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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555-0001

Subject: Duke Power Company LLC d/b/a Duke Energy Carolinas, LLC (Duke)
Oconee Nuclear Station, Units 1, 2, 3
Docket Nos. 50-269,-270,-287
Third Ten Year Inservice Inspection Interval
Request for Relief No. 04-ON-012, Revision 1

By letter dated December 21, 2004 (ADAMS Accession # ML043630367), Duke Power Company, now Duke Power Company LLC, d/b/a Duke Energy Carolinas, LLC, (Duke) submitted Request for Relief (RFR) 04-ON-012, seeking relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Rules for Inservice Inspection of Nuclear Power Plant Components, for Oconee Nuclear Station, Units 1, 2, and 3 for the duration of the Third Ten Year Inservice Inspection Interval. The third Inservice Inspection Interval for Oconee terminated January 1, 2004 for Unit 1; September 9, 2004, for Unit 2; and January 2, 2005 for Unit 3.

By letter dated July 6, 2006 (ADAMS Accession # ML061930413), Duke subsequently withdrew RFR 04-ON-012, with the statement that Duke intended to resubmit a revised version of the request at a later date. Duke is submitting RFR 04-ON-012 Revision 1, which replaces and supersedes the original request, for NRC review and approval in order to close out the third interval documentation.

The Oconee Reactor Coolant Pressure Boundary was originally designed and built to USAS B31.7 Nuclear Power Piping Code (February 1968) and Addenda (June 1968), which considered the Reactor Coolant Pressure Boundary to be through the first valve.

As a result, certain sections of pipe, specified in the attached request, were designed such that the system leakage test conditions specified for Class 1 cannot be attained without excessive hardship.

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Request for Relief 04-ON-012, Revision 1, is to allow Duke to credit testing performed to date on these sections in lieu of the required system leakage tests.

Duke requests that the NRC authorize these alternatives under 10 CFR 50.55a(a)(3)(ii).

If there are any questions or further information is needed you may contact Corey Gray at (864) 886-6325.

Very truly yours,

Dave Baxter
Site Vice President

Enclosure

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ISI Relief Request File
NRIA File/ELL EC05O
Document Control

1.0 System / Component for Which Relief is Requested:

Relief is requested for sections of ASME Code Class 1 piping and components connected to the Reactor Coolant System (RCS) that are isolated from direct RCS pressure during normal plant operation. These sections of pipe are isolated from the RCS by their configuration because they are up stream of a check valve, between two or more check valves, or between two normally closed valves that remain closed when the unit is in Modes 3, 2, or 1.

At Oconee Nuclear Station, for each unit, there are five such sections of pipe that would result in hardship or unusual difficulty to perform a Class 1 hydrostatic test. All five sections are totally contained within the reactor building. The five sections of pipe are as follows:

1. Between LP-1 and LP-2
2. Between LP-103 and LP-104
3. Between LP-47, CF-11, and CF-12
4. Between LP-48, CF-13, and CF-14
5. Between LP-46 and LP-131

This represents 15 sections of pipe between the three units. The section of pipe between these valves can not be hydrostatically tested as specified in ASME Section XI 1989 edition, no addenda. Attachment 1 contains a table which gives the pipe material, header pipe size, and schedule as well as the length of the header pipe in each section.

For the three Oconee units the start and end dates for the third 10-year interval are as follows:

	Third 10-Year Interval	
Unit	**Start Date**	**End Date**
1	7/15/1994	1/1/2004
2	12/16/1994	9/9/2004
3	12/16/1994	1/02/2005

This document includes two attachments. Attachment 1 contains information from the UFSAR on piping classification and tables with information about the major components in each section of pipe. Attachment 2 contains portions of five drawings, one for each section of pipe addressed by this request for relief. These drawings were taken from the appropriate one line diagrams (Oconee Flow Diagrams). Since these piping sections are identical except for the differences described in other sections of this request a single drawing for each section was included.

Pipe Section 1: Configuration for Valves LP-1 and LP-2:

LP-1 and LP-2 are part of the decay heat removal system. This section of pipe is placed in service after the reactor has been shutdown and depressurized to about 350 psig.

LP-1 and LP-2 are 12 inch gate valves separated by a piece of 12 inch schedule 140 stainless steel pipe. LP-1 is the first valve off the reactor coolant system (RCS) on the decay heat removal line.

