

TIP SHEET

POWER TRANSFORMER ARC FLASH SOLUTIONS

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Larger factories, such as pulp, paper and steel mills, can frequently have arc flash incident energy calculations above 40 cal/cm² for equipment connected directly to the secondary side of power transformers. Most companies use this value as the upper limit for energized work; consequently they must now insist on outages to perform routine tasks on this equipment. When the equipment is switchgear feeding large processes, the downtime cost of a task such as racking in and closing a power circuit breaker can be tens of thousands of dollars. They are in search of a convenient and economical solution to reduce these arc flash energies to a manageable level.

Part of the cause of high arc flash energies is that fuse sizing is often found near the upper limit identified in article NEC 450.3. The larger sizes easily ensure that magnetizing inrush currents of the transformer do not cause nuisance openings and that there is good coordination with secondary over current protective devices. Fuses of these ampere ratings will be current-limiting for primary faults but will have extremely long clearing times for secondary arcing faults (causing high arc flash energy).

When using a smaller ampere rating of the same fuse type is not enough to adequately reduce arc flash energies it can be useful to consider other fuse types. In some cases, it is possible to reduce energies below 20 cal/cm² and maintain reliable operation by using a fuse with different time current characteristics.

When selecting a new primary fuse to reduce arc energies, care must be taken to ensure that the replacement fuse does not compromise any of the other factors that affect transformer primary fuse selection. These factors include system considerations, transformer characteristics, NEC requirements and fuse characteristics.

Mersen's 9F60HMH fuse series has a more 'inverse' time current characteristic than traditional E rated fuses and may help reduce arc flash on transformers rated between 500-1500kVA. For more detailed information on Reducing Arc Flash Energies on Transformer Secondaries please refer to Arc Flash Note 6, Issue 1 or contact Mersen Technical Services at TechnicalServices.EP@mersen.com or 978-465-4853.

