

LCN Fund Full Submission

Supplementary Answer Form

Tick if this answer is Confidential: ☐

Tick if this answer has been provided verbally: ☐

Project code:	ENWT205	Question Number	3
Question date	20 August 2013	Answer date	22 August 2013
Submission section question relates to	Section 2: Project Description		
Topic	Equipment		
Question	What impact will interconnected networks have on fault levels and how will this be addressed?		
Notes on question			
Answer	<p>The effect of interconnected networks is to increase the system fault level on the LV feeders and it is indeed this effect that assists in improving power quality and other factors. However the fault duty faced by any given network fuse is not increased.</p> <p>On the interconnected LV feeders the fuses will be replaced by WEEZAPs. The design and rating of the WEEZAP enables it to operate across the range of fault levels indicated by our modelling.</p> <p>Our modelling shows that the increase in fault level is significantly attenuated by service cables and hence there is little material increase in the fault level within a customer's property.</p> <p>TNEI conducted a study on our behalf using a generic network model including 33kV, 11kV and LV network voltage levels with 500kVA distribution transformers and LV feeders of varying lengths with point loads to represent the consumers. Their modelling showed that for a radial LV network the fault level on the LV busbars at the distribution substation was around 7kA. If two feeders on the same substation are interconnected the change in fault level is negligible. If two feeders from different substations are interconnected the fault level increases to 9kA.</p> <p>Electricity North West's design fault level for the LV network is 27kA and specifies the design prospective short circuit current at a customer's supply terminals as 16kA. Domestic fuses must comply with BS1361 which quotes the breaking capacity for a Type II fuse as 33kA.</p> <p>Using the information from the modelling and our design criteria we can confirm that all domestic fuses are maintained within their rating and all Electricity North West's</p>		

	<p>LV assets will be maintained within their design rating.</p> <p>British Standard 1362 quotes the breaking capacity for a 13 amp fuse within a domestic appliance as 6kA ie the maximum current that can safely be interrupted by the fuse. The fault level seen at the domestic premises is severely attenuated from the distribution substation busbars to the customer's premises by the impedance of the LV network cables. If the fault level at the distribution substation is 9kA then the length of LV mains and service cable to a customer's supply terminals plus the length of wiring within the customer's property will attenuate the fault level to within the design breaking capacity of the fuse; meaning that the 13 amp fuse will safely operate for a fault in the appliance or on the wiring to the appliance.</p>
Attachments	
Verbal Clarifications (Consultants)	