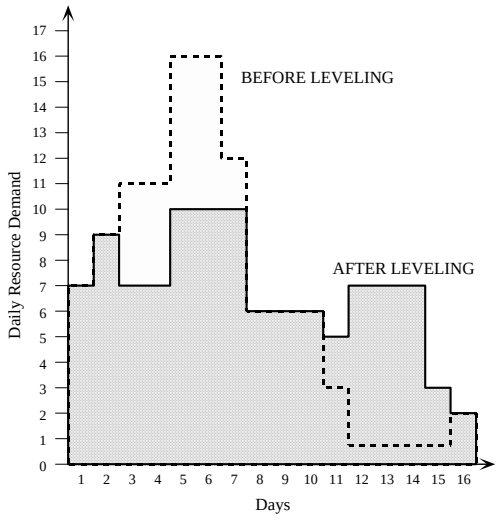
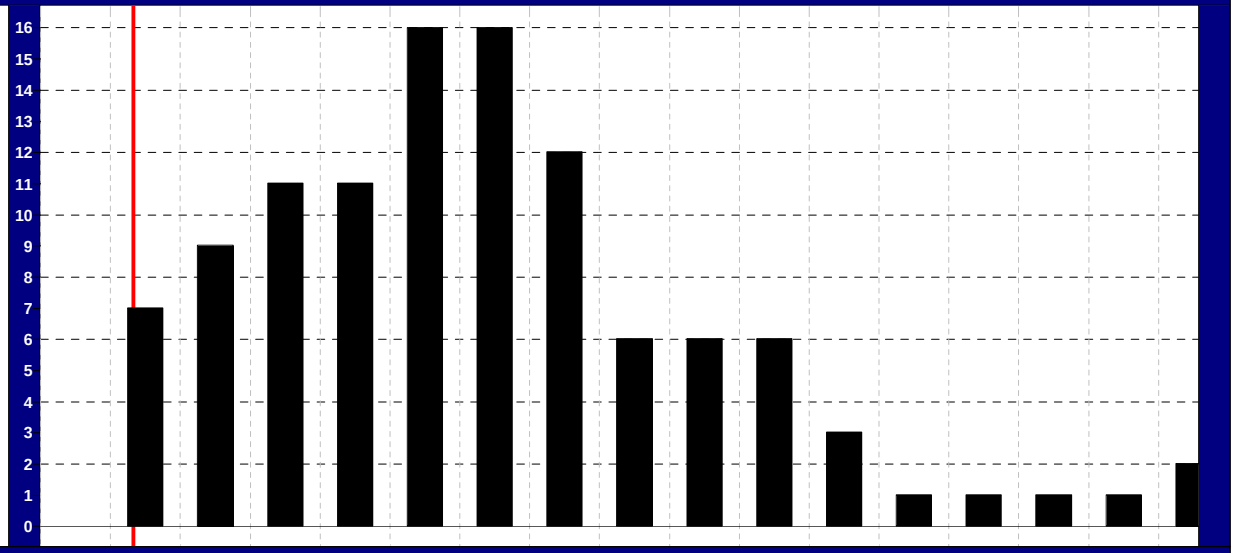
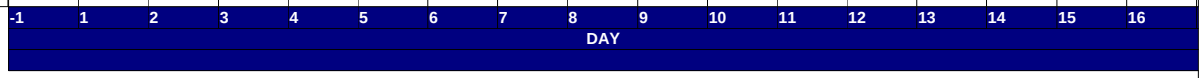




ID	Description	Units	Display: Quantity
RES1	Resource1		7 9 11 11 16 16 12 6 6 6 3 1 1 1 1 2



Start date	01JAN08
Finish date	16JAN08
Data date	01JAN08
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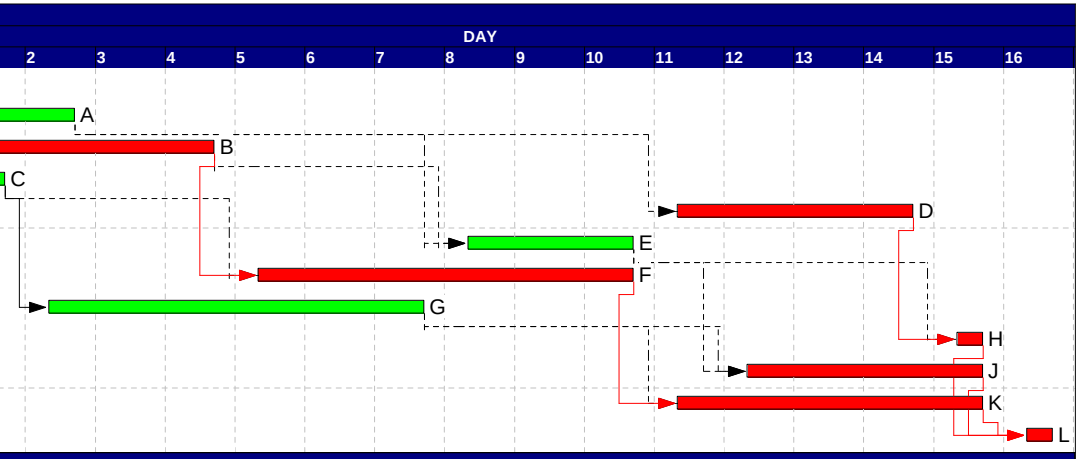
Early Start Resource Profile
PACK Leveling Example

