From: Halpin,Francis J
Sent: Thursday, September 23, 2004 4:24 PM
To: Oncken, Todd
Subject: WECC Payback formula

Todd:

In order to bring further clarity to yesterday's discussion concerning the payback formula NOT getting Inadvertent values to zero in 3 hours I put together a little spreadsheet model of the WECC formula determining the required payback value for the upcoming hour. I converted the results into a .pdf file and have attached it. Perhaps you could foreword it to the group.

Basically, it shows the effect of changing the value of the "H" parameter. I included results from setting H's of 3 (the current WECC value), 5, 2, 1.8, and 1.6. The general trend is that larger H's extend the payback; smaller ones get it paid back quicker. The current WECC value of 3 results in about 75% of the initial balance getting paid back after the third hour. An H value of 1.8 gets about 95% paid back in that timeframe.

This H factor is, therefore, something which can be adjusted to get more payback into close in hours; getting it returned closer to the time of accumulation. There are, as Howard pointed out yesterday, other formulas which accomplish this same type of effect. I am certain we can find an H value or new formula which meets the needs of the industry in this regard.

I also have the spreadsheet model which would allow folks to play around with other parameters in the WECC formula or the H factor to see their effect on the payback value and balance. I could send it if you think it would be useful.

Let me know if there is anything else I can do along these lines.

Thanks,

Fran

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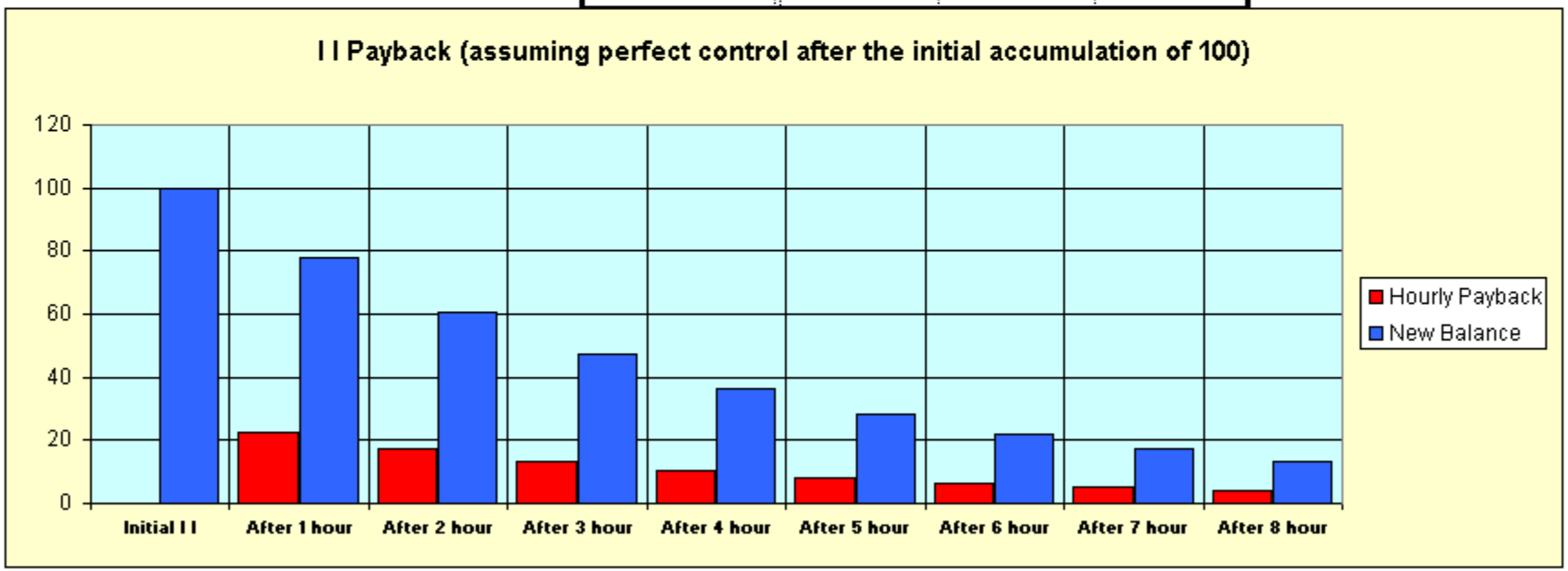
Beginning Balance	II	100
f Bias Factor (Bc/Bi)	Y	0.100
Hour Factor	H	5
Interconnection f Bias*	Bi	1972
Company f Bias*	Bc	197

