

N324. Power Up at Bruce

CANDU units are moving closer to full power operation as solutions to the problem of shifting fuel bundles are implemented. As the CANDU reactors aged, their fuel channels lengthened slightly due to neutron damage. In the case of a header break, fresh fuel could be shifted back towards the center of the core, possibly causing a power pulse. The reactors have been operating at lower power since 1993.

New specially designed and longer shield plugs have been installed at Bruce 1, 2, and 3. Apart from reducing radiation fields, they will allow operation to increase from 60% to 70% power. At Bruce 4, a new solution called "fueling with flow" would change the direction of fueling so that new fuel bundles are installed from the upstream end rather than from downstream. With this type of loading, fuel would not be pushed towards the core in the event of a header break since it would be supported by the new extended shield plugs. This solution takes more time but would allow operation at up to 92% power. This is a very good example of a project with a well thought out solution that will not only reduce dose rates but also increases productivity and enhances safety.

For more, "Power Up at Bruce," Nuclear Engineering International, p. 7, June 1994.