Early bar
Progress bar
Critical bar
Summary bar
Start milestone point
Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF	R
5	ST	0	01JAN08	31DEC07	01JAN08	31DEC07	0	0	0
10	A	2d	01JAN08	02JAN08	07JAN08	08JAN08	5d	6d	2
15	B	4d	01JAN08	04JAN08	01JAN08	04JAN08	0	0	1
20	C	1d	01JAN08	01JAN08	04JAN08	04JAN08	0	3d	4
25	D	4d	11JAN08	14JAN08	11JAN08	14JAN08	0	0	4
30	E	3d	08JAN08	10JAN08	09JAN08	11JAN08	1d	1d	2
35	F	6d	05JAN08	10JAN08	05JAN08	10JAN08	0	0	4
40	G	6d	02JAN08	07JAN08	05JAN08	10JAN08	3d	3d	6
45	H	1d	15JAN08	15JAN08	15JAN08	15JAN08	0	0	0
50	J	4d	12JAN08	15JAN08	12JAN08	15JAN08	0	0	2
55	K	5d	11JAN08	15JAN08	11JAN08	15JAN08	0	0	1
60	L	1d	16JAN08	16JAN08	16JAN08	16JAN08	0	0	2



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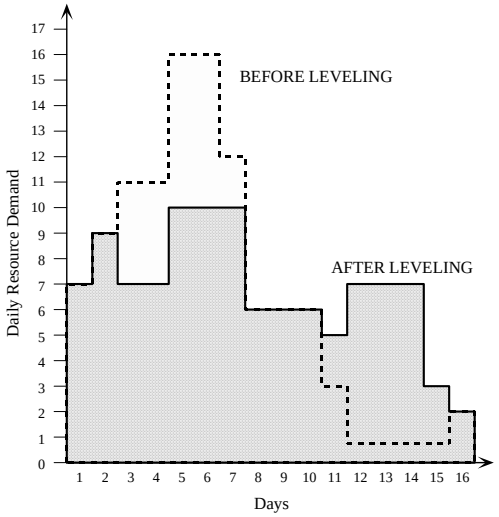
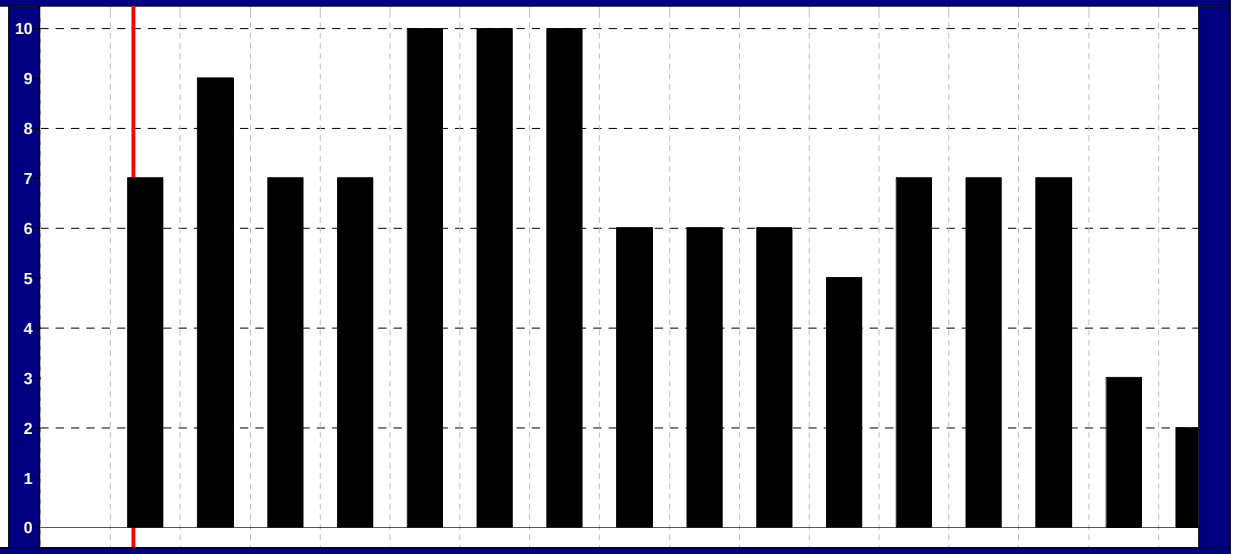
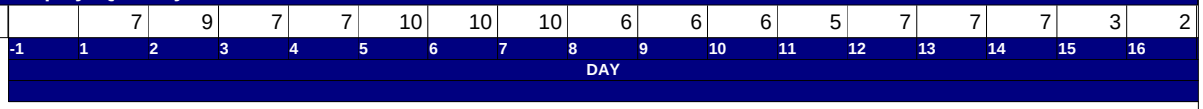




