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DUKE POWER

June 15, 1995

U. S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SUBJECT: Duke Power Company
Request for Relief from ASME Section III Requirements
Duke Power Request for Relief 95-GO-002

Catawba Nuclear Station
Docket Nos. 50-413, 414

McGuire Nuclear Station
Docket Nos. 50-369, 370

Pursuant to 10 CFR 50.55a(a)(3), Duke Power is hereby requesting relief from requirements of ASME Boiler and Pressure Vessel Code Section III for Catawba and McGuire Nuclear Stations. The requested relief would allow Duke Power to retain the installation of manual block valves located in series with relief valves associated with the Volume Control Tanks and the Regenerative Heat Exchangers. These block valves are part of the original plant design, which is based on the standard Westinghouse design, and licensed for use at Catawba and McGuire. The block valves facilitate maintenance of the affected components and have administrative controls for ensuring they are in the open position in order to maintain overpressure protection during times of plant operation. Duke Power is making this submittal as a result of Westinghouse Nuclear Safety Advisory Letter NSAL-94-009 which identified the code non-compliance issues described in this relief request. Additionally, the appropriateness of submitting this relief request has been documented in NRC Inspection Report 50-413/94-30 and 50-414/94-30 written for Catawba Nuclear Station.

A detailed relief request is contained in the attachment to this letter. Questions on this request may be directed to J. S. Warren at (704) 382-4986.

Very truly yours,

M. S. Tuckman

M. S. Tuckman

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Attachment: Duke Power Request for Relief No. 95-GO-002,
Pages 1 thru 11 and Figures 1 thru 4

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ATTACHMENT

Serial No. 95-GO-002

DUKE POWER COMPANY

REQUEST FOR RELIEF 95-GO-002

Stations: Catawba Nuclear Station
McGuire Nuclear Station

Units: Catawba 1 and 2, McGuire 1 and 2

Requesting Department: Nuclear Generation

Reference Code: ASME Boiler and Pressure Vessel Code, Section III 1974 Edition including Summer 1974 Addenda for Catawba

ASME Boiler and Pressure Vessel Code, Section III 1971 Edition thru Winter 1971 Addenda for McGuire

Request for Relief From ASME Code Section III

Pursuant to 10 CFR 50.55a(a)(3) Duke Power is hereby requesting relief for Catawba and McGuire Nuclear Stations from the requirements of Articles NC-7000 and ND-7000 of the ASME Boiler and Pressure Vessel Code, Section III edition specified in Chapter 3 of the respective FSAR for each nuclear station. This relief will permit Duke to retain the installation of several block valves that are located in series with overpressure protection devices for the Volume Control Tanks and the Regenerative Heat Exchangers on Catawba and McGuire. The placement of these block valves is not in compliance with the referenced portion of the ASME Code based upon current interpretation. Such placement, where necessary and with appropriate administrative controls, was originally found to be acceptable in ASME Code Interpretation III-1-80-67 in accordance with the "controls and interlocks" provision of NC-7142 (as designated at that time). Subsequent ASME Code interpretations III-1-89-25 and III-1-80-67R (revision to the original interpretation), as emphasized to Duke in Westinghouse Nuclear Safety Advisory Letter NSAL-94-009, found such placement to be in non-compliance with the ASME Code. These latter interpretations found the placement of Normally Open/Locked Open valves in the relief path of ASME Code components to be unacceptable. Further, in both of the latter interpretations, the use of administrative controls such as locked valves and/or operating procedures were also found to be inadequate to ensure ASME Code compliance. Duke

maintains these latter interpretations, and the implication that the affected block valves must be removed, present an operational hardship for Catawba and McGuire that is potentially adverse to overall plant safety. Consequently, Duke is pursuing appropriate relief (as subsequently described in detail) from the referenced provisions of the ASME Code in order that these block valves may be retained under the new interpretation of the ASME Code.

Request for Relief 95-GO-002 addresses the issues identified in Westinghouse Nuclear Safety Advisory Letter NSAL-94-009 and further documented in NRC Inspection Reports 50-413/94-30 and 50-414/94-30. The application of the block valves described in the subsequent paragraphs of this relief request is based upon the standard Westinghouse design for the affected systems as originally licensed for Catawba and McGuire, and is also similar to the design of other systems in Duke nuclear plants.

