# Comparison of DCP 206 with transmission charging ICRP

by Franck Latrémolière on Thursday 24 July 2014

* 1. A power station in Springfield feeds a double 100 MVA circuit from Springfield to Shelbyville. The firm capacity of 100 MVA is fully used. To meet new demand of 56 MW in Shelbyville, an additional genset in Springfield and a third circuit (raising the firm transfer capacity to 200 MVA) are under construction. The distance is 10 miles. The cost of building a new circuit is $2 million per mile, i.e. $20 million.
	2. If National Grid’s ICRP methodology was applicable, with a security factor of 1.8, charges would be calculated on the basis of a expansion capital cost of $36/kVA/mile. Assume a rate of return of 5 per cent, and assume that the reference node on the network is half way between Springfield and Shelbyville, then we have a charge of $9/kVA/year plus/minus scaling for Springfield generation, a charge of $9/kVA/year plus scaling for Shelbyville demand, and a credit of $9/kVA/year minus/plus scaling for Shelbyville generation. Prices are the same before and after the upgrade project. Someone who purchases 56 MW at the plant gate from the new Springfield genset and uses that power to supply customers in Shelbyville will be paying $1 million a year plus scaling. The existing 100 MW in Shelbyville pays $1.8 million a year plus scaling in all cases. Network revenue after the upgrade is $2.8 million plus scaling.
	3. If the EDCM as modified by DCP 206 (to remove FCP and LRIC from demand tariffs) was applicable, then the main element of the charges would be applied to demand (EDCM generation capacity charges are almost negligible). The primary basis of calculation is a 500 MW model and network use factors. Because of a lack of transparency, we do not how things work in practice, so we make assumptions. Say that the relevant level in the 500 MW model is based on radial double circuits averaging 5 miles in route length, so that the 500 MW model costs $100 million i.e. $200/kW. Before the upgrade, 100 MW of Shelbyville demand share $40 million worth of circuits, so the network use factor is 2 (as expected: the route length is double the 500 MW model assumption). After the upgrade, 156 MW of Shelbyville demand share $60 million MEAV, so the network use factor is 1.92. Assume that the only element of EDCM charges is a 5 per cent asset scaler. Then the current 100 MW in Shelbyville are paying $2 million (100,000\*2\*200\*5%), and after the upgrade the 156 MW in Shelbyville are paying $3 million (156,000\*1.92\*200\*5%).

If a pre-DCP 206 EDCM was applicable, the asset scaler would be lower, say 4 per cent. Before the upgrade, the LRIC or FCP number is high since there is an imminent reinforcement. Say that a LRIC cap of $20/kVA/year applies (cap of $2 million a year based on $40 million of assets, spread across 100 MVA). The charge before the upgrade is $20/kVA/year from LRIC plus $16/kVA/year from network use factors, i.e. $36/kVA/year, or $3.6 million across the Shelbyville demand of 100 MW. This is an excessive charge for the use of $40 million worth of assets; the overcharge arises from the fact that existing Shelbyville customers are forced to contribute towards the costs of an upgrade that they do not need. After the upgrade, the likely FCP or LRIC number is zero or negligible, since there is spare capacity on the upgraded triple-circuit line: with a 1.92 network use factor the post-upgrade charge comes to $15.4/kVA/year, i.e. $2.4 million on the whole 156 MW of Shelbyville demand.

Table 1 Comparison of results between the three methodologies

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| --- | --- | --- | --- |
|  | ICRPwithout scaling | Post-DCP 206 simplified EDCM | Pre-DCP 206 simplified EDCM |
| *Before the network upgrade* |
|  | ICRPwithout scaling | Post-DCP 206 simplified EDCM | Pre-DCP 206 simplified EDCM |
| Network MEAV before the upgrade | $40 million | $40 million | $40 million |
| Network charge before the upgrade | $18.0/kVA/year | $20.0/kVA/year | $36.0/kVA/year |
| Network revenue before the upgrade | $1.8 million/year | $2.0 million/year | $3.6 million/year |
| Return on MEAV before the upgrade | 4.5% | 5.0% | 9.0% |
| *After the network upgrade* |
|  | ICRPwithout scaling | Post-DCP 206 simplified EDCM | Pre-DCP 206 simplified EDCM |
| Network MEAV after the upgrade | $60 million | $60 million | $60 million |
| Network charge after the upgrade | $18.0/kVA/year | $19.2/kVA/year | $15.4/kVA/year |
| Network revenue after the upgrade | $2.8 million/year | $3.0 million/year | $2.4 million/year |
| Return on MEAV after the upgrade | 4.7% | 5.0% | 4.0% |
| *Impact of the network upgrade* |
|  | ICRPwithout scaling | Post-DCP 206 simplified EDCM | Pre-DCP 206 simplified EDCM |
| Amount invested in network upgrade | $20 million | $20 million | $20 million |
| Additional return from upgrade | $1.0 million | $1.0 million | ($1.2 million) |
| Rate of return on upgrade project | 5.0% | 5.0% | Minus 6.0% |
| Impact of the upgrade on charges for existing customers | No change | 4% reduction | 57% reduction |
| *Verdict* |
|  | ICRPwithout scaling | Post-DCP 206 EDCM | Pre-DCP 206 EDCM |
| Overall impression | Sane | Sane | Not sane |