*Bias Values shown as positive for ease of entry

P(MWh) = II / ((1-Y) * H)			
Hourly Payback	New Balance		% paid back
	100	Initial I I	
22	78	After 1 hour	22%
17	60	After 2 hour	40%
13	47	After 3 hour	53%
10	37	After 4 hour	63%
8	28	After 5 hour	72%
6	22	After 6 hour	78%
5	17	After 7 hour	83%
4	13	After 8 hour	87%

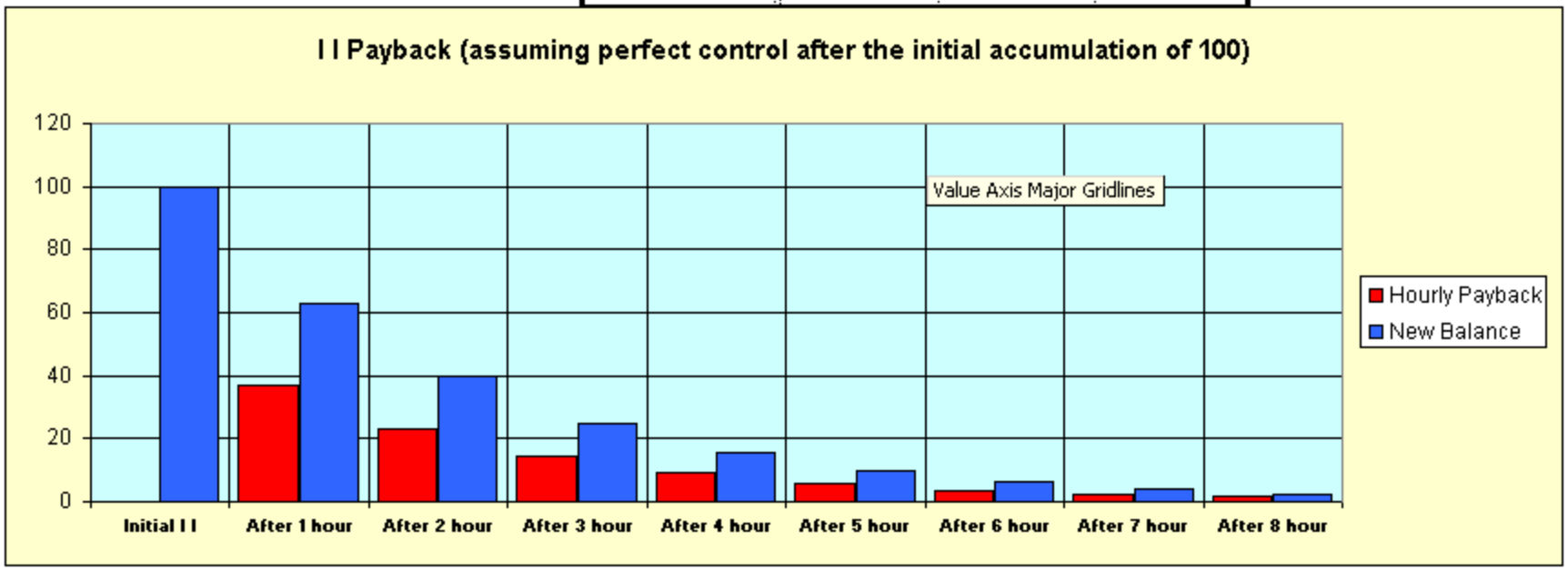


Hourly Payback and Balances for H= 5.0

Beginning Balance	II	100
f Bias Factor (Bc/Bi)	Y	0.100
Hour Factor	H	3
Interconnection f Bias*	Bi	1972
Company f Bias*	Bc	197