CATAWBA NUCLEAR STATION

REQUEST FOR RELIEF 95-GO-002

I. COMPONENTS FOR WHICH RELIEF IS REQUESTED

Volume Control Tanks (VCT)

The components for which relief is being requested are manual block valves 1NB066 and 1NB084 for Units 1 and 2 at Catawba. These block valves are installed in relief header configurations shared between the two units. The block valves are locked open in the discharge path of relief valves 1NV223 and 2NV223. These relief valves provide overpressure protection for the Unit 1 VCT and the Unit 2 VCT respectively. The relief valves discharge to one of two available recycle holdup tanks (RHT) so that the radioactive gas or liquid released will be contained within a closed system. Additionally, valves 1NB287, 1NB378, and 1NB395 are provided in the relief valve discharges from the Unit 2 VCT and various Unit 2 Emergency Core Cooling System (ECCS) and Containment Spray System (NS) components. The purpose of the block valves is to isolate individual RHTs for personnel safety during maintenance, to allow processing of individual RHT contents without uncontrolled discharges into an RHT, and to allow testing of an individual RHT without incapacitating the entire system or the VCT overpressure protection.

The VCTs are part of the chemical and volume control system (NV) and the RHTs are part of the boron recycle system (NB). The RHTs are shared between the two Catawba units. Figure 1 provides a schematic of the VCT/RHT block/relief valves configuration as shared between the two Catawba units. The VCT and its relief valve discharge header also serve to collect relief valve discharge from numerous ASME Code Section III ECCS and NS components. However, in all cases these components are of higher design pressure than the VCT or discharge header piping, therefore the VCT analysis is considered limiting.

Regenerative Heat Exchanger (RHE)

The components for which relief is being requested are manual block valves 1NV035 and 2NV035 for Catawba Unit 1 and Unit 2 respectively. These block valves are installed in identical configurations on each of the Catawba units. The block valves are in the discharge path of spring-loaded thermal relief check valves 1NV036 and 2NV036 for Catawba Unit 1 and Unit 2 respectively. Each relief valve provides overpressure protection for the RHE on each of the respective Catawba units in the event of NV malfunction.

These components are part of NV. Figure 2 provides a typical schematic of the RHE block/relief valves configuration for each Catawba unit.

II. CODE REQUIREMENTS

The VCTs and the RHEs block valves are constructed to the requirements of 1974 ASME Code Section III. Overpressure protection requirements are stipulated in Section III, Articles NC-7000 and ND-7000 and permit the installation of stop valves or similar devices on the inlet or discharge of relief valves, but the utilization of "positive controls and interlocks" is required. ASME Code Section III Interpretation III-1-80-67R dated March 1, 1989 states "controls and interlocks ... are pressure sensing devices which would activate the stop valve to provide fluid access to the relief valve, thereby assuring the pressure relieving function is met at all times". However, Interpretations III-1-80-67R as well as III-1-89-25 further rule that administrative controls such as operating procedures governing the use and application of the system (such as normally open or locked open valves in the relief path) may not be construed as "positive controls".

Even though interpretation III-1-80-67R is strictly applicable to later versions of ASME Code Section III, it may be conservatively applied to the 1974 Edition of ASME Code Section III (including Summer 1974 Addenda) which is applicable to the Catawba design. Consequently, the location of a manual block valve in series with a pressure relieving device without the proper "controls and interlocks" does not conform with the intent of the ASME Code Section III requirements as currently interpreted.

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

Duke Power is requesting relief from the "controls and interlocks" requirements of 1974 ASME Code Section III which states the following:

"NC-7153 (as designated in the 1974 Code Edition With Summer 1974 Addenda) - No stop valve or other device shall be placed relative to a pressure-relief device so that it could reduce the overpressure protection below that required by these rules, unless such stop valves are constructed and installed with positive controls and interlocks so that the relieving capacity requirements of NC-7400 are met under all conditions of operation of the system and the stop valves. Means shall be provided such that the cperability of controls and interlocks can be verified by test."

IV. PROPOSED ALTERNATIVE TO CODE REQUIREMENTS

As an alternate to ASME Code Section III requirements, Duke Power is proposing to maintain proper configuration of the affected components by means of the following administrative controls:

Volume Control Tank

Manual block valves 1NB066 and 1NB084 are physically locked open. Where block valves are used in applications such as these, the valves are clearly identified as LO-01 Code. This code is further defined in station documents as, "Valve locked to prevent isolation of overpressure protection". Closure of these identified valves requires that a "Red Tag" be hung and a "Removal and Restoration" process be adhered to. These processes require that an evaluation be performed any time that a valve, which is locked open for overpressure protection

flow path purposes, must be closed. Additionally, all locked valves are verified in the correct position on a periodic basis of one year or less. Valves associated with certain safety related components or functions are verified along with that component or function. Operations Procedure OP/0/A/6200/03, "Boron Recycle System", specifies that isolation valves 1NB066 and 1NB084 are to be locked open. This ensures that the discharge header has a continuous flow path to the RHTs A or B. Additionally, valves not included in any associated Technical Specifications surveillance requirement are included in PT/1(2)/B/4700/41, "Locked Valves Annual Verification Inside Unit 1 (2) Containment", or PT/0/B/4700/40, "Locked and Administratively Controlled Valve Annual Verification Outside Containment", which were written to verify locked valve positions not already verified by some other procedure.

