*Innovation Competitions - Full Submission*

*Supplementary Answer Form*

Tick if this answer has been provided verbally:

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| Project code | ENWT206 | Question Number | Q33 |
| Question date | 14 August 2014 | Answer date | 18 August 2014 |
| Submission section question relates to | Appendix A | | |
| Topic | Benefits case | | |
| Question | Figure A2.1, pg 55, shows that each intervention releases the same capacity, but at different costs. Please confirm that this is the case as this does not intuitively feel correct. If this is correct, why not always only use Adaptive Protection as it's the cheapest? What would make the other methods more desirable than Adaptive Protection? | | |
| Notes on question |  | | |
| Answer | The application of each mitigation technique does release the same capacity at different costs. We do recognise that on paper it appears that Adaptive Protection is the method of choice but there are technical considerations which precludes the use of apdative protection in all cases.  In Section 2.2 of the Full Submission we describe three fault level ratings which can be exceeded by the increase in demand and generation on the network, namely through fault withstand, breaking capacity and making capacity. Making capacity can be managed operationally using alternative switching arrangements so the FLARE techniques are aimed at managing through fault withstand and breaking capacity.  Adaptive Protection can actively manage the breaking capacity by operating alternative circuit breakers first thereby reducing the fault current to a level below the rating. The process for Adaptive Protection can result in a fault remaining on the system for longer which may lead to a breach in the through fault withstand rating. For this reason it is not appropriate to use Adaptive Protection for cases where the through fault withstand rating is exceeded.  The IS-limiter, due to its fast acting operation, can be used to actively manage both through fault withstand and breaking capacity as the fault current is reduced within 1millisecond allowing the circuit breakers to interrupt a current well within their ratings and in normal protection operating times.  To allow the most economic management of all aspects of fault level it is important to have this range of techniques available. | | |
| Attachments |  | | |