ID	Description	Units
RES1	Resource1	

Display: Quantity



Start date	01JAN08
Finish date	16JAN08
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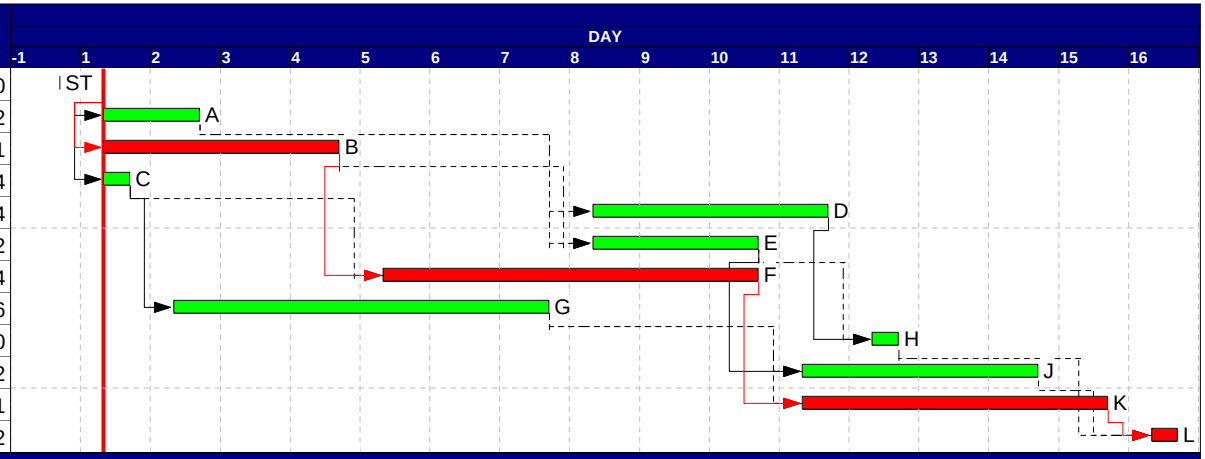
As Leveled by PACK
PACK Leveling Example

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF	R
5	ST	0	01JAN08	31DEC07	01JAN08	31DEC07	0	0	0
10	A	2d	01JAN08	02JAN08	07JAN08	08JAN08	5d	6d	2
15	B	4d	01JAN08	04JAN08	01JAN08	04JAN08	0	0	1
20	C	1d	01JAN08	01JAN08	04JAN08	04JAN08	0	3d	4
25	D	4d	08JAN08	11JAN08	11JAN08	14JAN08	0	3d	4
30	E	3d	08JAN08	10JAN08	09JAN08	11JAN08	0	1d	2
35	F	6d	05JAN08	10JAN08	05JAN08	10JAN08	0	0	4
40	G	6d	02JAN08	07JAN08	05JAN08	10JAN08	3d	3d	6
45	H	1d	12JAN08	12JAN08	15JAN08	15JAN08	3d	3d	0
50	J	4d	11JAN08	14JAN08	12JAN08	15JAN08	1d	1d	2
55	K	5d	11JAN08	15JAN08	11JAN08	15JAN08	0	0	1
60	L	1d	16JAN08	16JAN08	16JAN08	16JAN08	0	0	2



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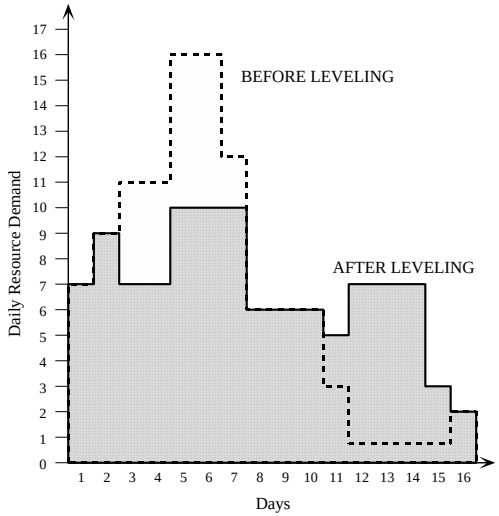
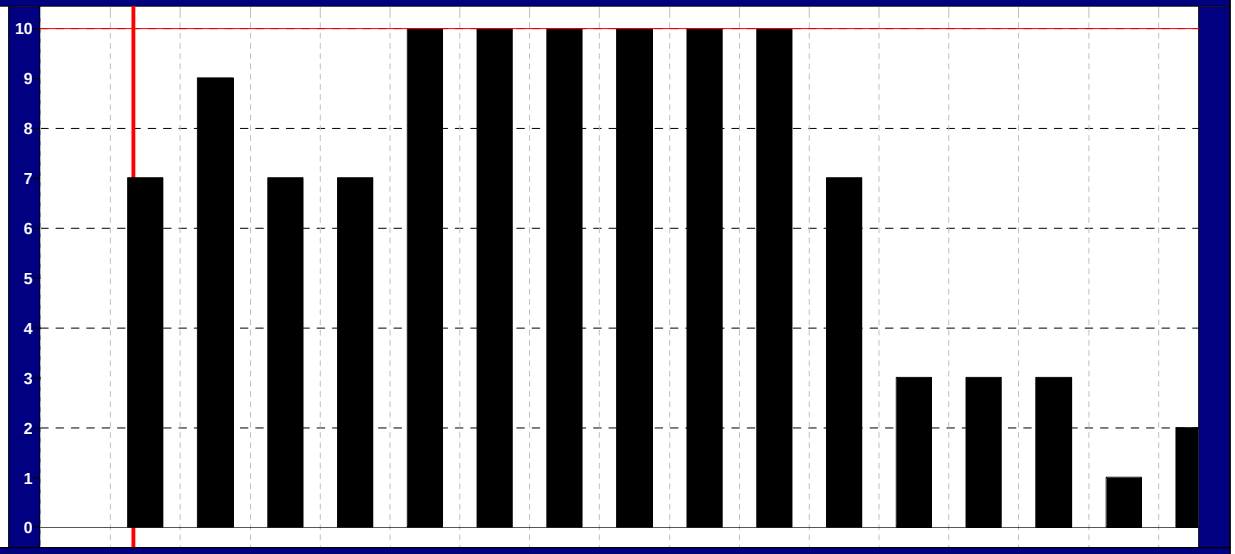
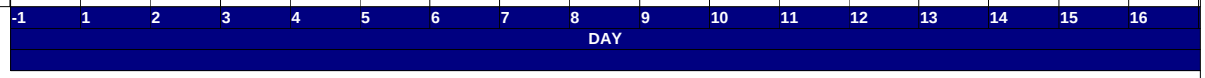




