

**Table S-3. NE Roadmap Gap Analysis Needs that Cannot be Met with Operating Facilities**

Now	Near Term	Longer Term
Neutron Beam Research Vulnerability (transient) testing	Improvements in the reliability of the medical isotope supply Tritium Production Transuranic Production for National Security needs Proton radiography High energy neutron radiography Non-defense related transient test capability Materials irradiation (14MeV neutrons for fusion materials testing)	Greater Capacity for Medical Isotope Production Nonproliferation Materials Dispositioning Other Waste Materials Dispositioning Additional facilities for Boron Neutron Capture and other medical therapies Long Term Fast Flux Material and Fuel Irradiations

**Table S-4. Reactor Facilities End-of-Life**

<b>Reactor Facility</b>	<b>End-of-Life Estimate</b>	<b>Explanation</b>
High Flux Isotope Reactor (HFIR) ORNL	2035	Pressure vessel is most critical component. Life based on vessel embrittlement design factor
Fast Flux Test Facility (FFTF) PNNL	2026	22-years life based on 400 MW @ 75% capability per evaluation to ASME standards Earliest operational date January 2004 Operation at lower power levels will extend life
Annular Core Research Reactor (ACRR) SNL	2030	Being converted for Isotope Mo99 production Within 2-4 years will need fuel replacement to preserve pulse mode capability Currently not configured for pulse mode
High Flux Beam Reactor (HFBR) Brookhaven (BNL)	2010	At least 10-years of useful life, based on neutron beam tubes operating life in highest flux. Life based on ductility of aluminum which high flux will turn into silicon over time Currently, reactor shutdown due to reactor environmental leaks and estimated restart 2000
Transient Reactor Test Facility (TREAT) Argonne (ANL) West	Beyond 2035	Facility updated late 1980s. Currently, fuels used less than 10% of life. If necessary more fuel can be added Core interiors have seen little neutron exposure. Graphite and components have undetermined life due to reactor operation
Zero Power Physics Reactor (ZPPR) Argonne (ANL) West	Beyond 2035	Components have low exposure Low fuel used due to low power operation Components easily replaced Life may be limited by condition of building, but undetermined
Advanced Test Reactor (ATR) INEEL	Beyond 2035	Next Beryllium (reflector core) replacement 2003. Plans to replace Beryllium again 2013 Replaced cooling tower (has 70-year life) Reactor vessel (stainless steel) life undetermined (beyond 2035)
Power Burst Facility (PBF) INEEL	Currently at End-of-Life	Currently in shutdown mode. Lack of mission requirement Requires complete safety evaluation for start up and requires control hardware modernization