	Up Stream LP-1	Between LP-1 & LP-2	Down Stream LP-2
Design Pressure	2500	2500	388
Design Temperature	650	300	300
Pipe size & Schedule	12 in, Sch 140	12 in, Sch 140	12 in, Sch 10s*

* Unit 3 is schedule 40s

See tables in Attachment # 1 for additional information.

Pipe Section 2: Configuration for Valves LP-103 and LP-104:

LP-103 and LP-104 are part of the boron dilution system. These valves would be used during a LOCA to prevent concentration of boron in the reactor vessel. Down stream of LP-104 this pipe is open ended into the reactor building basement. When this section of pipe is placed in service, water from the RCS would discharge to the basement where it could be recycled through the LPI pumps.

LP-103 and LP-104 are 3 inch gate valves separated by a piece of 3 inch schedule 160 stainless steel pipe. LP-103 is the first valve off the decay heat removal line upstream of valve LP-1.

	Up Stream LP-103	Between LP-103 & LP-104	Down Stream LP-104
Design Pressure	2500	2500	400
Design Temperature	650	425	425
Pipe size & Schedule	3 in, Sch 160	3 in, Sch 160	3 in, Sch 10s*

* Unit 3 is 4 inch schedule 40

Valve 3LP-104 is a 4 inch valve

See tables in Attachment # 1 for additional information.

Pipe Section 3: Configuration for Valves LP-47, CF-11, and CF-12

These three valves, LP-47, CF-11, and CF-12, exist in a section of pipe that directs water from the core flood tank or the LPI pump to the reactor vessel. As long as the RCS pressure remains above 600 psig these three valves remain closed.

LP-47 is a 10 inch check valve and CF-12 and CF-11 are 14 inch check valves. This line is part of the emergency core cooling system. During a loss of coolant accident, water would be supplied to the core from the core flood tank through check valves CF-11 and CF-12. This would force closed check valve LP-47. After the core flood tank empties, the RCS pressure would continue to decrease and eventually cooling water would be supplied to the core through check valves LP-47 and CF-12, and check valve CF-11 would be forced closed.

	Down Stream CF-12	Between CF-11, CF-12, & LP-47	Up Stream CF-11 & LP-47
Design Pressure	2500	2500	2500
Design Temperature	650	300	300
Pipe Size & Schedule	14 in, Sch 140	14 in, Sch 140 10 in, Sch 140	14 in, Sch 140 10 in, Sch 160 *

*Unit 1 the 10 inch pipe is schedule 140
See tables in Attachment # 1 for additional information.

Pipe Section 4: Configuration for Valves LP-48, CF-13, and CF-14

These three valves, LP-48, CF-13, and CF-14 exist in a section of pipe that directs water from the core flood tank or the LPI pump to the reactor vessel. As long as the RCS pressure remains above 600 psig these three valves remain closed.

LP-48 is a 10 inch check valve and CF-14 and CF-13 are 14 inch check valves. This line is part of the emergency core cooling system. During a loss of coolant accident, water would be supplied to the core from the core flood tank through check valves CF-13 and CF-14. This would force closed check valve LP-48. After the core flood tank empties, the RCS pressure would continue to decrease and eventually cooling water would be supplied to the core through LP-48 and CF-14, and check valve CF-13 would be forced closed.

	Down Stream CF-14	Between CF-13, CF-14, & LP-48	Up Stream CF-13 & LP-48
Design Pressure	2500	2500	2500
Design Temperature	650	300	300
Pipe Size & Schedule	14 in, Sch 140	14 in, Sch 140 10 in, Sch 140	14 in, Sch 140 10 in, Sch 160 *

* Unit 1 the 10 inch pipe is schedule 140
See tables in Attachment # 1 for additional information.

Pipe Section 5: Configuration for Valves LP-46 and LP-131

LP-46 and LP-131 are part of the alternate pressurizer spray supply line. This line is located entirely within the reactor building. During normal operations this line is full but isolated. During refueling outages this line is placed in service to cool down the pressurizer.

LP-46 and LP-131 are 1-1/2 inch check valves separated by a piece of 1-1/2 inch schedule 160 stainless steel pipe.