ID	Description	Units	Display: Quantity
RES1	Resource1		7 9 7 7 10 10 10 10 10 10 7 3 3 3 1 2



Start date	01JAN08
Finish date	16JAN08
Data date	01JAN08
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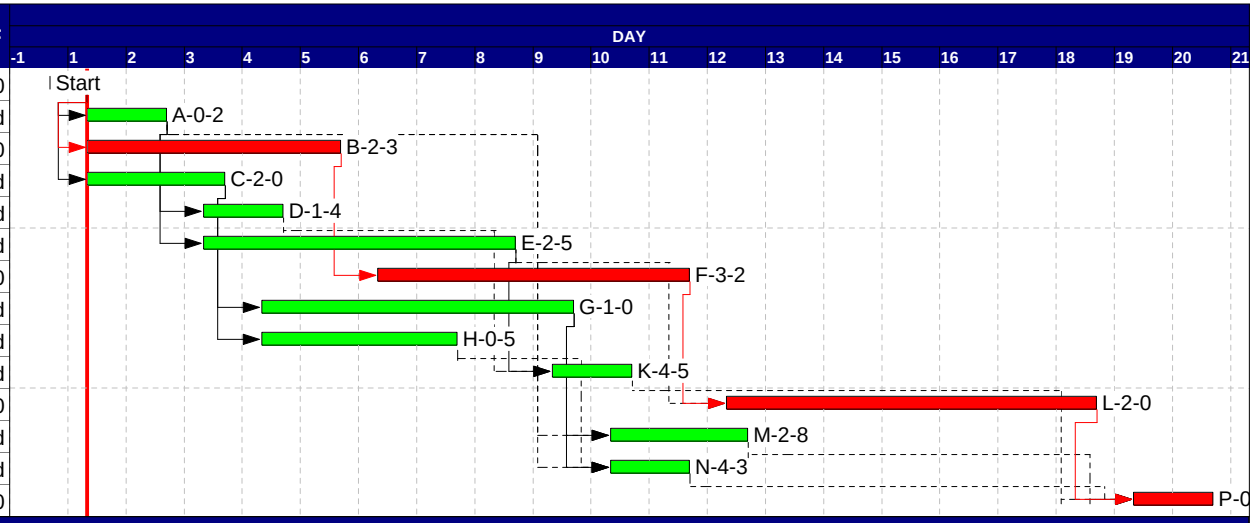
Leveling by SureTrak: R <= 10
PACK Leveling Example

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF
1000	Start	0	01JAN98	31DEC97	01JAN98	31DEC97	0	0
1005	A-0-2	2d	01JAN98	02JAN98	04JAN98	05JAN98	0	3d
1010	B-2-3	5d	01JAN98	05JAN98	01JAN98	05JAN98	0	0
1015	C-2-0	3d	01JAN98	03JAN98	07JAN98	09JAN98	0	6d
1020	D-1-4	2d	03JAN98	04JAN98	15JAN98	16JAN98	4d	12d
1025	E-2-5	6d	03JAN98	08JAN98	06JAN98	11JAN98	0	3d
1030	F-3-2	6d	06JAN98	11JAN98	06JAN98	11JAN98	0	0
1035	G-1-0	6d	04JAN98	09JAN98	10JAN98	15JAN98	0	6d
1040	H-0-5	4d	04JAN98	07JAN98	13JAN98	16JAN98	2d	9d
1045	K-4-5	2d	09JAN98	10JAN98	17JAN98	18JAN98	8d	8d
1050	L-2-0	7d	12JAN98	18JAN98	12JAN98	18JAN98	0	0
1055	M-2-8	3d	10JAN98	12JAN98	16JAN98	18JAN98	6d	6d
1060	N-4-3	2d	10JAN98	11JAN98	17JAN98	18JAN98	7d	7d
1065	P-0-0	2d	19JAN98	20JAN98	19JAN98	20JAN98	0	0



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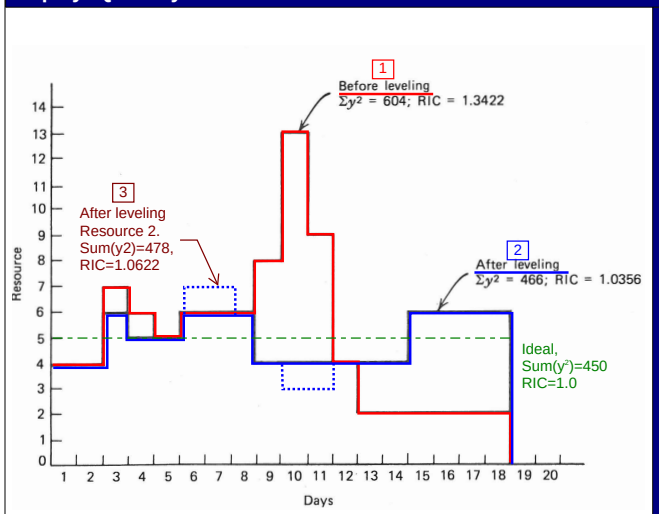