Regenerative Heat Exchanger

Manual block valves 1NV035 and 2NV035 are physically locked-open. Where block valves are used in applications such as these, the valves are clearly identified as LO-01 Code (see additional information on the LO-01 Code designation in the preceding paragraph). Valves not included in any associated Technical Specifications surveillance requirement are included in PT/1(2)/B/4700/41, "Locked Valves Annual Verification Inside Unit 1 (2) Containment", or PT/0/B/4700/40, "Locked and Administratively Controlled Valve Annual Verification Outside Containment" which were written to verify locked valve positions not already verified by some other procedure.

V. BASIS FOR RELIEF

1. Administrative controls in the form of Operating Procedures and walkdowns supplemented by physical locks and chains serve to ensure the block valves associated with the VCT and RHE remain open. Therefore, it is not anticipated that the overpressure function would be unavailable in the unlikely event that a relief valve does lift.

2. Duke Power maintains compliance with the referenced ASME Code requirements would result in hardships or unusual difficulties without a compensating increase in the level of quality and safety. These block valves help

ensure personnel safety and provide the operational flexibility to perform maintenance activities on the affected components. Further, the subject relief valves/block valves arrangement in each of the two applications described above are consistent with the Westinghouse standard design and were included in the original design for the affected Catawba systems. These applications were extensively reviewed and documented throughout the licensing process for Catawba Nuclear Station.

3. The as-built configuration of the relief valves/block valves used at Catawba provides an acceptable level of quality and safety. Misposition (closure) of the block valves, although not desirable, would not render the ECCS inoperable nor adversely affect the ability to safely shutdown the plant.

The following failure consequences of each of the block valves applications at Catawba have been evaluated to show there are no adverse safety consequences as detailed in the subsequent paragraphs.

Volume Control Tank - Failure Consequences

Duke Power Company Calculation CNC-1227.00-00-0064 was performed to determine the dose consequences of a postulated VCT rupture. This analysis is applicable to both Catawba and McGuire Nuclear Stations. Assumptions and inputs are as listed below:

1. A VCT rupture occurs with the VCT volume at the high level alarm setpoint.

2. Iodine concentration in the Reactor Coolant System is at the maximum limit allowed by Technical Specifications.

3. Additional flow occurs from the letdown piping, with both the 75 gpm and 45 gpm orifices in service until there is operator response to isolate letdown (assumed 60 minutes).

4. No flashing of letdown flow occurs, but partitioning of iodine to the atmosphere is accounted for.

5. The whole body dose calculation is based on the maximum gross gamma activity allowed by Technical Specifications.

6. The letdown demineralizer accomplishes removal of 95% of the radioactive iodine from the letdown stream. The VCT is located downstream of the demineralizer, and the 95% removal is a conservative low value based on plant testing. This assumption applies to both the VCT initial concentration and the cleanup of the letdown stream.

The results of the calculation demonstrate that the dose consequences are enveloped by the RHT rupture accident discussed in Section 15.7.2.1 of the FSAR. Additionally, with no credit for demineralizer cleanup of the VCT contents or the letdown stream, the dose consequences are below "A small fraction of Part 100 limits".

Regenerative Heat Exchanger - Failure Consequences

For the RHE situation, the consequences of a RHE line rupture are bounded by the Small Break LOCA analysis presented in Catawba FSAR Section 15.6.5.

MCGUIRE NUCLEAR STATION

REQUEST FOR RELIEF 95-GO-002

I. COMPONENTS FOR WHICH RELIEF IS REQUESTED

Volume Control Tanks (VCT)

The components for which relief is being requested are manual block valves 1NB066 and 1NB084 for Units 1 and 2 at McGuire. These block valves are installed in relief header configurations shared between the two units. The block valves are locked open in the discharge path of relief valves 1NV170 and 2NV170. These relief valves provide overpressure protection for the Unit 1 VCT and the Unit 2 VCT respectively. The relief valves discharge to one of two available recycle holdup tanks (RHT) so that the radioactive gas or liquid released will be contained within a closed system. Additionally, valve 1NB287 is provided in the relief valve discharges from the Unit 2 VCT. The purpose of the block

valves is to isolate individual RHTs for personnel safety during maintenance, to allow processing of individual RHT contents without uncontrolled discharges into an RHT, and to allow testing of an individual RHT without incapacitating the entire system or the VCT overpressure protection.