	Down Stream LP-46	Between LP-46 & LP-131	Up Stream LP-131
Design Pressure	2500	2500	2500
Design Temperature	670	300	300
Pipe Size and Schedule	1.5 in, Sch 160	1.5 in, Sch 160	1.5 in, Sch 160

See tables in Attachment # 1 for additional information.

When Oconee was constructed, the RCS boundary was defined as all connected piping, valve bodies, pump casings, heat exchangers, or vessels out to and including the first isolation valve. Therefore, all these sections of pipe were installed as B31.7 Class II. For Section XI implementation, these sections between the first and second isolation valves were identified as ASME Class I. (Reference Attachment 1.)

2.0 Code Requirement

The 1989 edition with no addenda of ASME B&PV Code Section XI, Table IWB-2500-1 Examination Category B-P, Item B15.51, Pressure Retaining Boundary, System Hydrostatic Test. Note # 2 in this table states that the 'pressure retaining boundary during the system hydrostatic test shall include all Class 1 components within the system boundary'. This test is to be conducted once during the 10 year interval, either at or near the end of the interval.

3.0 Code Requirement From Which Relief is Requested:

IWB-5222 System Hydrostatic Test

(a) The system hydrostatic test may be conducted at any test pressure specified in Table IWB-5222-1 corresponding to the selected test temperature, provided the requirements of IWB-5230 are met for all ferritic steel components within the boundary of the system (or portion of system) subject to the test pressure. (See IWA-5245.)

Specifically relief is requested from the requirement to extend the hydrostatic test boundary to include all ASME Class I piping and components.

"Specifically, relief is requested as follows:

1. For piping sections 1, 3, 4, and 5, relief is requested from the requirement to perform the System Hydrostatic Test at the pressure prescribed by IWB-5222.
2. For piping section 2, relief is requested from the requirement to perform a hydrostatic pressure test in accordance with IWB-2500, Table IWB-2500-1, Examination Category B-P, Item B15.51.

4.0 Basis for Relief:

In accordance with the requirements of 10 CFR 50.55a(a)(3)(ii), relief is requested from the requirements IWB-5222(a) and IWB-2500, Table IWB-2500-1 Examination Category B-P, Item B15.51.

The following discussion provides the basis for the relief request and approval of the proposed alternative testing in accordance with the provisions in 10CFR 50.55a(a)(3)(ii) due to the hardship that would be imposed by complying with the Code requirement.

Applying RCS hydrostatic pressure to Piping Sections 1, 2, 3, 4, and 5 of the Class 1 piping listed in Section 1.0 of this request would result in a hardship by exposing station personnel to:

- Safety Hazards – ranging from physical exposure to temporary connections whose medium is pressurized to 2155 psig (and in some cases at 600 ° F) to their being "stationed" at open manual valves or near vent/drain valves serving as RCS single isolation pressure and temperature barriers in order to maintain the RCS boundary redundant valve protection requirement of 10CFR 50.55(a)(c)(2)(ii) during the test.

- Radiation Exposure – from activities in containment such as carrying, installing, performing test activities and removing hydro pump or temporary jumpers as needed. Further, activities to install and remove scaffold, as necessary, and removal and replacement of insulation and valve internals, as necessary, would result in additional exposure.

In addition, for piping section 2 performing any type pressure test would expose personnel to the hazards described above without a compensating increase in the level of safety and quality. The end results of a leak in this section of pipe is the same as if the second valve was open, the water ends up in the basement.

According to Technical Specification 3.4.3, RCS Pressure/Temperature Limitations the following are the minimum RCS temperatures for a RCS pressure of 2155 psig during the performance of a RCS hydrostatic test.

Unit	Temperature
Unit 1	260
Unit 2	235
Unit 3	235

Pipe Section 1: Between Valves LP-1 and LP-2

Due to the design parameters for the pipe down stream of LP-2, the only way to pressurize the section of pipe between LP-1 and LP-2 is to have valve LP-1 open during the pressure test. There is an interlock in the open circuit for LP-1 which prevents this valve from being opened when the RCS pressure is above 400 psig. To pressurize the section of pipe between LP-1 & LP-2 from the RCS would require defeating this interlock. Defeating this interlock results in hardship and unusual difficulty since it would require a special and infrequently performed procedure (directions) and could result in additional cool downs and pressure cycles for the reactor coolant system to permit returning the interlock to normal and testing the interlock for proper operation.