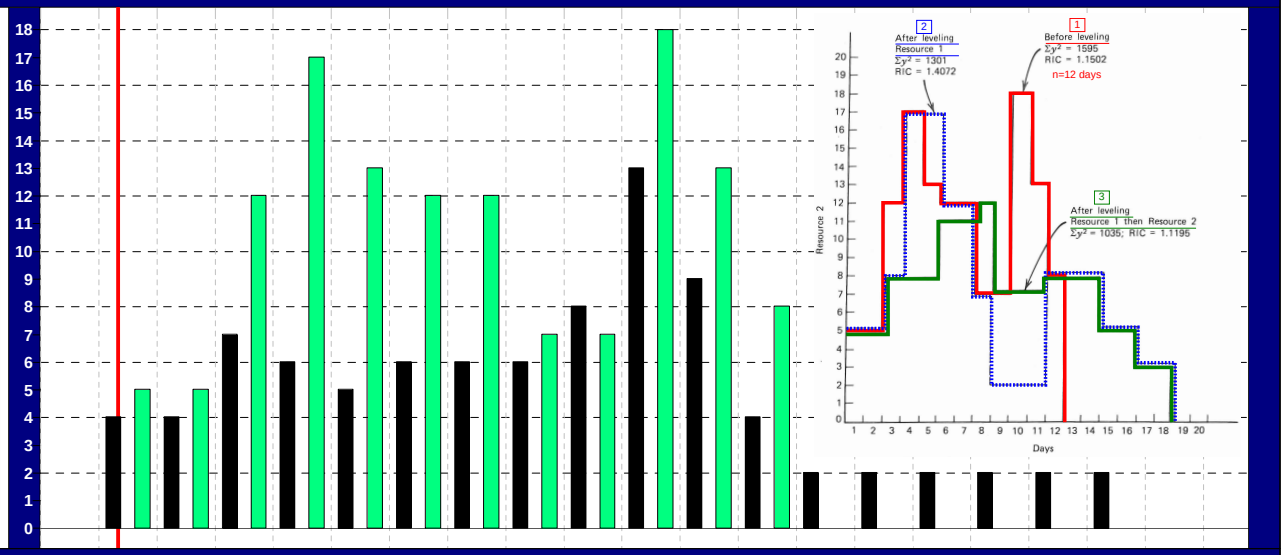

ID	Description	Units	Display: Quantity																				
RES1	Resource 1		4	4	7	6	5	6	6	6	8	13	9	4	2	2	2	2	2	2			
RES2	Resource 2		5	5	12	17	13	12	12	7	7	18	13	8									

-1 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
DAY

Start date	01JAN98
Finish date	20JAN98
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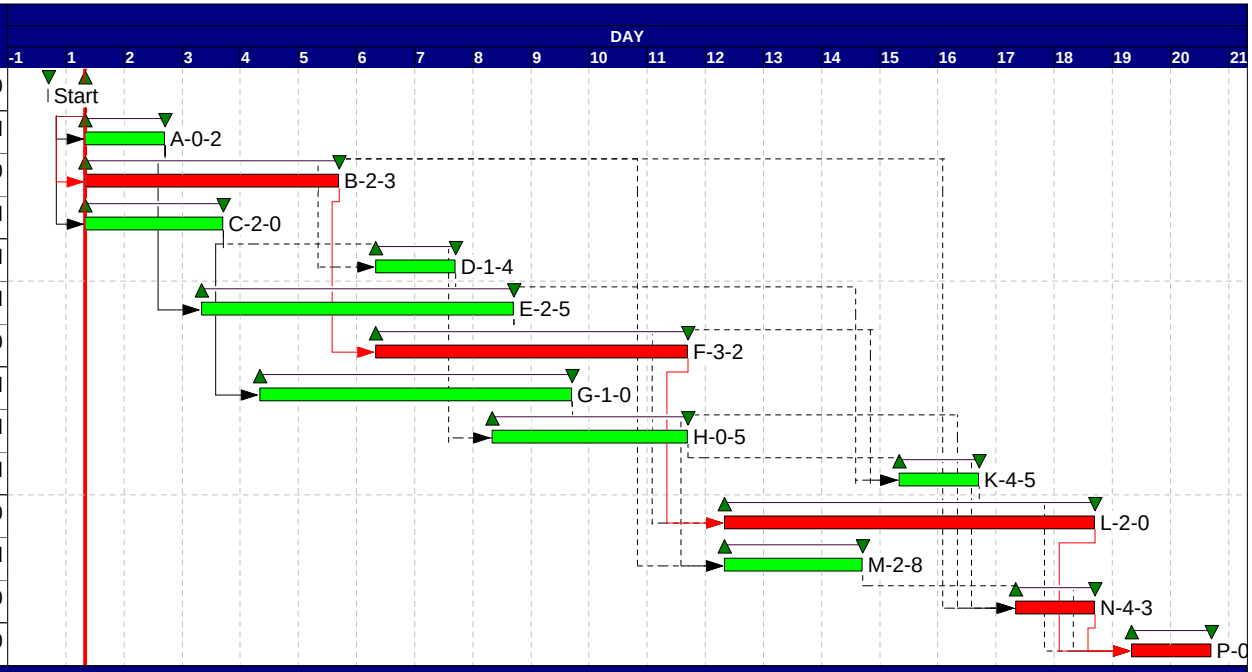
Early Start Resource Profile
Leveling Example Fig. 11.16

- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF
1000	Start	0	01JAN98	31DEC97	01JAN98	31DEC97	0	0
1005	A-0-2	2d	01JAN98	02JAN98	04JAN98	05JAN98	0	3d
1010	B-2-3	5d	01JAN98	05JAN98	01JAN98	05JAN98	0	0
1015	C-2-0	3d	01JAN98	03JAN98	07JAN98	09JAN98	0	6d
1020	D-1-4	2d	06JAN98	07JAN98	15JAN98	16JAN98	7d	9d
1025	E-2-5	6d	03JAN98	08JAN98	06JAN98	11JAN98	3d	3d
1030	F-3-2	6d	06JAN98	11JAN98	06JAN98	11JAN98	0	0
1035	G-1-0	6d	04JAN98	09JAN98	10JAN98	15JAN98	2d	6d
1040	H-0-5	4d	08JAN98	11JAN98	13JAN98	16JAN98	5d	5d
1045	K-4-5	2d	15JAN98	16JAN98	17JAN98	18JAN98	2d	2d
1050	L-2-0	7d	12JAN98	18JAN98	12JAN98	18JAN98	0	0
1055	M-2-8	3d	12JAN98	14JAN98	16JAN98	18JAN98	4d	4d
1060	N-4-3	2d	17JAN98	18JAN98	17JAN98	18JAN98	0	0
1065	P-0-0	2d	19JAN98	20JAN98	19JAN98	20JAN98	0	0



