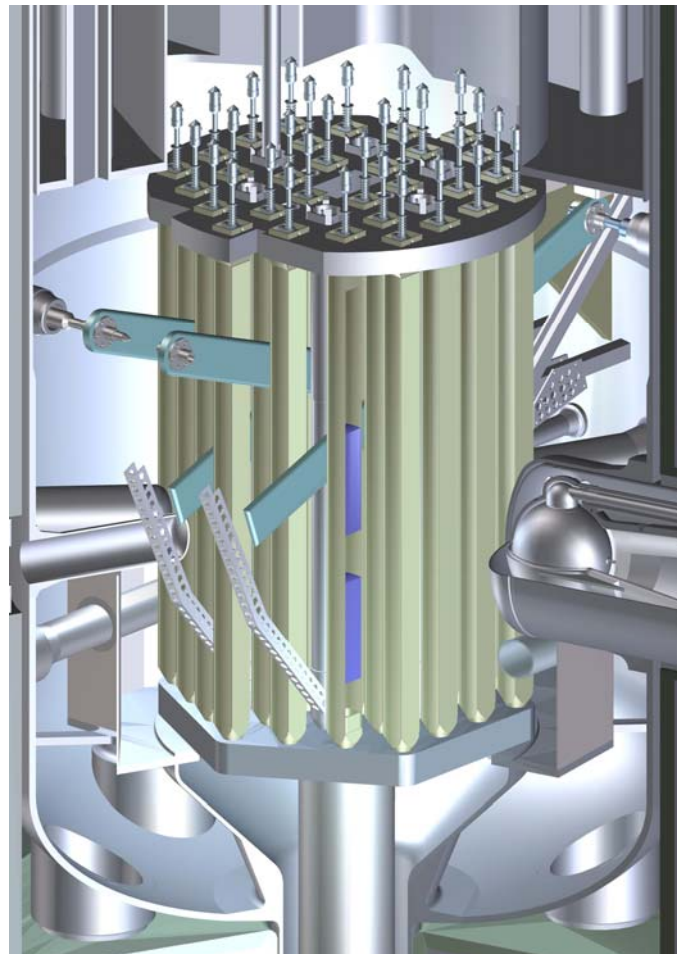


Safety Analysis Report (SAR) for License Renewal for the National Institute of Standards and Technology Reactor – NBSR

NBSR 14



NIST

National Institute of Standards and Technology
Technology Administration, U.S. Department of Commerce

On the cover: A 3-D representation of the NBSR reactor core and internals.
Graphic Image by Paul Kopetka

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April 2004



U.S. DEPARTMENT OF COMMERCE

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NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

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ACRONYMS

AC	air conditioning
ALARA	as low as reasonably achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ASME	American Society of Mechanical Engineers
ATWS	anticipated transients without scram
BNL	Brookhaven National Laboratory
BOC	beginning of cycle (fuel)
BOCA	Building Officials & Code Administrators
CDE	committed dose equivalent
CEDE	committed effective dose equivalent
CFR	U.S. Code of Federal Regulations
CHF	critical heat flux
CHFR	critical heat flux ratio
CR	control room
DAC	derived air concentration
DBA	design basis accident
DNB	departure from nuclear boiling
EOC	end of cycle (fuel)
EOF	emergency offsite facility
EOP	emergency operating procedure
EPA	Environmental Protection Agency
EPG	emergency procedure guideline
EPZ	emergency planning zone
ESF	engineered safety feature
GDC	General Design Criteria
HEPA	high efficiency particulate absorber
HEU	high enriched uranium
HVAC	heating, ventilation, and air conditioning
I&C	instrumentation and control
IAEA	International Atomic Energy Agency
IEEE	Institute of Electrical and Electronics Engineers
LCO	limiting condition operation
LER	licensee event report
LEU	low enriched uranium
LOCA	loss-of-coolant accident
LSSS	limiting safety system setting
MCC	motor control center
MCHFR	Minimum Critical Heat Flux Ratio
MCNP	Monte Carlo Neutron Photon (computer code)
MCR	main control room
MHA	maximum hypothetical accident
NCNR	NIST Center for Neutron Research
NEMA	National Electrical Manufacturer's Association
NIST	National Institute of Standards & Technology
NPP	nuclear power plant

NRC	Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation (NRC)
NBSR	National Bureau of Standards Reactor
OL	operating license
PIC	pocket ion chamber
PRA	probabilistic risk assessment
RCS	reactor coolant system
REM	Roentgen Equivalent Man
RG	regulatory guide (NRC)
SAC	Safety Audit Committee
SAR	safety analysis report
SEC	Safety Evaluation Committee
SGTR	steam generator tube rupture
SL	safety limit
SRP	Standard Review Plan
SSC	structure, system, and component
SU	startup
SUNY	State University of New York
TLD	Thermo-Luminescent Dosimeters
TS	technical specification
UL	Underwriters Laboratory
V&V	verification and validation

PREFACE

This Safety Analysis Report (SAR) of the National Institute of Standards and Technology Reactor, NBSR, describes the facility and contains all of the latest modifications made to it as of January 1, 2004. This report is being submitted to the US Nuclear Regulatory Commission (NRC) in support of the License Renewal Application for the NBSR. This SAR is given NIST document number NBSR 14 and is a complete revision to the previous Final Safety Analysis Report on the National Bureau of Standards Reactor that was submitted to NRC as document NBSR 9.

Dennis Brady of the NCNR contributed substantially to writing this SAR. He also directed the Brookhaven National Laboratory effort to coordinate, edit and act as technical reviewer for the report. He managed the contract with URS Corporation for the seismology, geology and hydrology analysis and the contract with EnviroTech Sensors Inc. for the meteorology analysis. Special thanks are given to Dr. J. Michael Rowe, Director of NCNR, who supervised the preparation of the report and contributed substantially in the area of accident analysis. Mike is retiring after directing the NCNR for the past 15 years.

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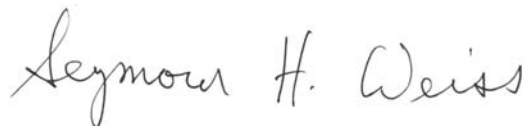
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