Performing a hydrostatic pressure test is, in itself, an infrequent task. Adding to this task the task to bypass interlocks increases the chance for an error.

The RCS is limited to 360 thermal cycles of which about 100 have been used.

Pipe Section 2: Between Valves LP-103 and LP-104

LP-103 and LP-104 are 3 inch gate valves. Since this line is the primary boron dilution flow path, the pipe is open ended down stream of LP-104. Unlike the other sections of pipe described in this request for relief, this pipe does not directly feed another section of pipe. If a leak was to occur between LP-103 and LP-104 the water would end up in the reactor building basement which is where the discharge of LP-104 also terminates.

As described above, performing this hydrostatic pressure test would involve exposing personnel to a potentially hazardous condition without providing any increase in the level of quality and safety over the alternative of doing nothing. A leak between these two valves would result in the piping fluid being directed to the same location, the basement.

For Units 1 and 2, LP-104 is a 3 inch 1500 pound class valve manufactured by Walworth. The body is made of SA 351 CF8M with a design pressure rating of 2485 psig at 650 degrees F. For Unit 3 this valve is a 4 inch 1500 pound class valve manufactured by Velan. The body is made of SA-182 Grade F316 with a design pressure rating of 3600 psig at 100 degrees F.

Pipe Section 3: Between Valves CF-11, CF-12 and LP-47

CF-12 is a 14 inch pressure seal check valve. Hydrostatically testing this section of pipe to the required pressure would require the removal of the check valve bonnet, removal of the valve disc to provide a fill path, and re-assembly of the bonnet so the reactor coolant system (RCS) could be heated to increase pressure. Once the hydrostatic test was completed, it would be necessary to depressurize the RCS so the check valve disc could be re-installed. This process results in an additional heatup to reach the test conditions followed by another cooldown to reassemble the valve. Performing the hydrostatic test creates hardship by inducing an unnecessary thermal cycle for the RCS. Removing and installing the disc would result in a hardship and unusual difficulty on personnel due to the location of these valves and the difficulty to access the valve bonnet.

An alternate fill path through a ½ inch tubing connection was considered. During this filling and pressurizing process the RCS would have to be at or near hydrostatic test pressure to ensure the check valve did not open. The fill water would have to be heated to prevent injecting cold water into a hot RCS. The existing equipment is not designed to handle water at elevated temperatures. Working with water at elevated temperatures and the possibility of a reactivity addition represents hardships to performing the hydrostatic pressure test through this ½ inch line.

Pipe Section 4: Between Valves CF-13, CF-14, and LP-48

CF-14 is a 14 inch pressure seal check valve. Hydrostatically testing this section of pipe to the required pressure would require the removal of the check valve bonnet, removal of the valve disc to provide a fill path, and re-assembly of the bonnet so the reactor coolant system (RCS) could be heated to increase pressure. Once the hydrostatic test was completed, it would be necessary to depressurize the RCS so the check valve disc could be re-installed. This process results in an additional heatup to reach the test conditions followed by another cooldown to reassemble the valve. Performing the hydrostatic test creates hardship by inducing an unnecessary thermal cycle for the RCS. Removing and installing the disc would result in a hardship and unusual difficulty on personnel due to the location of these valves and the difficulty to access the valve bonnet.

An alternate fill path through a ½ inch tubing connection was considered. During this filling and pressurizing process the RCS would have to be at or near hydrostatic test pressure to ensure the check valve did not open. The fill water would have to be heated to prevent injecting cold water into a hot RCS. The existing equipment is not designed to handle water at elevated temperatures.

Working with water at elevated temperatures and the possibility of a reactivity addition represents hardships to performing the hydrostatic pressure test through this ½ inch line.

Pipe Section 5: Between Valves LP-46 and LP-131

LP-46 is a check valve in the alternate supply line to the Pressurizer Spray Nozzle in the top of the pressurizer. To prevent this valve from opening when performing a hydrostatic test, the reactor coolant system would have to be in a solid condition. Operation of the plant in a solid condition is a hardship on the operators and the plant. The concern with solid plant operations is a small increase in temperature will result in a significant increase in pressure due to the positive coefficient of expansion for water.