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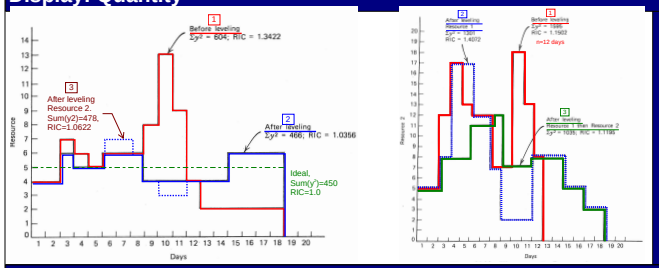
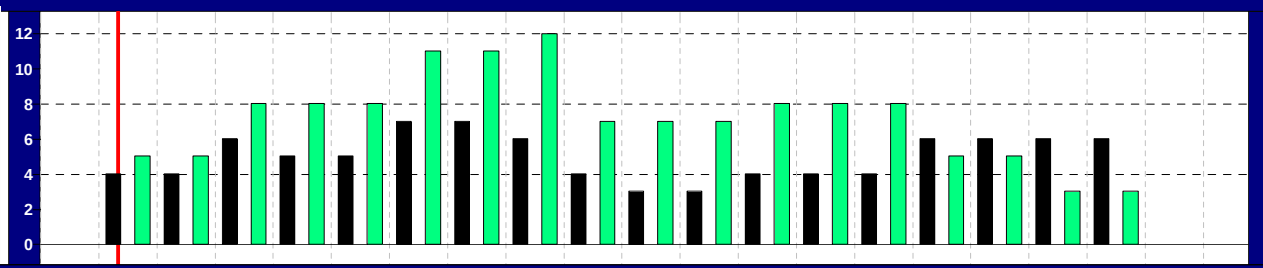
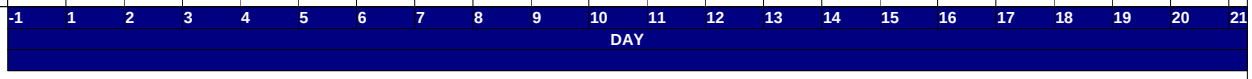




ID	Description	Units	Total	Display: Quantity																							
RES1	Resource 1		90		4	4	6	5	5	7	7	6	4	3	3	4	4	4	6	6	6	6				
RES2	Resource 2		129		5	5	8	8	8	11	11	12	7	7	7	8	8	8	5	5	3	3				
Total				0	9	9	14	13	13	18	18	18	11	10	10	12	12	12	11	11	9	9	0	0	*		



Start date	01JAN98
Finish date	20JAN98
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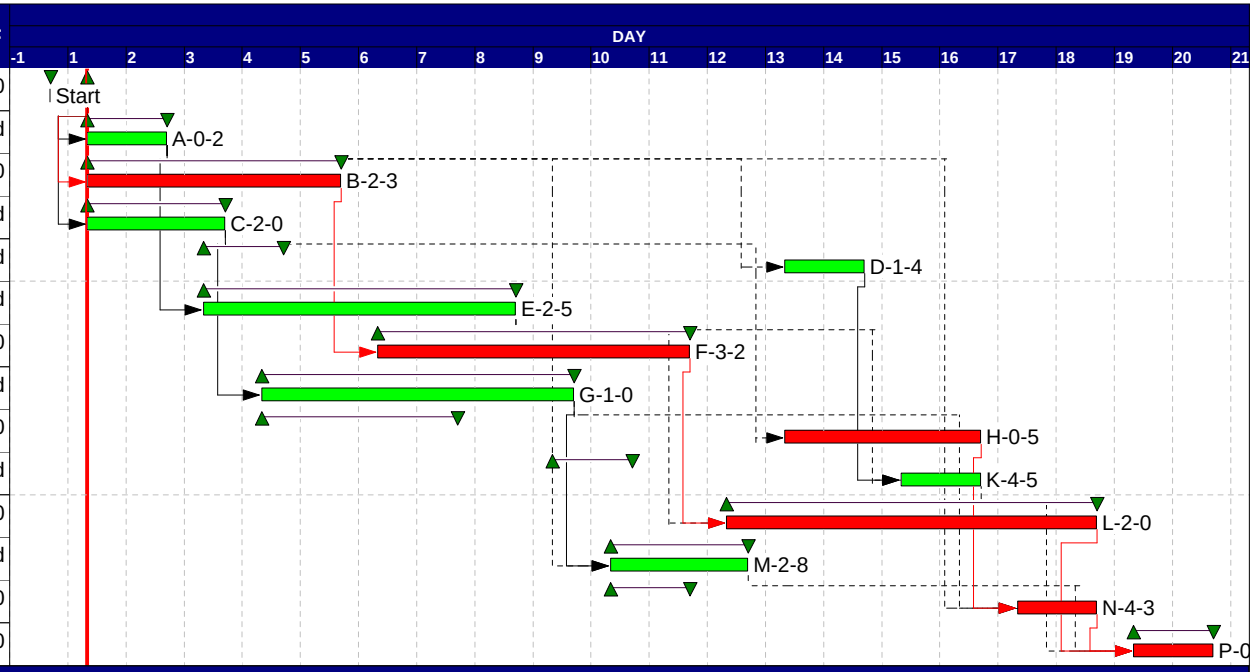
Minimum Moment Method