The VCTs are part of the chemical and volume control system (NV) and the RHTs are part of the boron recycle system (NB). The RHTs are shared between the two McGuire units. Figure 3 provides a schematic of the VCT/RHT block/relief valves configuration as shared between the two McGuire units.

Regenerative Heat Exchanger (RHE)

The components for which relief is being requested are manual block valves 1NV019 and 2NV019 for McGuire Unit 1 and Unit 2 respectively. These block valves are installed in identical configurations on each of the McGuire units. The block valves are in the discharge path of spring-loaded thermal relief check valves 1NV020 and 2NV020 for McGuire Unit 1 and Unit 2 respectively. Each relief valve provides overpressure protection for the RHE on each of the respective McGuire units in the event of NV malfunction.

These components are part of NV. Figure 4 provides a typical schematic of the RHE block/relief valves configuration for each McGuire unit.

II. CODE REQUIREMENTS

The VCTs and the RHEs block valves are constructed to the requirements of 1971 ASME Code Section III. Overpressure protection requirements are stipulated in Section III, Articles NC-7000 and ND-7000 and permit the installation of stop valves or similar devices on the inlet or discharge of relief valves, but the utilization of "positive controls and interlocks" is required. ASME Code Section III Interpretation III-1-80-67R dated March 1, 1989 states "controls and interlocks ... are pressure sensing devices which would activate the stop valve to provide fluid access to the relief valve, thereby assuring the pressure relieving function is met at all times". However, Interpretations III-1-80-67R as well as III-1-89-25 further rule that administrative controls such as operating procedures governing the use and application of the system (such as normally open or locked open valves in the relief path) may not be construed as "positive controls".

Even though interpretation III-1-80-67R is strictly applicable to later versions of ASME Code Section III, it may be conservatively applied to the 1971 Edition of ASME Code Section III (thru Winter 1971 Addenda) which is applicable to the McGuire design. Consequently, the location of a manual block valve in series with a pressure relieving device without the proper "controls and interlocks" does not conform with the intent of the ASME Code Section III requirements as currently interpreted.

III. CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

Duke Power is requesting relief from the "controls and interlocks" requirements of 1971 ASME Code Section III which states the following:

"NC-7153 (as designated in the 1971 Code Edition thru Winter 1971 Addenda) - No stop valve or other device shall be placed relative to a pressure-relief device so that it could reduce the overpressure protection below that required by these rules, unless such stop valves are constructed and installed with positive controls and interlocks so that the relieving capacity requirements of NC-7400 are met under all conditions of operation of the system and the stop valves. Means shall be provided such that the operability of controls and interlocks can be verified by test."

IV. PROPOSED ALTERNATIVE TO CODE REQUIREMENTS

As an alternate to ASME Code Section III requirements, Duke Power is proposing to maintain proper configuration of the affected components by means of the following administrative controls:

Volume Control Tank

Manual block valves 1NB066, 1NB084, and 1NB287 are physically locked open (LO). Where block valves are used in applications such as these, the valves are clearly identified with the designation LO. This designation is utilized in station documents. Closure of these designated valves requires that a "Red Tag" be hung and a "Removal and Restoration" process be adhered to. These processes require that an evaluation be performed any time that a valve, which is locked open for overpressure protection flow path purposes, must be closed.

Additionally, all locked valves are verified in the correct position on a periodic basis. Valves associated with certain safety related components or functions are verified along with that component or function. Operations Procedure OP/0/A/6200/03, "Boron Recycle System Operating Procedure", specifies that isolation valves 1NB066, 1NB084, and 1NB287 are to be locked open. This ensures that the discharge header has a continuous flow path to the RHTs A or B. Additionally, valves not included in any associated Technical Specifications surveillance requirement are included in PT/1/B/4700/23, "Semi Annual Outside of Containment Locked Valve Position" (performed once every six months), which verifies locked valve positions not already verified by some other procedure. PT/1/B/4700/23 specifies 1NB066, 1NB084, and 1NB287 are to be locked open.