5.0 Alternate Examinations or Tests:

Pipe Section 1: Between Valves LP-1 and LP-2

Every cold shutdown the pipe between LP-1 through LP-2 is pressurized to 270 psig or greater.

During plant cool down to cold shutdown, the section of pipe down stream of LP-1 is placed in service and remains in service most of the outage. At least once a day an inspection is done of the reactor building looking for leaks and accumulation of boron. This pipe is in an accessible area so any leakage could be identified during one of these inspections and action taken to fix the leak.

Pipe Section 2: Between Valves LP-103 and LP-104

The pipe between LP-103 and LP-104 was not pressurized.

The consequence of not pressure testing this section of pipe is minimal because the purpose of this line is to direct water to the floor of the reactor building in the event of a LOCA. If this section of pipe, down stream of LP-103, were to fail, the worst to occur would be for this line to leak to the floor when placed in service. The reactor coolant would still end up on the floor of the reactor building and eventually get to the sump to be recycled for cooling water.

Pipe Section 3: Between Valves LP-47, CF-11, and CF-12

At the end of each refueling outage the piping between LP-47, CF-11, and CF-12 is tested to verify an open flow path. During the fuel cycle, this section of pipe is pressurized to approximately 600 psig. If leaks were to develop in this line it would be detected by having to fill the core flood tank or having to add nitrogen more frequently during plant operation, by visual observation of boron during a reactor building inspection tour, or increased normal sump rate.

Pipe Section 4: Between Valves LP-48, CF-13, and CF-14

At the end of each refueling outage the piping between LP-48, CF-13, and CF-14 is tested to verify an open flow path. During the fuel cycle, this section of pipe is pressurized to approximately 600 psig. If leaks were to develop in this line it would be detected by having to fill the core flood tank or having to add nitrogen more frequently during plant operation, by visual observation of boron during a reactor building inspection tour, or increased normal sump rate.

Pipe Section 5: Between Valves LP-46 and LP-131

At the beginning of each refueling outage, the section of pipe between LP-46 to LP-131 is place in service at 300 psig to cool down the pressurizer. During this same time there are several reactor building inspection tours looking for leaks. Any boron is cleaned and the area inspected for corrosion, and the source of boron determined.

6.0 Justification for the Granting of Relief

Pursuant to the requirements of 10CFR50.55a(a)(3)(ii), compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety As described above, performing these tests at the required pressure present personnel safety concerns, and creates excess thermal cycles on the Class 1 piping and components.

As described in Section 5.0, a system leakage test was performed on piping sections 1, 3, 4, & 5 at a pressure less than that required for the hydrostatic pressure test. For piping section 2 no hydrostatic or leakage test was performed. A system leakage test at nominal operating pressure has already been established as an acceptable pressure test method based on the endorsement of Code Case N-498-1 in Regulatory Guide 1.147, Revision 12. Since the test pressures used for the piping in this request were lower than nominal operating pressure, N-498-1 does not directly apply.

For the piping sections that were pressure tested, the hydrostatic test does not provide an increase in quality and safety that compensates for the hardship or unusual difficulty. Assuming a crack or defect would behave like a fixed area orifice, it can be shown that the leakage varies proportional to the square root of the ratio of the differential pressure (ref. Crane Technical Paper # 410). For example, if a leakage of L was projected to be present at a pressure of 2155 psig that same leak would exist at a reduced pressure with a reduced magnitude of:

$$\sqrt{\frac{270}{2155}} \times L = 0.35L$$

Inspections that reveal no leakage at 270 psig (where 35% of the leakage produced by 2155 psig would be present for detection during a VT-2 inspection) gives a reasonable assurance that no leakage would be present at 2155 psig. Through wall leakage that would occur at the higher pressure such as RCS pressure, would be expected to reveal itself at lower pressures. It may take longer for some leaks to propagate through the pipe wall at lower pressure and the amount of leakage from a lower pressure test would be reduced, but the leakage would still be visible for a VT-2 examination.

The reduced pressure testing performed as an alternate pressure test for Units 1, 2, & 3 piping covered by this request ranged from 270 psig to approximately 2155 psig except for the section of pipe between LP-103 & LP-104, which was not pressure tested. Pressure in that range is sufficient to detect any through wall leakage in the tested piping and components during the performance of the alternative tests.