*Bias Values shown as positive for ease of entry

P(MWh) = II / ((1-Y) * H)			
Hourly Payback	New Balance		% paid back
	100	Initial I I	
37	63	After 1 hour	37%
23	40	After 2 hour	60%
15	25	After 3 hour	75%
9	16	After 4 hour	84%
6	10	After 5 hour	90%
4	6	After 6 hour	94%
2	4	After 7 hour	96%
1	2	After 8 hour	98%

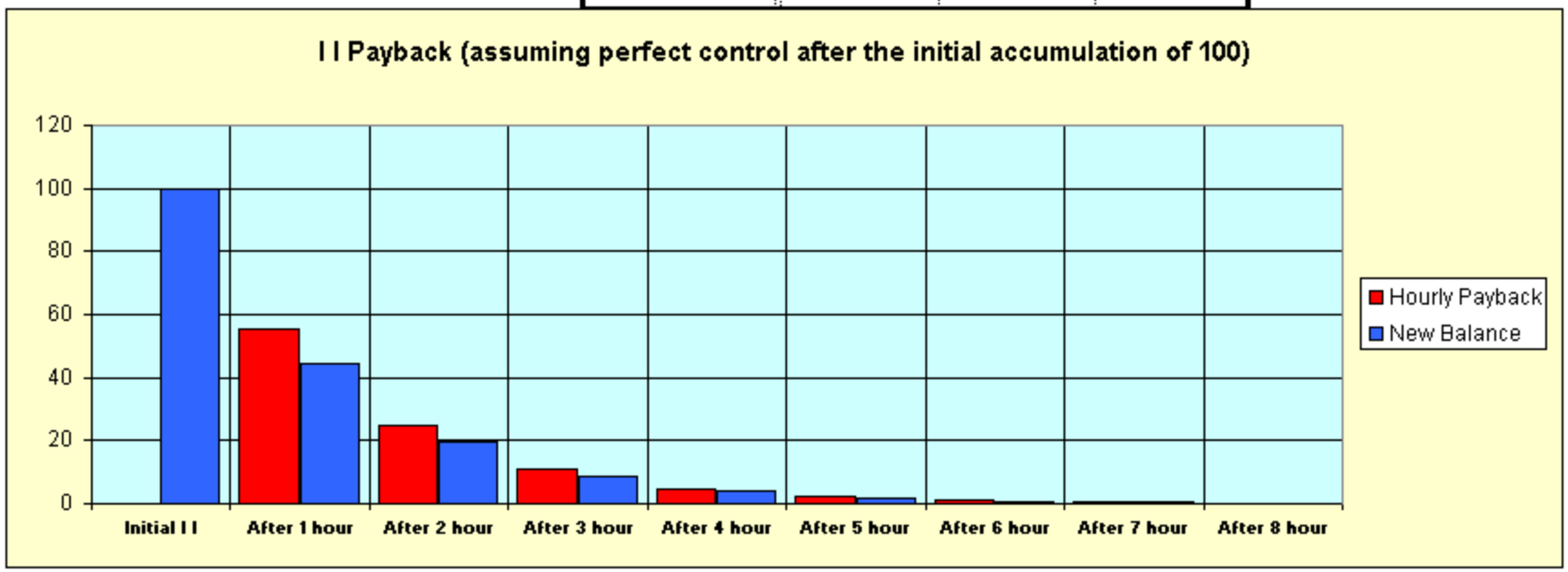


Hourly Payback and Balances for H= 3.0

Beginning Balance	II	100
f Bias Factor (Bc/Bi)	Y	0.100
Hour Factor	H	2
Interconnection f Bias*	Bi	1972
Company f Bias*	Bc	197

