Table 26 · Safety, Sustainability, and Proliferation Risks of Non-Light-Water Reactor Designs Compared to Light Water Reactors

Non-Light-Water Reactor Types	Safety	Sustainability		Nuclear Proliferation/ Terrorism
		Long-Lived Waste Generation	Resource Efficiency	
Sodium-Cooled Fast Reactors				
Conventional burner or breeder (Plutonium/TRU, with reprocessing)	– – –	++	+	– – –
Conventional: Natrium (HALEU, once-through)	– – –	– –	– –	– –
Breed-and-burn mode (HALEU, once-through)	– – –	– –	++	+
High-Temperature Gas–Cooled Reactors				
Prismatic-block (HALEU, once-through)	N	–	–	–
Pebble-bed: Xe-100 (HALEU, once-through)	N	–	–	– –
Molten Salt–Fueled Reactors				
Thermal: IMSR/TAP (LEU <5% U-235)	– – –	+	–	–
Thermal: Thorcon (HALEU/Thorium/U-233)	– – –	–	+	– –
Thermal: Molten Salt Breeder (HALEU/Thorium/U-233)	– – –	++	++	– – –
Molten Salt Fast Reactor (TRU/Thorium/U-233)	– – –	+++	++	– – –

Source: Union of Concerned Scientists, 2021[1683]

– – – Significantly Worse – – Moderately Worse – Slightly Worse

+++ Significantly Better ++ Moderately Better + Slightly Better N Insufficient Information

TRU: Transuranic; **HALEU**: High-assay low enriched uranium; **LEU**: Low-enriched uranium; **IMSR/TAP**: Integral Molten Salt Reactor/Transatomic Power Corporation.

1685 - UCS, "NRC Decision Leaves U.S. Nuclear Plants Vulnerable to Terrorist Drones", Union of Concerned Scientists, 4 November 2019, see https://www.ucsusa.org/about/news/nrc-decision-leaves-nuclear-plants-vulnerable-terrorist-drones, accessed 21 July 2023.