Except for the section of pipe between LP-103 & LP-104, each alternate pressure test indicated in this request was performed using a reduced pressure for the specified hold time followed by visual examination (VT-2) to verify no through wall leaks exist in the tested pipe. The test boundaries included all piping described in Part 1.0 of this request.

There are also other plant measures that provide additional evidence that an appropriate level of quality and safety is being maintained:

First, welds within these sections of pipe are within the Class 1 ISI boundary and thus are candidates for both volumetric and surface examinations as required by the ASME Section XI Code.

Second, if a leak were to develop in any of the piping described in this request it could be detected by various means available to the operators, increased frequency for pumping the normal reactor building sump, increased frequency of filling the core flood tanks, and observing changes in the radiation levels in the reactor building are just some of the ways of monitoring for reactor building leakage. In addition, plant Technical Specification 3.4.13 requires that at least once every 72 hours when above MODE 5 a RCS operational leakage determination be performed. Technical Specifications limit the amount of unknown RCS leakage to 1 gpm. If this limit is exceeded then the source must be identified or the reactor must be in MODE 3 in 12 hours and MODE 5 in 36 hours.

During reactor shutdown for outages, numerous inspections are made in the reactor building to look for indications of leakage. Any identified leak is evaluated and dispositioned.

Finally, all of the piping described in this request is inside the reactor building. The reactor building has been designed to contain any leakage and serves as a radiation barrier to protect the health and safety of the public.

Based on the hardships without a compensating increase in quality and safety discussed above, approval of this request is requested. The Nuclear Regulatory Commission has granted similar relief to Catawba Nuclear Station (04-CN-004), Kewaunee Nuclear Power Station, McGuire Nuclear Station (01-03), and Sequoyah Nuclear Station in response to their request for relief from certain ASME Section XI Class 1 pressure testing.

7.0 Implementation Schedule:

Relief is requested for the third ten-year interval of the ISI schedule. The third interval ended as follows:

Unit 1	January 1, 2004
Unit 2	September 9, 2004
Unit 3	January 2, 2005

8.0 Other Information:

This relief request was discussed with the following individuals:

Aaron Best	Core Flood System Engineer – ONS
Basil Carney	Repair and Replacement Engineer – ONS
Charles Henson	Weld Technical Support Supervisor – ONS
Frank Eppler	Low Pressure Injection System Engineer – ONS
James Boughman	Pressure Test Program Manager – GO
Mark Ferlisi	Containment ISI Program Engineer – GO
Mark Pyne	Section XI Inspection Program Manager – GO
Scott Manning	RCS System Engineer – ONS
Vick Dixon	Pressure Testing - Section XI – ONS

Attachment # 1

The following information was copied from the latest revision of the Oconee UFSAR.

3.1.1 Criterion 1 - Quality Standards (Category A)

3.1.1.1 Oconee QA-1 Program

To meet the requirements of 10CFR50 Appendix B, Oconee has defined its QA-1 program. The QA-1 program shall be applied to the "essential systems and components" listed above. The scope of these systems and components is provided in greater detail below. The QA-1 program shall also be applied to the Reactor Protective System, and shall be applied to any systems and components committed to the NRC as being classified as QA-1 per any correspondence subsequent to the orginal QA-1 licensing basis.

Therefore, the general criteria used to determine if a SSC is QA-1 is divided into two categories:

First category - provides general QA-1 criteria based on the original licensing basis of ONS, and

Second Category - provides general criteria for SSCs that were added to the QA-1 licensing basis after issuance of the original operating licenses for ONS.

First Category, Original Oconee QA-1 Licensing Basis

This first category includes the integrity of SSCs essential to prevention and mitigation of the Large Break LOCA coincident with loss of offsite power for the following five SSCs: 1) Reactor Coolant System, 2) Reactor Vessel Internals, 3) Reactor Building, 4) Engineered Safeguards System, and 5) Emergency Electric Power Sources. In addition, 6) Reactor Protective System, another system not addressed in FSAR Section 3.1.1, was interpreted to be included in the QA-1 scope, even though not listed.

Clarification regarding the six SSCs identified above is provided below.