Regenerative Heat Exchanger

Manual block valves 1NV019 and 2NV019 are physically locked-open. Where block valves are used in applications such as these, the valves are clearly designated as LO (see additional information on the LO designation in the preceding paragraph). Operations Procedures OP/1/A/6200/01 and OP/2/A/6200/01, "Chemical and Volume Control System Operating Procedure", specify (respectively for either Unit 1 or Unit 2) that isolation valves 1NV019 and 2NV019 are to be locked open. Valves not included in any associated Technical Specifications surveillance requirement are included in either PT/1/B/4700/24 or PT/2/B/4700/24, "Cold Shutdown Inside Containment Locked Valve Verification" which specify (respectively for either Unit 1 or Unit 2) that 1NV019 and 2NV019 are Locked Open. This procedure is performed at cold shutdown (but not more often than 180 days since it was last performed) to verify locked valve positions not already included in some other procedure.

V. BASIS FOR RELIEF

1. Administrative controls in the form of Operating Procedures and walkdowns supplemented by physical locks and chains serve to ensure the block valves associated with the VCT and RHE remain open. Therefore, it is not anticipated that the overpressure function would be unavailable in the unlikely event that a relief valve does lift.

2. Duke Power maintains compliance with the referenced ASME Code requirements would result in hardships or unusual difficulties without a compensating increase in the level of quality and safety. These block valves help ensure personnel safety and provide the operational flexibility to perform maintenance activities on the affected components. Further, the subject relief valves/block valves arrangement in each of the two applications described above are consistent with the Westinghouse standard design and were included in the original design for the affected McGuire systems. These applications were extensively reviewed and documented throughout the licensing process for McGuire Nuclear Station.

3. The as-built configuration of the relief valves/block valves used at McGuire provides an acceptable level of quality and safety. Misposition (closure) of the block valves, although not desirable, would not render the ECCS inoperable nor adversely affect the ability to safely shutdown the plant.

The following failure consequences of each of the block valves applications at McGuire have been evaluated to show there are no adverse safety consequences as detailed in the subsequent paragraphs.

Volume Control Tank - Failure Consequences

Duke Power Company Calculation CNC-1227.00-00-0064 was performed to determine the dose consequences of a postulated VCT rupture. This analysis is applicable to both Catawba and McGuire Nuclear Stations. The Assumptions and inputs utilized in this calculation are listed in Item V, BASIS FOR RELIEF, of the Catawba portion of this request for relief.

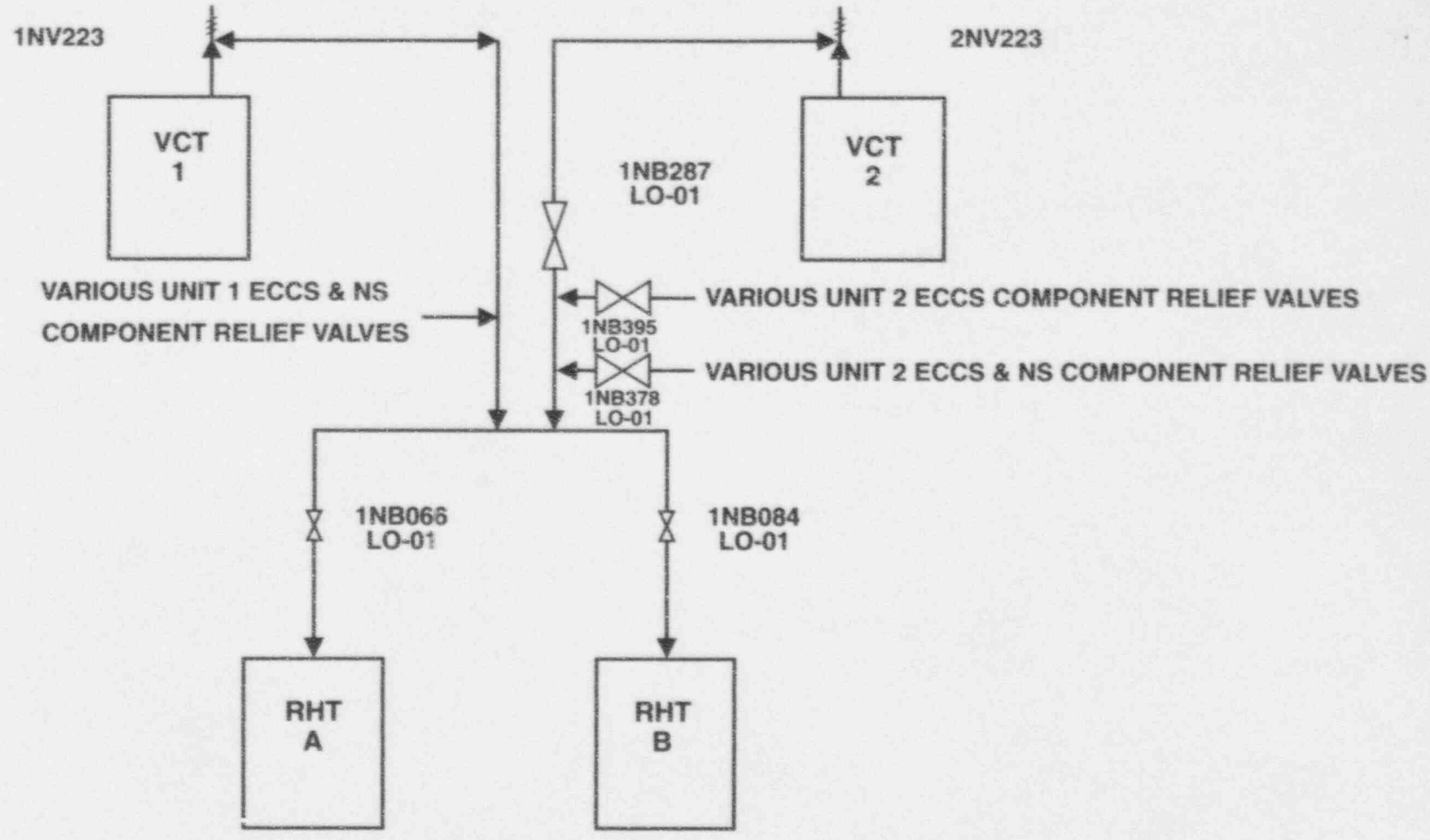
The results of the calculation demonstrate that the dose consequences are enveloped by the RHT rupture accident discussed in Section 15.7.2.1 of the FSAR. Additionally, with no credit for demineralizer cleanup of the VCT contents or the letdown stream, the dose consequences are below "A small fraction of Part 100 limits".

