

# Evaluating Nuclear Forensic Signatures for Advanced Reactor Deployment: A Research Priority Assessment

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**Table S1:** Exemplary advanced reactor designs along with the intended form and enrichment of their fuel for the determination of the material attractiveness (MA) sub-score.

| Reactor Type  | Reactor         | Design Org. (Country)                    | Fuel Form                              | Enrichment   | Ref.                 | MA Sub-Score |
|---------------|-----------------|--|--|--|----------------------|--------------|
| GFR           | EM2             | General Atomics (US)                     | UC                                     | 7.7% <sup>235</sup> U (avg.),<br>15% <sup>235</sup> U (max)                                    | ARIS [1]             | 2            |
|               | ALLEGRO         | EURATOM (Europe)                         | (1) MOX or UO <sub>2</sub><br>(2) UPuC | (1) MOX (~4.5% <sup>235</sup> U,<br>~5% <sup>239</sup> Pu) or ~25% Pu<br>(2) 29–35% Pu         | GIF presentation [2] |              |
| LMR           | BREST-300 (LFR) | RDIPE (Russia)                           | PuN-UN                                 | 13.5% Pu   | ARIS [1]             | 1            |
|               | W-LFR           | Westinghouse (US)                        | (1) UO <sub>2</sub> or MOX<br>(2) UN   | 19.75–20% <sup>235</sup> U   | ARIS [1]             |              |
|               | PRISM           | GE-Hitachi (US)                          | U-Pu-Zr                                | 26 % Pu  | ARIS [1]             |              |
| MSR           | MCFR            | TerraPower (US)                          | U, Pu, Th LiF                          | 12% <sup>235</sup> U → natural U   | [3,4]                | 1            |
|               | ThorCon         | ThorCon (US/Indonesia)                   | UF <sub>4</sub> , ThF <sub>4</sub>     | 5% <sup>235</sup> U+ <sup>233</sup> U (avg), 19.7%<br><sup>235</sup> U+ <sup>233</sup> U (max) | ARIS [1]             |              |
| SWCR          | HP-LWR          | Karlsruhe Institute of Technology        | UO <sub>2</sub>                        | 8–9% <sup>235</sup> U  | ARIS [1]             | 1            |
|               | CSR1000         | Nuclear Power Institute of China (China) | UO <sub>2</sub>                        | 6.2% <sup>235</sup> U  | ARIS [1]             |              |
| VHTR/GCR/HTGR | HTR-PM          | Tsinghua University (China)              | TRISO-UO <sub>2</sub>                  | 8.5% <sup>235</sup> U  | ARIS [1]             | 1            |
|               | SC-HTGR         | Framatome (US)                           | TRISO-UO <sub>2</sub>                  | 14.5% <sup>235</sup> U (avg.)  | ARIS [1]             |              |
| FHR           | Mk1 PB-FHR      | UC Berkeley (US)                         | TRISO-UCO                              | 19.8% <sup>235</sup> U   | ARIS [1]             | 1            |
|               | Sm-AHTR         | ORNL (US)                                | TRISO-UCO                              | 8% <sup>235</sup> U  | ARIS [1]             |              |

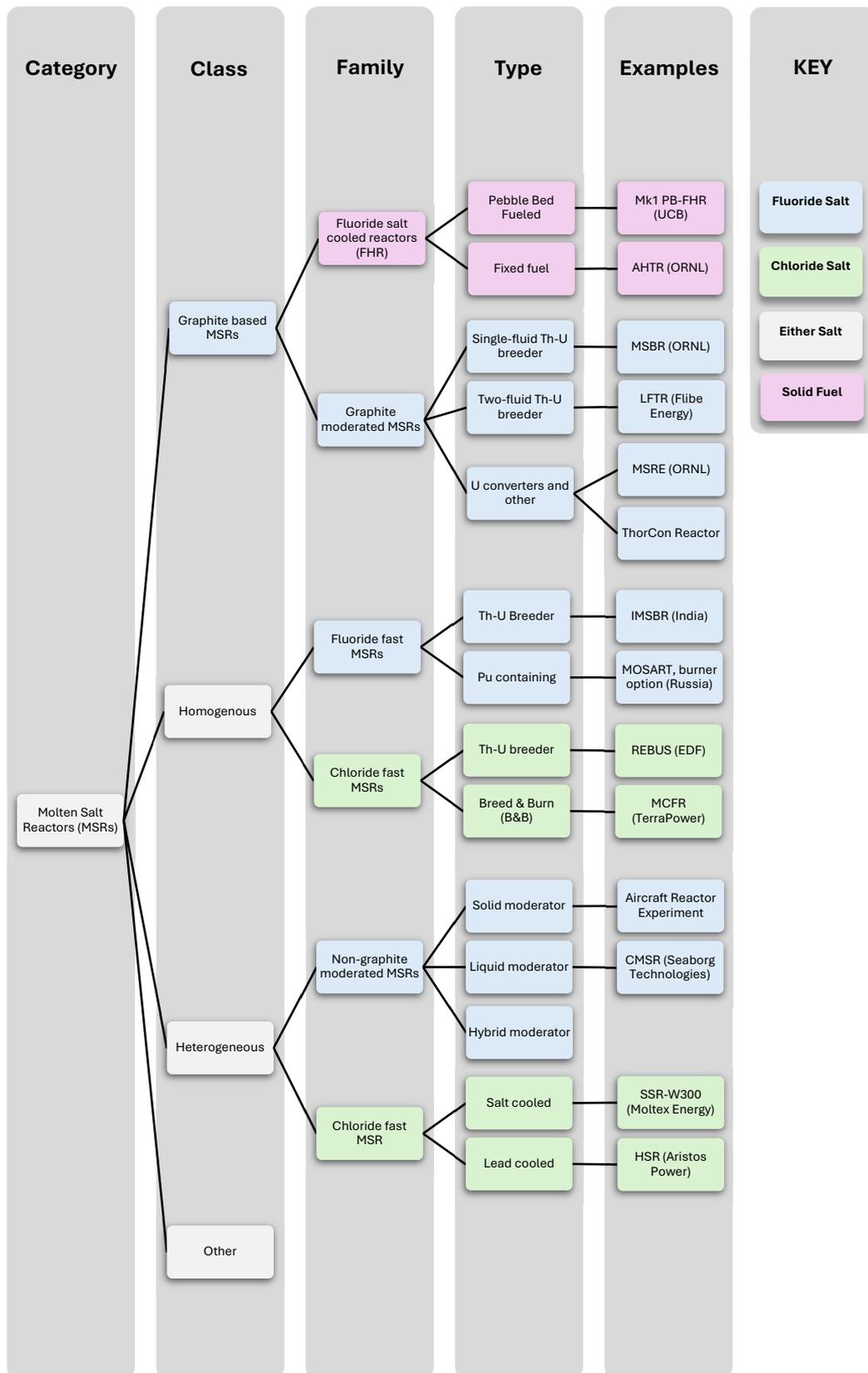


Figure S1: Molten salt reactor class hierarchy based on IAEA report on the status of molten salt reactors [5].

## References

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