*Bias Values shown as positive for ease of entry

P(MWh) = II / ((1-Y) * H)			
Hourly Payback	New Balance		% paid back
	100	Initial I I	
56	44	After 1 hour	56%
25	20	After 2 hour	80%
11	9	After 3 hour	91%
5	4	After 4 hour	96%
2	2	After 5 hour	98%
1	1	After 6 hour	99%
0	0	After 7 hour	100%
0	0	After 8 hour	100%

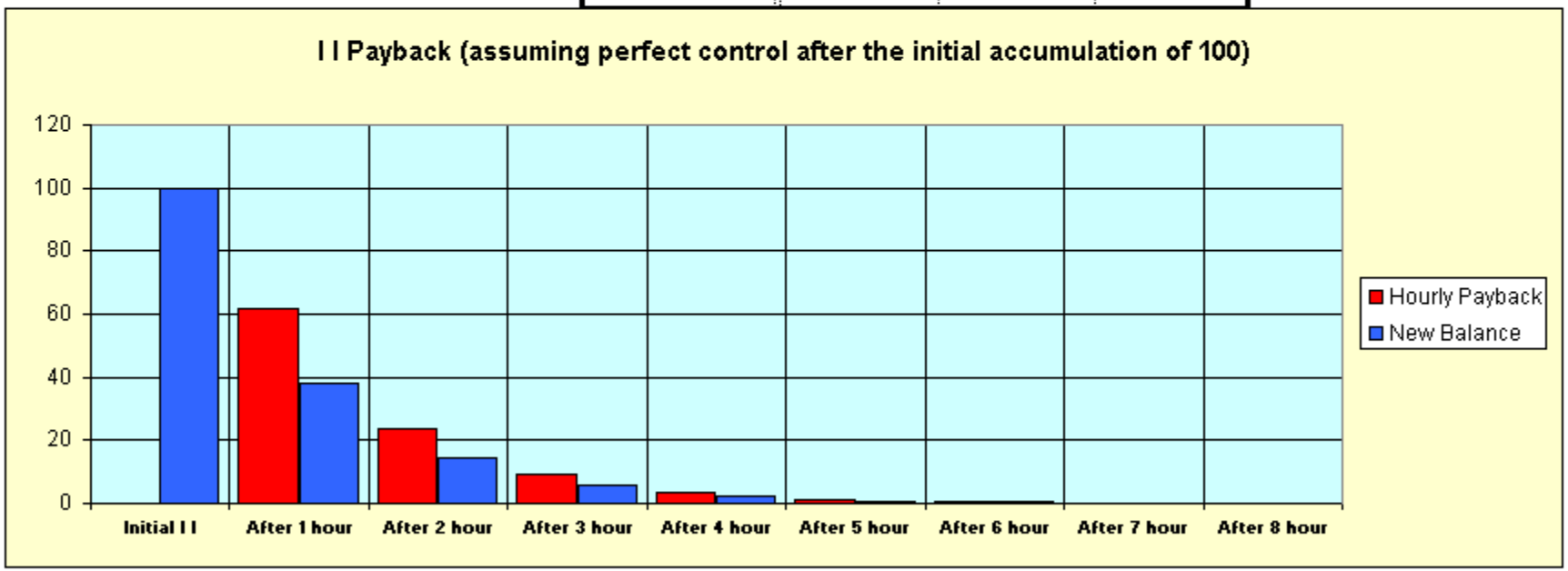


Hourly Payback and Balances for H= 2.0

Beginning Balance	II	100
f Bias Factor (Bc/Bi)	Y	0.100
Hour Factor	H	1.8
Interconnection f Bias*	Bi	1972
Company f Bias*	Bc	197

*Bias Values shown as positive for ease of entry

P(MWh) = II / ((1-Y) * H)			
Hourly Payback	New Balance		% paid back
	100	Initial I I	
62	38	After 1 hour	62%
24	15	After 2 hour	85%
9	6	After 3 hour	94%
3	2	After 4 hour	98%
1	1	After 5 hour	99%
1	0	After 6 hour	100%
0	0	After 7 hour	100%
0	0	After 8 hour	100%

