

Docket Number 06-SPPE-2
First Round Data Requests
El Centro Unit 3 Repower Project
July 2006

DATA REQUEST #18
TRANSMISSION SYSTEM ENGINEERING

BACKGROUND

The SPPE's short circuit study states,

“...92 kV circuit breakers with a 63kA interrupting rating should be used for the ECGS Unit #3 interconnection. Future system expansion plans will result in a further increase of the short circuit duty.”

Staff is concerned that breaker ratings may or may not be adequate for symmetrical faults (three-phase faults) depending on the aging and present condition of the existing breakers, and for asymmetrical faults (line-to-ground faults) existing breaker ratings (40,000 Amps) may not meet industry standards or American National Standards. Staff is also not confident that the System Impact Study included a complete transient stability study and post-transient voltage analysis.

DATA REQUEST

18. The short circuit study report shows that post-project symmetrical fault level (37,028 Amps) at the El Centro switching station 92 kV bus would be about 93 percent of the breaker interrupting ratings (40,000 Amps). Similarly at the Euclid substation the post-project fault current was 19,314 Amps, about 97 percent of the breaker interrupting rating of 20,000 Amps. Please verify and explain why IID considers that the existing 92 kV breakers at the El Centro switching station or at the Euclid substation should be adequate for the post-project fault levels, symmetrical or asymmetrical, or whether there are any future plans, including the schedule, for reduction of fault levels or replacement of the breakers with higher interrupting ratings.

DATA RESPONSE

The ANSI/IEEE standards specify that circuit breakers are rated on a symmetrical current basis for X/R ratios less than, or equal to, seventeen (17). An X/R ratio of 17 corresponds to a time constant of the DC component of the short circuit current of 45 msec.

In conducting the breaker capability study, the X/R ratio for all fault locations was examined. In the case of El Centro Switching Station and Euclid Substation, the X/R ratios were found to be 14.99 and 8.06, respectively, meaning that in both cases, symmetrical fault current values could be used for comparison against the interrupting ratings.

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A review of the fault current exposure to interrupting rating ratios for the EI Centro Switching Station equipment and the Euclid Substation equipment revealed that these values were 93% and 97%, respectively. Since these values were less than 100%, it was concluded that the equipment will be operating within its design specifications and will be able to interrupt the fault current levels documented for each of the pieces of equipment.

Since all of the equipment will be operating within its respective interrupting ratings, no plans to replace any of the equipment or to reduce the fault current levels have been formulated. However, it is IID's practice to continuously study its electrical system and determine if modifications to the system are required and/or justified.