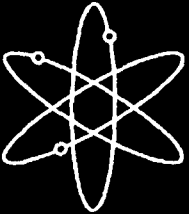


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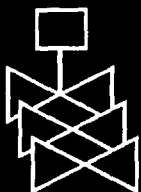
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ABSTRACT

This safety evaluation report (SER) documents the technical review of the Monticello Nuclear Generating Plant (MNGP) license renewal application (LRA) by the staff of the U.S. Nuclear Regulatory Commission (NRC or the staff). By letter dated March 16, 2005, Nuclear Management Company, LLC (NMC or the applicant), submitted the LRA for MNGP in accordance with Title 10, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," of the *Code of Federal Regulations* (10 CFR Part 54). NMC is requesting renewal of the operating license for MNGP (Facility Operating License Number DPR-22) for a period of 20 years beyond the current expiration date of midnight September 8, 2010.

MNGP is located approximately 30 miles northwest of Minneapolis, Minnesota. The NRC issued the construction permit for MNGP on June 19, 1967. The NRC issued the operating license for MNGP on January 9, 1981. MNGP is a single-cycle, forced circulation, General Electric BWR-3, a boiling-water reactor producing steam for direct use in a steam turbine. General Electric Corporation supplied the nuclear steam supply system and Bechtel Corporation originally designed and constructed the balance of the plant. MNGP operates at a licensed power output of 1775 megawatt thermal (MWt), with a gross electrical output of approximately 600 megawatt electric (MWe).

The staff reviewed the MNGP LRA in accordance with Commission regulations and NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants," dated July 2001. Section 6 of this SER provides the staff's conclusion of its review of the MNGP LRA.

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ABBREVIATIONS

AC	alternating current
ACI	American Concrete Institute
ACRS	Advisory Committee on Reactor Safeguards
ADAMS	Agencywide Document Access and Management System
ADS	automatic depressurization system
AERM	aging effect requiring management
AFW	auxiliary feedwater
AIR	instrument and service air
AMAs	aging management activities
AMG	aging management guideline
AMP	aging management program
AMR	aging management review
AN2	alternate nitrogen system
ANSI	American National Standards Institute
APR	automatic pressure relief
APRM	average power range monitor
AR	action request
ARM	area radiation monitor
ART	adjusted reference temperature
ASA	American Standards Association
ASD	alternate shutdown
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATWS	anticipated transient without scram
AWI	administrative work instruction
B&W	Babcock and Wilcox
BWR	boiling-water reactor
BWROG	Boiling Water Reactor Owners Group
BWRVIP	Boiling Water Reactor Vessel and Internals Project
CAP	Corrective Action Program
CASS	cast austenitic stainless steel
CB&I	Chicago Bridge & Iron
CCCW	closed-cycle cooling water
CCW	closed cooling water or component cooling water
CDR	main condenser
CE	<i>Combustion Engineering</i>
CFR	<i>Code of Federal Regulations</i>
CFW	condensate and feedwater
CGC	combustible gas control
CI	confirmatory item
CLB	current licensing basis
CMAA	Crahe Manufacturers Association of America
CR	condition report

CRD	control rod drive
CRDA	control rod drop accident
CRDM	control rod drive mechanism
CRGT	control rod guide tube
CS	containment spray
CSP	core spray
CST	condensate storage tank
CUF	cumulative usage factor
CVCS	chemical and volume control system
CW	circulating water
DBA	design-basis accident
DBD	design-basis document
DBE	design-basis event
DC	direct current
DG	diesel generator
DGN	EDG system
DOE	Department of Energy
DOL	diesel oil
DWS	demineralized water system
ECCS	emergency core cooling system
ECP	electrochemical potential
EDG	emergency diesel generator
EFB	emergency filtration train building
EFPY	effective full-power years
EFT	emergency filtration train
EMA	equivalent margin analysis
EOCI	Electric Overhead Crane Institute
EOL	end of license
EPRI	Electric Power Research Institute
EQ	environmental qualification
ESF	engineered safety feature
ESW	emergency service water
FAC	flow-accelerated corrosion
FERC	Federal Energy Commission, U.S.
F_{en}	environmental fatigue factor
FHA	fire hazards analysis
FIR	fire system
FP	fire protection
FPC	fuel pool cooling and cleanup
FR	<i>Federal Register</i>
ft-lb	foot-pound
FPP	fire protection plan
FSAR	final safety analysis report
FSD	functional system description
FW	feedwater

GALL	generic aging lessons learned
GE	General Electric
GEIS	Generic Environmental Impact Statement
GL	generic letter
GSI	generic safety issue
HCU	hydraulic accumulator
HELB	high-energy line break
HP	horsepower
HE/ME	high energy/moderate energy
HEPA	high efficiency particulate filter
HGR	hangers and supports
HJTC	heated junction thermocouple
HPB	HPCI building
HPC	high pressure coolant injection
HPCI	high-pressure coolant injection
HTV	heating and ventilation
HVAC	heating, ventilation, and air conditioning
HWC	hydrogen water chemistry
I&C	instrumentation and controls
IASCC	irradiation assisted stress-corrosion cracking
ID	inside diameter
IEB	Inspection and Enforcement Bulletin
IEEE	Institute of Electrical and Electronics Engineers
IF	intended function
IGA	intergranular attack
IGSCC	intergranular stress-corrosion cracking
IN	information notice
INPO	Institute of Nuclear Power Operations
IPA	integrated plant assessment
IR	insulation resistance
IRM	intermediate range monitor
ISA	Instrument Society of America
ISG	interim staff guidance
ISI	inservice inspection
ISP	Integrated Surveillance Program
IWB	requirements for Class 1 components of light-water cooled power plants
IWC	requirements for Class 2 components of light-water cooled power plants
IWD	requirements for Class 3 components of light-water cooled power plants
IWE	requirements for Class MC and metallic liners of Class CC components of light-water cooled power plants
IWF	requirements for Class 1, 2, 3, and MC component supports of light-water cooled power plants
IWL	requirements for Class CC concrete components of light-water cooled power plants
ksi	one KIP per square inch, 1000 psi
ksi-in ^{1/2}	kilopound per square inch times square root of inches