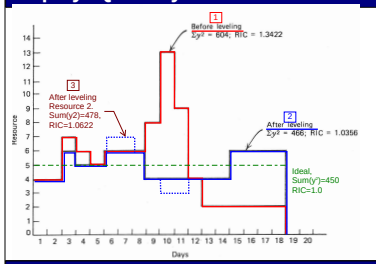
Level Res1 and then Res2
Leveling Example Fig. 11.16

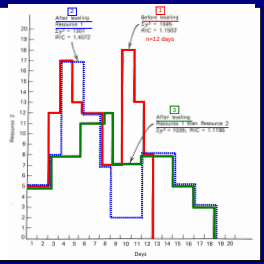
- Unleveled start point
- Unleveled finish point
- Unleveled bar
- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

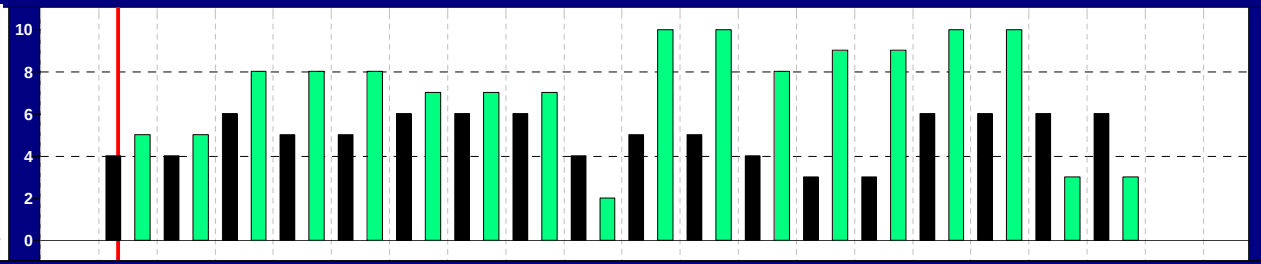
No	Act	T	ESD	EFD	LSD	LFD	FF	TF
1000	Start	0	01JAN98	31DEC97	01JAN98	31DEC97	0	0
1005	A-0-2	2d	01JAN98	02JAN98	04JAN98	05JAN98	0	3d
1010	B-2-3	5d	01JAN98	05JAN98	01JAN98	05JAN98	0	0
1015	C-2-0	3d	01JAN98	03JAN98	07JAN98	09JAN98	0	6d
1020	D-1-4	2d	13JAN98	14JAN98	15JAN98	16JAN98	0	2d
1025	E-2-5	6d	03JAN98	08JAN98	06JAN98	11JAN98	3d	3d
1030	F-3-2	6d	06JAN98	11JAN98	06JAN98	11JAN98	0	0
1035	G-1-0	6d	04JAN98	09JAN98	10JAN98	15JAN98	0	6d
1040	H-0-5	4d	13JAN98	16JAN98	13JAN98	16JAN98	0	0
1045	K-4-5	2d	15JAN98	16JAN98	17JAN98	18JAN98	2d	2d
1050	L-2-0	7d	12JAN98	18JAN98	12JAN98	18JAN98	0	0
1055	M-2-8	3d	10JAN98	12JAN98	16JAN98	18JAN98	6d	6d
1060	N-4-3	2d	17JAN98	18JAN98	17JAN98	18JAN98	0	0
1065	P-0-0	2d	19JAN98	20JAN98	19JAN98	20JAN98	0	0



Display: Quantity







ID	Description	Units	Total	Display: Quantity																							
RES1	Resource 1		90		4	4	6	5	5	6	6	6	4	5	5	4	3	3	6	6	6	6				
RES2	Resource 2		129		5	5	8	8	8	7	7	7	2	10	10	8	9	9	10	10	3	3				
Total				0	9	9	14	13	13	13	13	13	6	15	15	12	12	12	16	16	9	9	0	0	*		