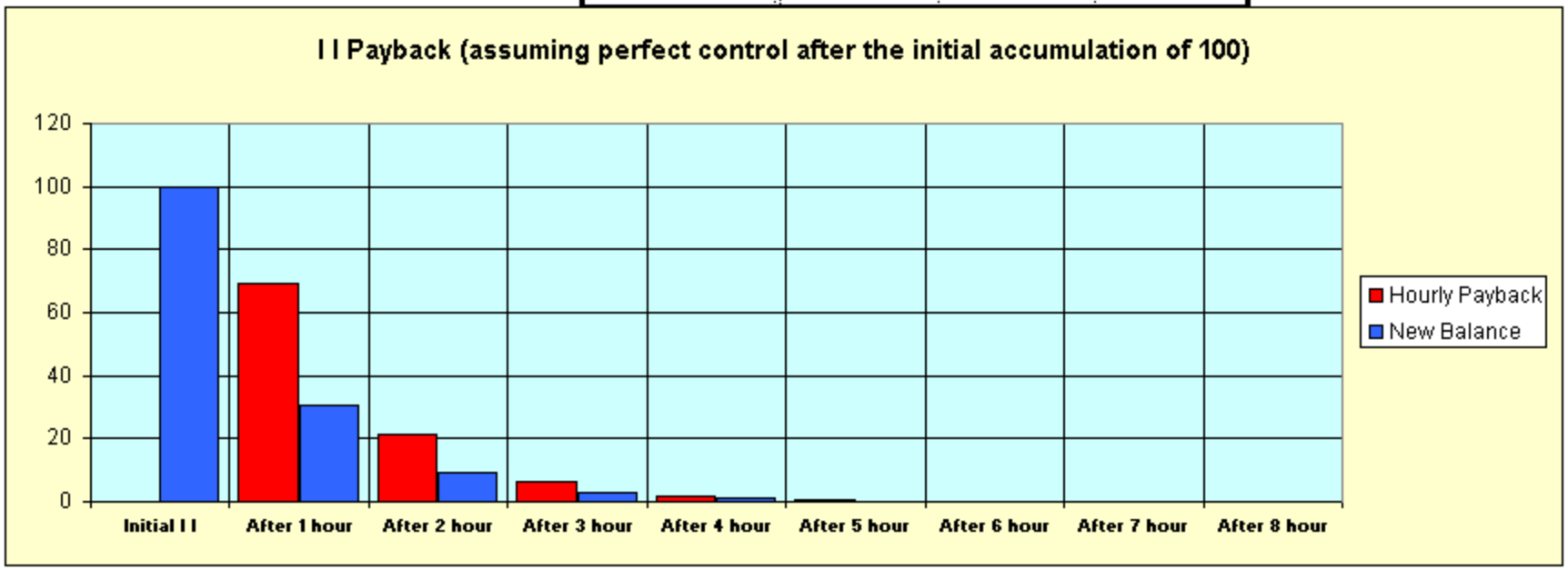


Hourly Payback and Balances for H= 1.8

Beginning Balance	II	100
f Bias Factor (Bc/Bi)	Y	0.100
Hour Factor	H	1.6
Interconnection f Bias*	Bi	1972
Company f Bias*	Bc	197

*Bias Values shown as positive for ease of entry

P(MWh) = II / ((1-Y) * H)			
Hourly Payback	New Balance		% paid back
	100	Initial I I	
69	31	After 1 hour	69%
21	9	After 2 hour	91%
6	3	After 3 hour	97%
2	1	After 4 hour	99%
1	0	After 5 hour	100%
0	0	After 6 hour	100%
0	0	After 7 hour	100%
0	0	After 8 hour	100%



Hourly Payback and Balances for H= 1.6