

International Atomic Energy Agency



Generic Data Available in USA for Research Reactor and Other Data Sources

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Presentation Outline

- Data sources
- Generic data available
- Data availability
- Additional References
- Recent IAEA Paper

Data Sources in USA

- Licensee annual operating reports
- NRC Operations Center notifications
- RES Report, “Survey of Non-Power Reactors” (NRC, 2000) (Accession # ML003706367)

Other Data Sources for Research Reactors

IAEA-TECDOC-930 applies best to potential U.S. RTR PSA models whereas IAEA-TECDOC-478 and IEEE-STD-500 cite industry data from both nuclear and non-nuclear applications

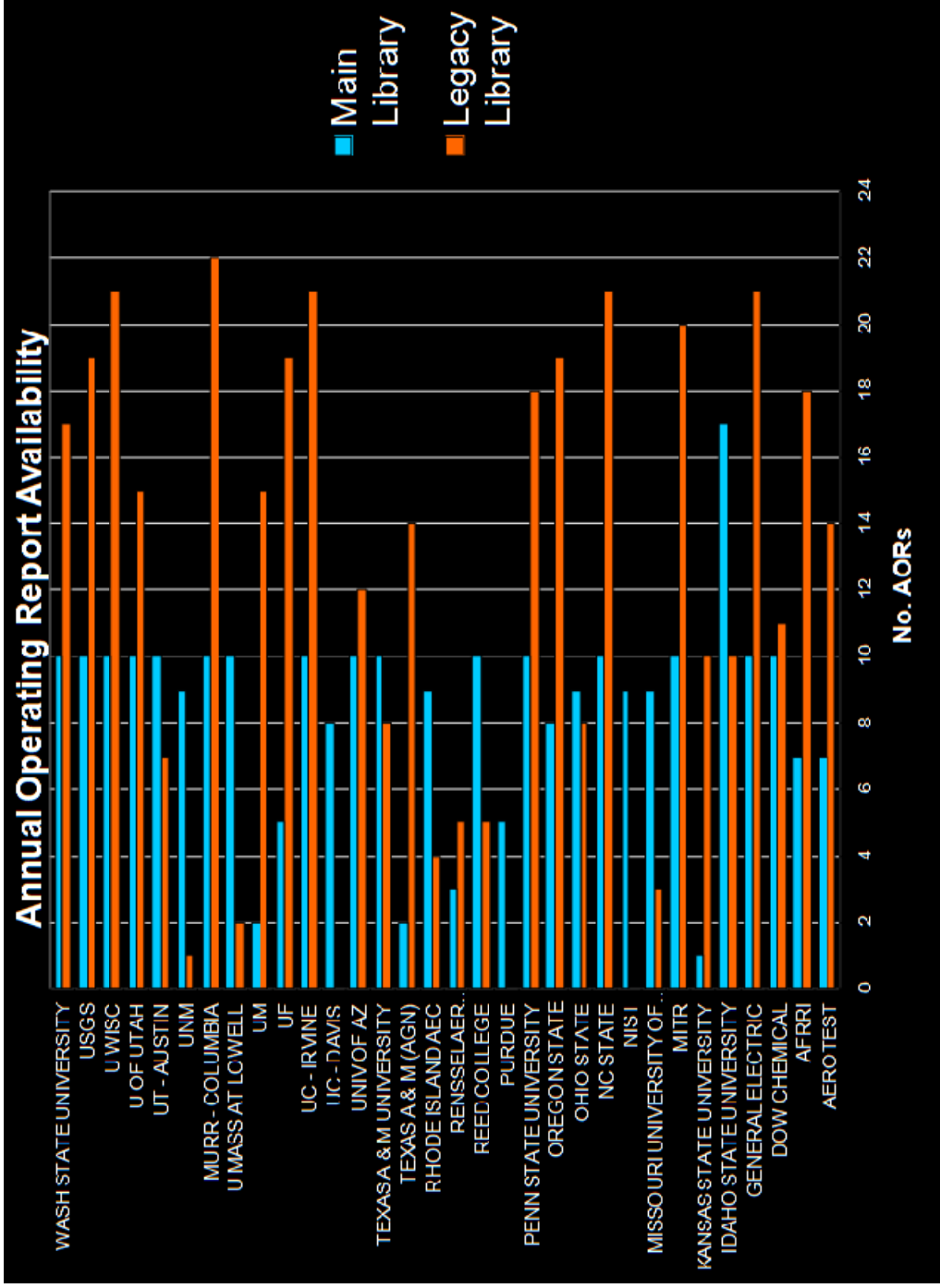
Reliability data sources cited in PSA studies:

Doc. No.	Doc. Title	Additional Info.
IAEA-TECDOC-478 (1988)	IAEA-TECDOC-478 (1988)	<ul style="list-style-type: none"> ➤ ~1000 records ➤ 21 sources
IAEA-TECDOC-930 (1997)	Generic Component Reliability Data for Research Reactor PSA	<ul style="list-style-type: none"> ➤ 13 International facilities ➤ 2-28 years
IEEE-STD-500 (1984)	IEEE Standard Reliability Data for Pumps and Drivers, Valve Actuators, and Valves	<ul style="list-style-type: none"> ➤ Solicitation to industry experts for data figures ➤ Nuclear & non-nuclear

Generic Data Available

TECDOC-930 Code	Events Description	Failures	Freq.
OCR	Failure of control rod/blade or control rod/blade follower	16	8.6
ORA	Failure of CRDM or system or transient rod system	89	18.6
PMA	Failure of primary pump	109	60.2
HXA	Loss of heat sink	1	2.3
GB	Failure of beam tubes or other penetrations	7	110.3
XLT	Failure of fuel element - TRIGA	5	0.3
XAM	Failure of fuel element - Plate-Type Fuel	11	13.2

Data Availability



Additional References

- IAEA-TECDOC, “Manual on Reliability Data Collection for Research Reactor PSAs,” 1992.
- Faghihi, et. al., “Level 1 PSA of the IHWR using SAPHIRE Software,” Reliability Engineering and Safety System, Elsevier, October 2007.
- Bulent Alpay, et. al., “Level 1 PSA Application of TR-2,” Nuclear-39[1].
- Australian Nuclear Science and Technology Organisation, “Replacement Research Reactor Project: PSA Summary for Public Release,” March 2005

Recent IAEA Paper

- M. Nematollahi and Sh. Kamyap, “Evaluating the Core Damage Frequency of a TRIGA Research Reactor Using Risk Assessment Tool Software,” International Conference of Engineers and Computer Scientists, IMECS 2010, March 2010, Hong Kong.
- **Results**
 - Table I ~ Basic Event Failure Probability
 - Table II ~ Initiating Event Frequency
 - Table III ~ CCF Probability



U.S. NRC

United States Nuclear Regulatory Commission

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The End

Questions & Answers.....