Regenerative Heat Exchanger - Failure Consequences

For the RHE situation, the consequences of a RHE line rupture are bounded by the Small Break LOCA analysis presented in McGuire FSAR Section 15.6.5.

CATAWBA NUCLEAR STATION

Volume Control Tanks

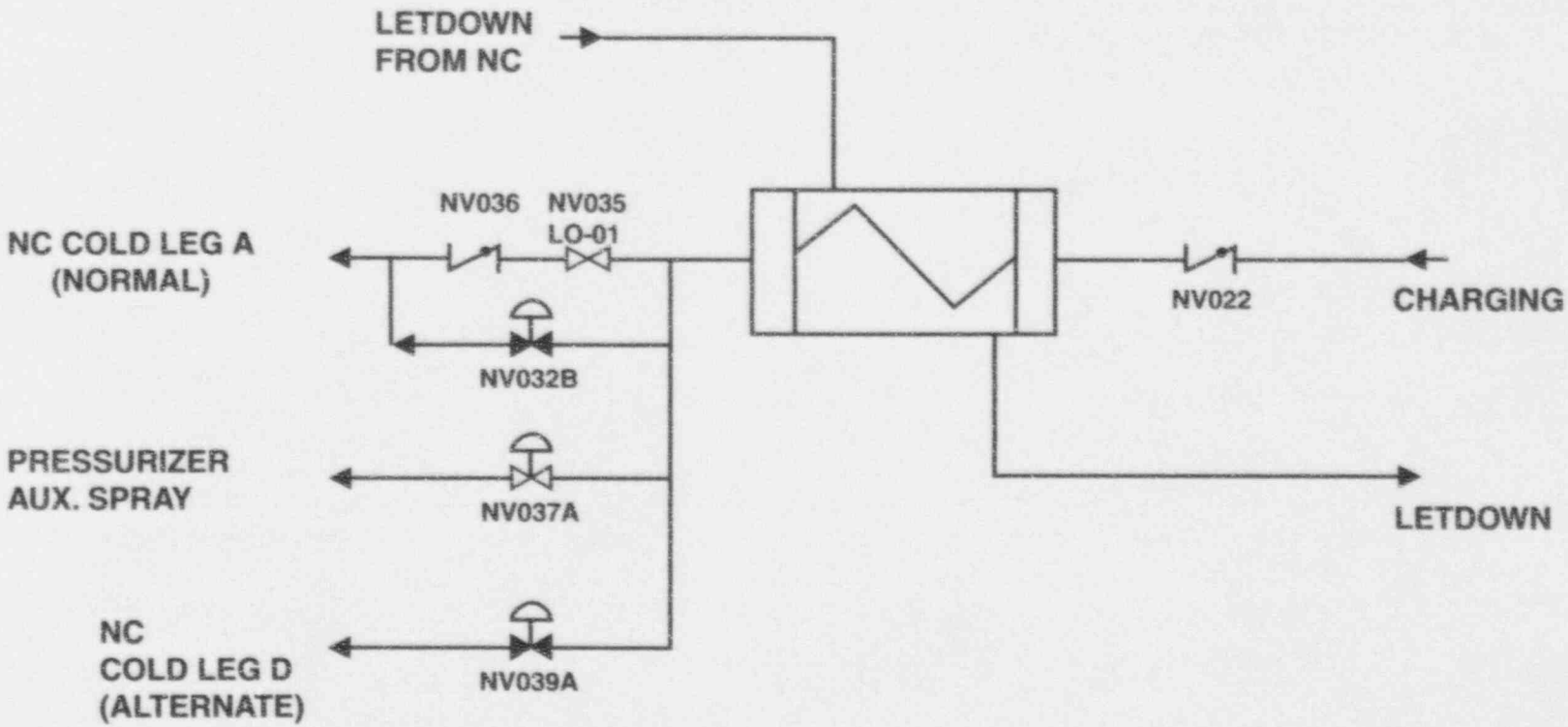


Recycle Holdup Tanks

Duke Power Request for Relief 95-GO-002 - Figure 1

CATAWBA NUCLEAR STATION

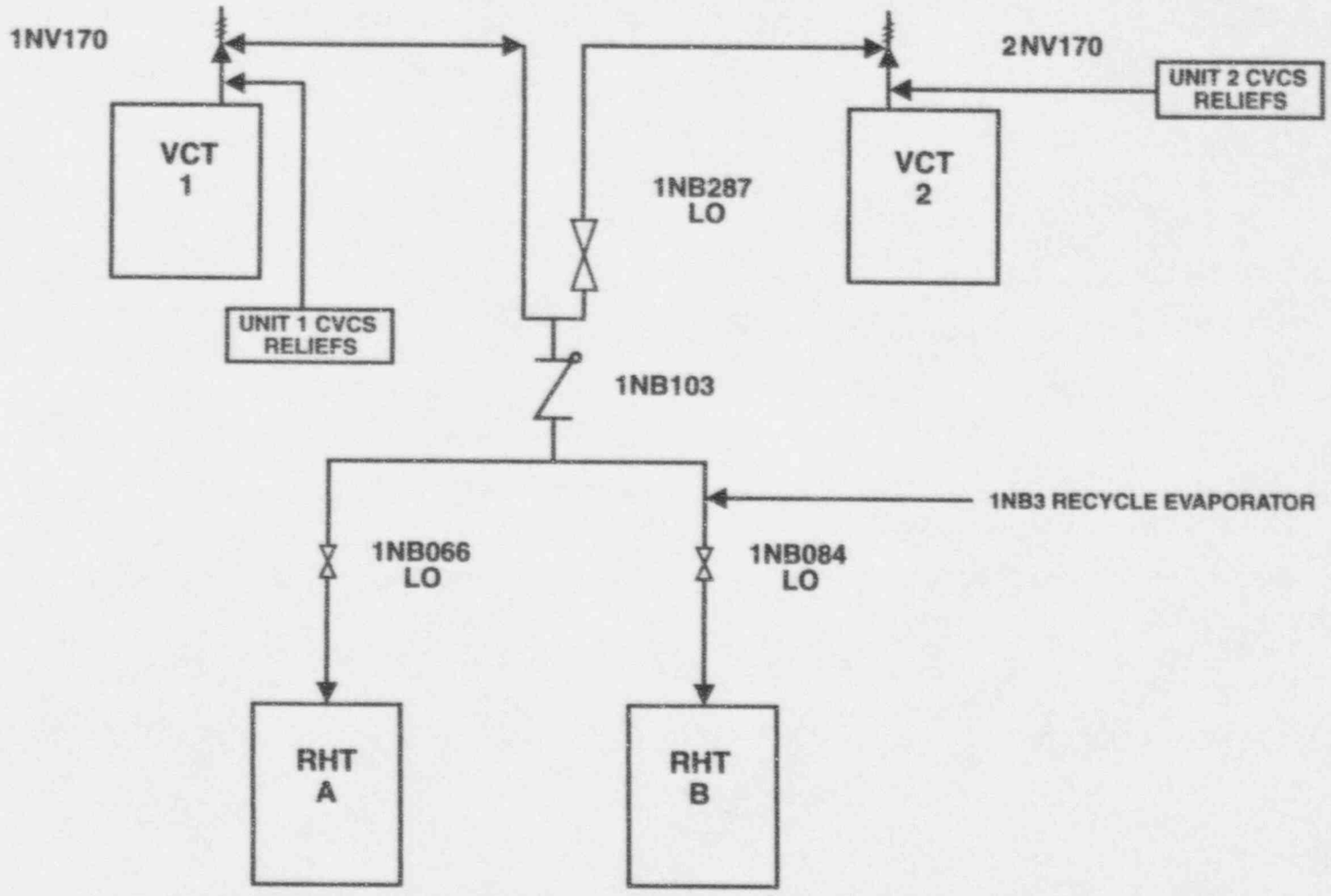
Regenerative Heat Exchangers



Duke Power Request for Relief 95-GO-002 - Figure 2