kV	1000 volts or 1 kilovolt
lb/ft ²	pound(s) per square foot
LIS	Licensing Information Service
LLC	limited liability company
LO	lubricating oil
LLRT	local leak-rate test
LOCA	loss-of-coolant accident
LOOP	loss of offsite power
LP	low pressure
LPCI	low-pressure coolant injection
LPRM	local power range monitor
LR	license renewal
LRA	license renewal application
MCC	motor control center
MCR	main control room
MEAP	material, environment, aging effects, and aging management program
MeV	million electron volts
MIC	microbiologically influenced corrosion
MNGP	Monticello Nuclear Generating Plant
MOD	motor-operated disconnect
MR	maintenance rule
MSIV	main steam isolation valve
MST	main steam
MTEB	NOT DEFINED
MUD	makeup demineralizer
MVP	mechanical vacuum pump
MW	megawatts
MWe	megawatt electric
MWh	megawatt hour
MWt	megawatt thermal
n/cm ²	neutrons per square centimeter
NDE	nondestructive examination
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act of 1969
NFPA	National Fire Protection Association
NMC	Nuclear Management Company, LLC
NMS	neutron monitoring system
NPS	nominal pipe size
NRC	U.S. Nuclear Regulatory Commission
NSR	nonsafety-related
NSSS	nuclear steam supply system
NUMARC	Nuclear Utility Management and Resource Council
NUREG	designation of publication prepared by NRC staff
OBE	operating-basis earthquake

OCCW open-cycle cooling water program
 ODSCC outside-diameter stress-corrosion cracking
 OE operating experience
 OGB off gas storage and compressor building
 OGS off gas stack
 OI open item

P&ID piping and instrumentation diagram
 PA public address system
 PAB plant administration building
 PASS post-accident sampling system
 PBD program-basis document
 PBX private branch exchange
 PCIS primary containment isolation system
 PCM primary containment mechanical
 PCS process computer system
 PCT primary containment
 pH concentration of hydrogen ions
 PM preventive maintenance
 ppb parts per billion
 ppm parts per million
 PPS plant protection system
 PRM process radiation monitor
 psi pounds per square inch
 psig pounds per square inch gauge
 P-T pressure temperature
 PT penetrant testing
 PVC polyvinyl chloride (plastic)
 PWR pressurized-water reactor
 PWSCC primary water stress-corrosion cracking

QA quality assurance
 QC quality control
 Q-List quality list

RAD radwaste solid and liquid
 RAI request for additional information
 RBC reactor building closed cooling water
 RBM rod block monitor
 RCI reactor core isolation cooling
 RCIC reactor core isolation cooling
 RCP reactor coolant pump
 RCPB reactor coolant pressure boundary
 RCS reactor coolant system
 REC reactor recirculation
 RG regulatory guide
 RHR residual heat removal
 RI-ISI risk-informed inservice inspection

RIT	reactor internals
RLC	reactor level control
RPV	reactor pressure vessel
RSW	residual heat removal service water
RT _{NDT}	reference temperature nil ductility transition
RVI	reactor vessel instrumentation
RVID	Reactor Vessel Integrity Database
RWB	radioactive waste building
RWC	reactor water cleanup
SBO	station blackout
SC	structure and component
SCBA	self-contained breathing apparatus
SCC	stress-corrosion cracking
SCT	secondary containment
SE	safety evaluation
SER	safety evaluation report
SFP	spent fuel pool
SI	safety injection
SIL	service information letter
SJAE	steam jet air ejector
SLC	standby liquid control
SMAW	shield metal arc weld
SOER	significant operating event report
SPC	steam and power conversion
SPDS	safety parameter display system
SR	safety-related
SRM	source range monitor
SRP	Standard Review Plan
SRP-LR	Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants
SRV	safety relief valve
SSC	system, structure, or component
SSW	service & seal water
SW	service water
TAC	technical assignment control (internal NRC work management tool)
TAP	torus attached piping
TASCS	thermal stratification, cycling, and striping
TGSCC	transgranular stress-corrosion cracking
TLAA	time-limited aging analysis
TR	topical report
TS	technical specification
TT	thermal transient
UAC	uninterruptible alternating current
µm	micrometer
UDB	underground duct bank
UPS	uninterruptible power supply

USAR	Updated Safety Analysis Report
USAS	United States of America Standards
USE	upper-shelf energy
UT	ultrasonic testing
UV	ultraviolet
VAC	volts-alternating current
VDC	volts-direct current
VT	visual examination
WDW	well and domestic water
WO	work order
XLPE	cross-linked polyethylene