Start date	01JAN98
Finish date	20JAN98
Data date	01JAN98
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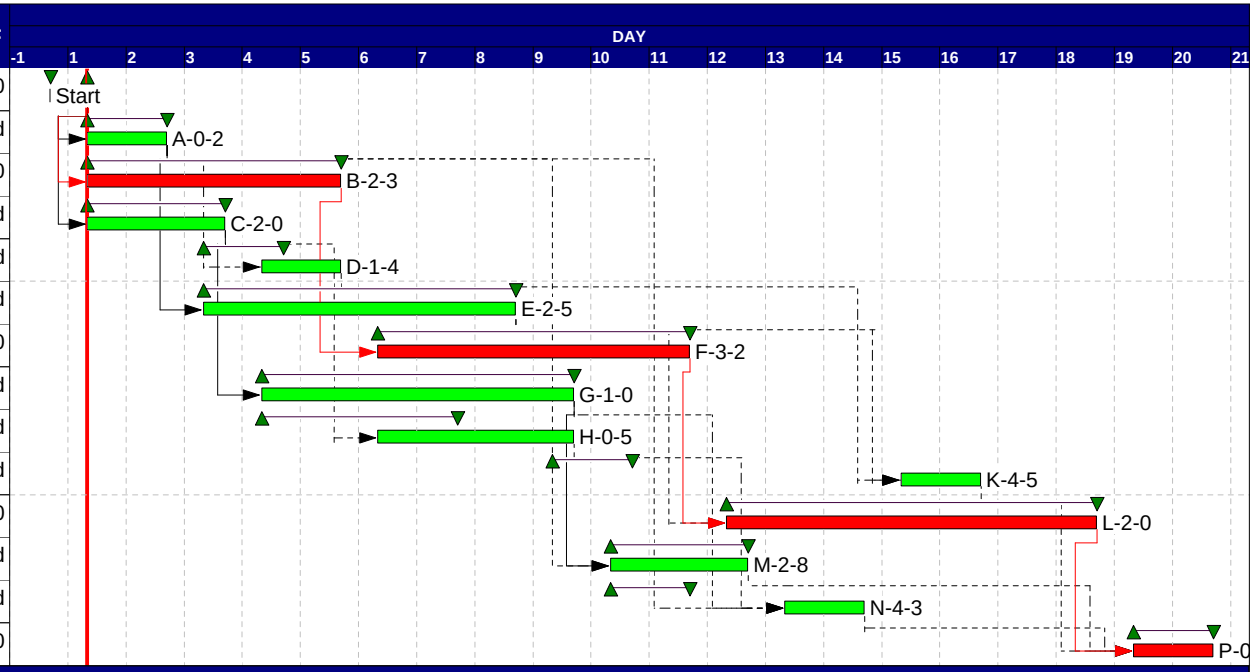
ST "Leveling": R1<=6, R2<=10

Leveling Example Fig. 11.16

- Unleveled start point
- Unleveled finish point
- Unleveled bar
- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point

No	Act	T	ESD	EFD	LSD	LFD	FF	TF
1000	Start	0	01JAN98	31DEC97	01JAN98	31DEC97	0	0
1005	A-0-2	2d	01JAN98	02JAN98	04JAN98	05JAN98	0	3d
1010	B-2-3	5d	01JAN98	05JAN98	01JAN98	05JAN98	0	0
1015	C-2-0	3d	01JAN98	03JAN98	07JAN98	09JAN98	0	6d
1020	D-1-4	2d	04JAN98	05JAN98	15JAN98	16JAN98	9d	11d
1025	E-2-5	6d	03JAN98	08JAN98	06JAN98	11JAN98	3d	3d
1030	F-3-2	6d	06JAN98	11JAN98	06JAN98	11JAN98	0	0
1035	G-1-0	6d	04JAN98	09JAN98	10JAN98	15JAN98	0	6d
1040	H-0-5	4d	06JAN98	09JAN98	13JAN98	16JAN98	3d	7d
1045	K-4-5	2d	15JAN98	16JAN98	17JAN98	18JAN98	2d	2d
1050	L-2-0	7d	12JAN98	18JAN98	12JAN98	18JAN98	0	0
1055	M-2-8	3d	10JAN98	12JAN98	16JAN98	18JAN98	6d	6d
1060	N-4-3	2d	13JAN98	14JAN98	17JAN98	18JAN98	4d	4d
1065	P-0-0	2d	19JAN98	20JAN98	19JAN98	20JAN98	0	0



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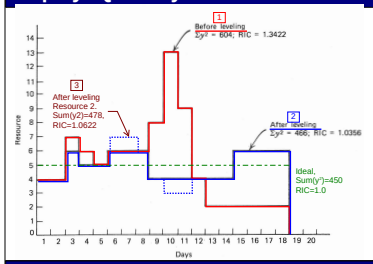

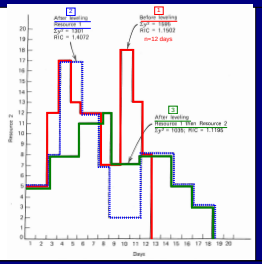

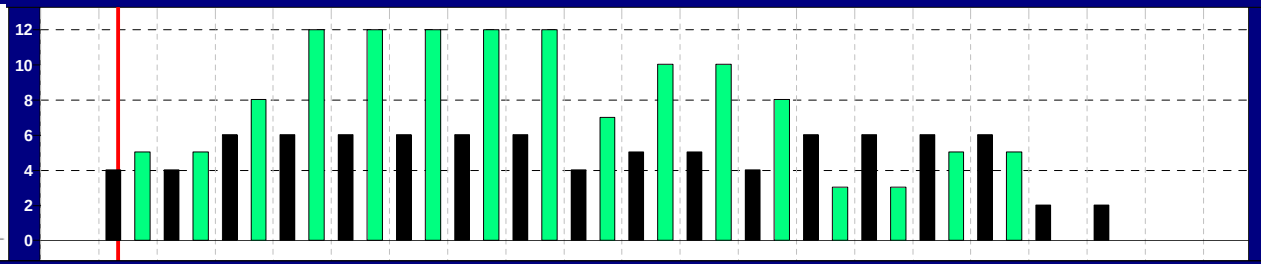

ID	Description	Units	Total	Display: Quantity																							
RES1	Resource 1		90		4	4	6	6	6	6	6	6	4	5	5	4	6	6	6	6	2	2					
RES2	Resource 2		129		5	5	8	12	12	12	12	12	7	10	10	8	3	3	5	5							
Total				0	9	9	14	18	18	18	18	18	11	15	15	12	9	9	11	11	2	2	0	0	*		



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ST "Leveling": R1<=6, R2<=12

Leveling Example Fig. 11.16

- Unleveled start point
- Unleveled finish point
- Unleveled bar
- Early bar
- Progress bar
- Critical bar
- Summary bar
- Start milestone point
- Finish milestone point