McGUIRE NUCLEAR STATION

Volume Control Tanks

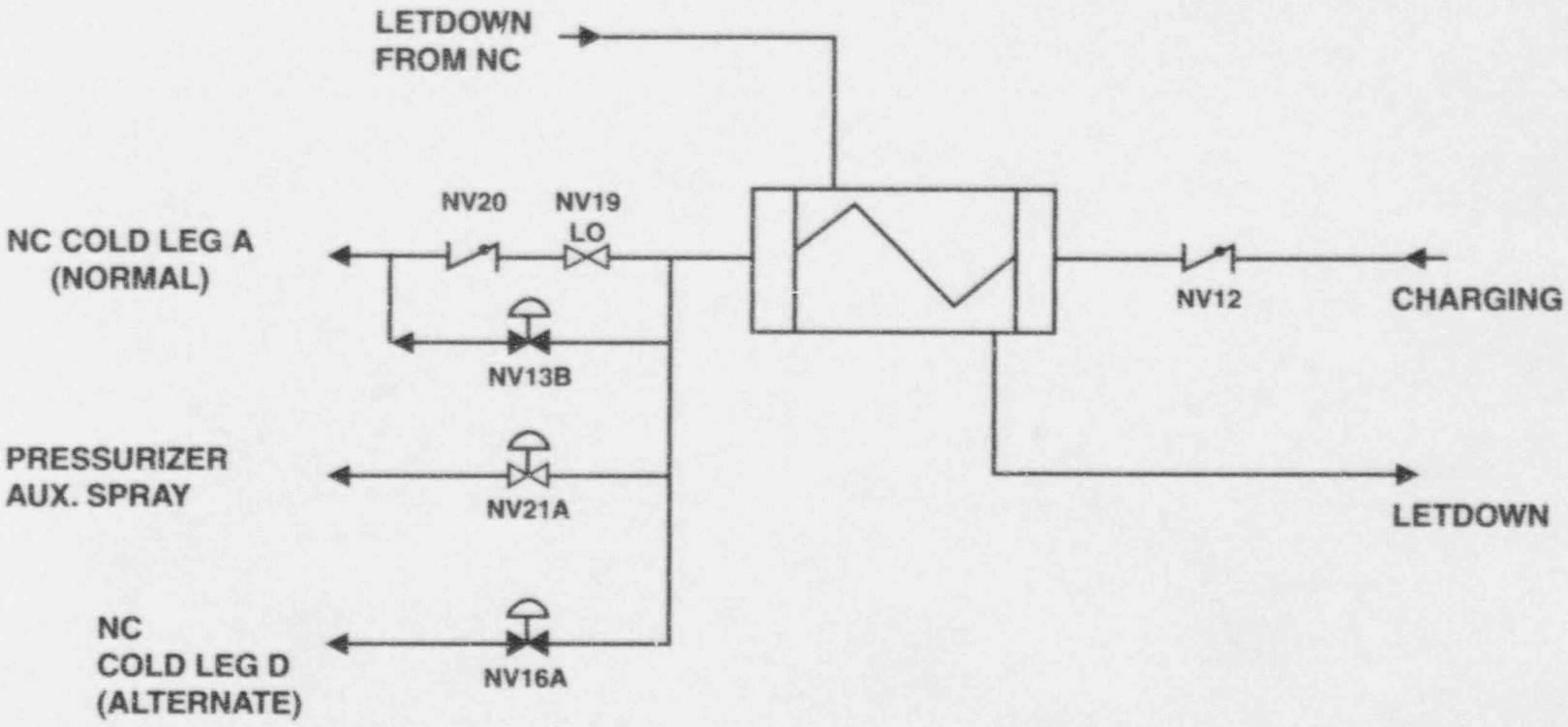


Recycle Holdup Tanks

Duke Power Request for Relief 95-GO-002 - Figure 3

McGUIRE NUCLEAR STATION

Regenerative Heat Exchangers



Duke Power Request for Relief 95-GO-002 - Figure 4