

Black Start Issues

OC

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IMM



Monitoring Analytics

Black Start Issues

- **CRF: capital recovery factor**
 - **A rate, multiplied by the investment, which provides for a return on and of capital over a defined time period**
 - **CRFs are calculated using a standard financial model that accounts for the weighted average cost of capital and its components, including depreciation and taxes.**
 - **For example, a five year CRF will allow the recovery of 100 percent of the investment plus a return over five years.**

CRF History

- **The CRF table was created in 2007 as part of the new RPM capacity market design**
 - **The CRF table provided for the accelerated return of incremental investment in capacity resources based on concerns about the fact that some old units would be making substantial investments related to pollution control.**
 - **The same CRF table was used in the black start rules.**
 - **The CRF table includes assumptions that are no longer correct. The CRF values are significantly too high.**
 - Tax depreciation rules
 - Corporate tax rate

Original CRF Table

- Original CRF table created in 2007

Age of Black Start Unit	Term of Black Start Unit	Levelized CRF
1 to 5	20	0.125
6 to 10	15	0.146
11 to 15	10	0.198
16+	5	0.363

Revised CRF Table

- Same rows as original CRF table but CRF values based on current tax code. Same column headers.

Age of Black Start Unit	Term of Black Start Unit	Levelized CRF
1 to 5	20	0.085
6 to 10	15	0.101
11 to 15	10	0.134
16+	5	0.235

CRF Issues

- **CRF table column header: Term of black start commitment**
 - **This is misleading and incorrect**
 - **The column is simply the cost recovery period**
 - **Accelerated recovery reduces risk to black start units and should not be the basis for a shorter commitment**
 - **Full payment of all costs of black start investment should require commitment for life of unit**
- **No need for such short recovery periods for black start**
- **Two periods, based on unit age, are more than adequate.**

IMM Proposed CRF Table

- **Two age categories for units where black start investment is made. Second column is cost recovery period.**

Age of Black Start Unit	Black Start Cost Recovery Period	Levelized CRF
1 to 10	20	0.085
Greater than 11	10	0.134

CRF Implementation Issues

- **CRF values have overcompensated black start units following changes to the tax code in 2017.**
 - **Depreciation rules allow more accelerated depreciation.**
 - **Reduced corporate tax rate to 21 percent.**
- **Black start units going into service currently are being overcompensated**
 - **The new CRF rates should apply to units going into service this year.**
 - **There are five black start units going into service this year.**

CRF Implementation Issues

- **Overcompensation amounts vary with the project investment and the CRF recovery period.**
- **For a new black start unit with an investment of \$21M, the overcompensation is:**
 - **\$840,000 per year**
 - **\$16,800,000 over the recovery period**
- **For an existing black start unit with an investment of \$21M, the overcompensation is:**
 - **\$2,688,000 per year**
 - **\$13,440,000 over the recovery period**

Annual Difference

Example	Old CRF Rate	New CRF Rate	Project Investment	Old Annual Revenue Requirement	New Annual Revenue Requirement	Annual Difference
1	0.125	0.085	\$9,000,000	\$1,125,000	\$765,000	\$360,000
2	0.125	0.085	\$15,000,000	\$1,875,000	\$1,275,000	\$600,000
3	0.125	0.085	\$21,000,000	\$2,625,000	\$1,785,000	\$840,000
1	0.146	0.101	\$9,000,000	\$1,314,000	\$909,000	\$405,000
2	0.146	0.101	\$15,000,000	\$2,190,000	\$1,515,000	\$675,000
3	0.146	0.101	\$21,000,000	\$3,066,000	\$2,121,000	\$945,000
1	0.198	0.134	\$9,000,000	\$1,782,000	\$1,206,000	\$576,000
2	0.198	0.134	\$15,000,000	\$2,970,000	\$2,010,000	\$960,000
3	0.198	0.134	\$21,000,000	\$4,158,000	\$2,814,000	\$1,344,000
1	0.363	0.235	\$9,000,000	\$3,267,000	\$2,115,000	\$1,152,000
2	0.363	0.235	\$15,000,000	\$5,445,000	\$3,525,000	\$1,920,000
3	0.363	0.235	\$21,000,000	\$7,623,000	\$4,935,000	\$2,688,000



Lifetime Difference

Example	Old CRF Rate	New CRF Rate	Project Investment	Old CRF Lifetime Recovery	New CRF Lifetime Recovery	Lifetime Difference
1	0.125	0.085	\$9,000,000	\$22,500,000	\$15,300,000	\$7,200,000
2	0.125	0.085	\$15,000,000	\$37,500,000	\$25,500,000	\$12,000,000
3	0.125	0.085	\$21,000,000	\$52,500,000	\$35,700,000	\$16,800,000
1	0.146	0.101	\$9,000,000	\$19,710,000	\$13,635,000	\$6,075,000
2	0.146	0.101	\$15,000,000	\$32,850,000	\$22,725,000	\$10,125,000
3	0.146	0.101	\$21,000,000	\$45,990,000	\$31,815,000	\$14,175,000
1	0.198	0.134	\$9,000,000	\$17,820,000	\$12,060,000	\$5,760,000
2	0.198	0.134	\$15,000,000	\$29,700,000	\$20,100,000	\$9,600,000
3	0.198	0.134	\$21,000,000	\$41,580,000	\$28,140,000	\$13,440,000
1	0.363	0.235	\$9,000,000	\$16,335,000	\$10,575,000	\$5,760,000
2	0.363	0.235	\$15,000,000	\$27,225,000	\$17,625,000	\$9,600,000
3	0.363	0.235	\$21,000,000	\$38,115,000	\$24,675,000	\$13,440,000



CRF Substitution Issues

- **Substitution of a black start unit should be permitted only under very specific circumstances and with defined conditions**
- **A second unit at the same location, connected to the same bus.**
- **Review of costs of old and new units to ensure no overpayment**
 - **Cost reductions possible**

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