

NPRE 457: HW 39

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December 11, 2024

In the Windscale accident, the Wigner energy caused a large amount of energy to be stored in the graphite at lower power. Once the temperature of the reactor increased, the Wigner energy stored in the graphite lattice was released and caused the explosion. The other case was the Cockcroft Follies were how the filters in the stack were described. Cockcroft advocated for these filters, which stopped radioactive release into the environment – they were follies because others objected.

The graphite sodium cooled reactor used a different coolant and moderator from traditional LWRs. The coolant used was liquid sodium, which could locally boil and cause a positive reactivity addition. The graphite acts as the moderator, which decouples the moderator and coolant – this allows the positive reactivity addition.

An impeller pump uses physical machines to move the flow through pressure differentials. However, electromagnetic pumps move the fluid through electromagnetic forces because the fluids are liquid metals.