
Safety Evaluation Report

Related to the License Renewal of
McGuire Nuclear Station, Units 1 and 2
Catawba Nuclear Station, Units 1 and 2

Docket Nos. 50-369, 50-370, 50-413, and 50-414

Duke Energy Corporation

U.S. Nuclear Regulatory Commission

Office of Nuclear Reactor Regulation

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ABSTRACT

This safety evaluation report documents the Nuclear Regulatory Commission's (NRC's) review of Duke Energy Corporation's (Duke's) application to renew the operating licenses for McGuire Nuclear Station, Units 1 and 2 (McGuire 1 and 2), and Catawba Nuclear Station, Units 1 and 2 (Catawba 1 and 2). The NRC's Office of Nuclear Reactor Regulation has reviewed the McGuire 1 and 2 and Catawba 1 and 2 license renewal application for compliance with the requirements of Title 10 of the *Code of Federal Regulations*, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants," and prepared this report to document its findings.

On June 13, 2001, Duke submitted applications for renewal of McGuire 1 and 2 Operating License Nos. NPF-9 and NPF-17, which were issued pursuant to Section 103 of the Atomic Energy Act of 1954, as amended, for a period of up to 20 years beyond the current license expiration dates of June 12, 2021, and March 3, 2023, for McGuire 1 and 2, respectively. The McGuire nuclear facility is located 17 miles north-northwest of Charlotte, North Carolina, in Mecklenburg County. McGuire 1 and 2 are four-loop, Westinghouse pressurized-water reactors with nuclear steam supply systems designed to generate 3411 megawatts thermal, or 1129 megawatts electric.

In the same submittal of June 13, 2001, Duke requested renewal of the Catawba 1 and 2 Operating License Nos. NPF-35 and NPF-52, which were issued under Section 103 of the Atomic Energy Act of 1954, as amended, for a period of up to 19 years beyond the current license expiration dates of December 6, 2024, and February 24, 2026, respectively. The Catawba nuclear facility is located 18 miles southwest of Charlotte, North Carolina, in York County. Catawba 1 and 2 are four-loop, Westinghouse pressurized-water reactors with nuclear steam supply systems designed to generate 3411 megawatts thermal, or 1129 megawatts electric.

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ABBREVIATIONS

ACI	American Concrete Institute
ACRS	Advisory Committee on Reactor Safeguards
ACSR	aluminum conductor steel reinforced
AFW	auxiliary feedwater (system)
AMP	aging management program
AMR	aging management review
ANSI	American National Standards Institute
AS	auxiliary steam (system)
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
BMI	bottom-mounted instrumentation
BTP	Branch Technical Position
BWI	Babcock and Wilcox International
CASS	cast austenitic stainless steel
CCW	condenser circulating water (system)
CFR	Code of Federal Regulations
CIV	containment isolation valve
CLB	current licensing basis
CRDM	control rod drive mechanism
CSS	containment spray system
CUF	cumulative usage factor
CVCS	chemical and volume control system
DBA	design basis accident
DBD	design basis document
ECCS	emergency core cooling systems
ECT	eddy current test
EFPY	effective full-power years
ELL	Electrical Licensing Library
EOC	end of cycle
EOLE	end of life extended
EPDM	ethylene propylene diene monomer
EPL	vital batteries system
EPQ	diesel generator batteries system
EPRI	Electric Power Research Institute
EQ	environmental qualification
EQD	standby shutdown facility diesel batteries system
ETM	standby shutdown facility batteries system
FAC	flow-accelerated corrosion
FD	(system) flow diagram
FI	filtration
FP	fire protection
FSAR	final safety analysis report
GALL	Generic Aging Lessons Learned (Report)
GDC	general design criterion or general design criteria
GEIS	generic environmental impact statement
gpm	gallons per minute
GSI	generic safety issue

HAZ	heat-affected zone
HELB	high-energy line break
HVAC	heating, ventilation, and air conditioning
HT	heat transfer
I&C	instrumentation and controls
IASCC	irradiation-assisted stress corrosion cracking
ID	inner diameter
IGSCC	intergranular stress corrosion cracking
IPA	integrated plant assessment
IR	insulation resistance
ISG	interim staff guidance
ISI	inservice inspection
ITS	Improved Technical Specifications
LBB	leak-before-break (analysis)
LEFM	linear elastic fracture mechanics
LER	Licensee Event Report
LOCA	loss-of-coolant accident
LRA	license renewal application
LWR	light-water reactor
MeV	million electron volts
MIC	microbiologically induced corrosion
Mpa	mega pascals
MRP	Materials Reliability Project
MW	megawatts
NC	reactor coolant
NDT	nil ductility temperature, non-destructive testing
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NPAR	nuclear plant aging research
NRC	Nuclear Regulatory Commission
NSAC	Nuclear Safety Analysis Center
NSD	Nuclear System Directive
NSSS	nuclear steam supply system
NSW	nuclear service water (system)
NW	containment valve injection water (system)
ODSCC	outside diameter stress corrosion cracking
OSHA	Occupational Safety and Health Administration
P-T	pressure-temperature
P&ID	pipng and instrumentation diagram
PB	pressure boundary
PCB	power circuit breaker
PIP	Problem Investigation Process
PORV	power-operated relief valve
ppb	parts per billion
ppm	parts per million
psig	pounds per square inch gauge
PTS	pressurized thermal shock
PWHT	post-weld heat treated
PWR	pressurized water reactor

PWSCC	primary water stress corrosion cracking
RAI	request for additional information
RCCA	rod cluster control assembly
RCP	reactor coolant pump
RCS	reactor coolant system
RF	interior fire water (system)
RG	regulatory guide
RHR	residual heat removal (system)
RPV	reactor pressure vessel
RTD	resistance temperature detector
RSG	replacement steam generator
RT	reference temperature
RV	reactor vessel
RVI	reactor vessel internals
RVID	Reactor Vessel Integrity Database
RWST	refueling water storage tank
SBO	station blackout (event)
SCC	stress corrosion cracking
SCs	structures and components
SER	safety evaluation report
SFP	spent fuel pool
SG	steam generator
SIS	safety injection system
SLC	Selected Licensee Commitments
SNSW	standby nuclear service water
SNSWP	standby nuclear service water pond
SR	surveillance requirement
SRP	Standard Review Plan
SCC	stress corrosion cracking
SCV	steel containment vessel
SE	safety evaluation
SER	safety evaluation report
SOC	Statement of Considerations
SSs	systems and structures
SSCs	systems, structures, and components
SSE	safe-shutdown earthquake
SSF	standby shutdown facility
SSS	standby shutdown system
TFMP	Thermal Fatigue Management Program
TGSCC	transgranular stress corrosion cracking
TH	throttle
TLAA	time-limited aging analysis
TR	testing requirement
TS	technical specification(s)
TSSR	technical specification surveillance requirement
UFSAR	updated final safety analysis report
UHI	upper head injection
UT	ultrasonic testing
VA	auxiliary building ventilation (system)
VC	control area ventilation (system)

VCP	Vessel Closure Penetration (Nozzle Inspection Program)
VD	diesel building ventilation (system)
VE	annulus ventilation (system)
VF	fuel handling building ventilation (system)
VHP	vessel head penetration
VK	miscellaneous structures ventilation (system)
VT	visual examination
W	Westinghouse
WCAP	Westinghouse topical report
WOG	Westinghouse Owners Group
YC	control area chilled water (system)