1. Reactor Coolant System

   From a quality assurance perspective, the Reactor Coolant System consists of all connecting piping, valve bodies, pump casings, heat exchangers, or vessels out to and including the first isolation valve. The integrity of the pressure boundary of the connecting piping, valve bodies, pump casings, heat exchangers, or vessels is the function which determines applicability of the quality assurance program.

Attachment # 1

3.2.2.1 System Classifications

Class I

This class is limited to the Reactor Coolant System (RCS) and Reactor Coolant Branch lines, as described herein. The Reactor Coolant Branch lines include connecting piping out to and including the first isolation valve. This section of piping is Class I in material, fabrication, erection, and supports and restraints. A Class I analysis of the piping to the first isolation valve has been completed for the following systems:

1. High Pressure Injection (Emergency Injection)
2. High Pressure Injection (Normal Injection)
3. High Pressure Injection (Letdown)
4. Low Pressure Injection (Decay Heat Removal Drop-line)
5. Low Pressure Injection (Core Flood)
6. Reactor Coolant Drain Lines
7. Pressurizer Spray
8. Pressurizer Relief Valve Nozzles

Modifications that affect the Reactor Coolant System and the Class I portion of the branch lines must demonstrate that the impact on the Class I piping is acceptable. The impact may be assessed by performing a Class I analysis or by other conservative techniques to assure Class I allowable limits are not exceeded. Isolation valves can be either stop, relief, or check valves. Piping 1 inch and less is excluded from Class I.

Attachment # 1

PIPE MATERIAL, SIZE AND SCHEDULE					
Segment	Pipe Material	Header Pipe Diameter & Schedule	Segment Length Unit 1	Segment Length Unit 2	Segment Length Unit 3
LP-1 - LP-2	SA 376 TP 304	12 in Sch. 140	7 ft 6 in.	5 ft 6 in	5 ft 6 in
LP-103 - LP-104	SA 376 TP 304	3 in. Sch. 160 4 in. Sch. 160	6 ft	3 ft	3 ft 6 in 1 ft
CF-12 - LP-47	SA 376 TP 304	10 in. Sch. 140 14 in. Sch. 140	162 ft	158 ft	160 ft
CF-14 - LP-48	SA 376 TP 304	10 in. Sch. 140 14 in. Sch. 140	110 ft	108 ft	108 ft
LP-46 - LP-131	SA 376 TP 304	1.5 in. Sch. 160	100 ft	94 ft	98 ft

This table does not include the length of the small diameter vents and drains that are attached to the header pipe.

OPERATING CONDITIONS						
	Normal		Design		Accident	
Segment	Press.	Temp.	Press.	Temp.	Press.	Temp.
LP-1 - LP-2	**0 ***	**Ambient**	**2500**	**300 °**	**400**	
LP-103 - LP-104	**0 ***	**Ambient**	**2500**	**425 °**	**	
CF-11, CF-12, LP-47	**600**	**Ambient**	**2500**	**300 °**	**600**	**300 °**
CF-13, CF-14, LP-48	**600**	**Ambient**	**2500**	**300 °**	**600**	**300 °**
LP-46 - LP-131	**0 ***	**Ambient**	**2500**	**300 °**	**	

* Normally isolated
** RCS pressure at time of activation

Attachment # 1

NUMBER OF WELDS NOT BEING PRESSURE TESTED TO RCS PRESSURE

	Unit 1		Unit 2		Unit 3	
	Pipe Size	**# of Welds**	**Pipe Size**	**# of Welds**	**Pipe Size**	**# of Welds**
LP-1 and LP-2	**½"**	**6**	**½"**	**11**	**½"**	**5**
	¾"	**5**	**¾"**	**5**	**¾"**	**5**
	12"	**2**	**12"**	**2**	**12"**	**2**
LP 103 and LP-104			**½"**	**6**	**½"**	**4**
			¾"	**2**	**¾"**	**2**
	3"	**2**	**3"**	**3**	**3"**	**3**
					4"	**2**
CF-11, CF-12, & LP-47	**14"**	**12**	**14"**	**12**	**14"**	**11**
	10"	**15**	**10"**	**15**	**10"**	**15**
	1"	**6**	**1"**	**6**	**1"**	**7**
CF-13, CF-14, & LP-48	**14"**	**6**	**14"**	**6**	**14"**	**6**
	10"	**14**	**10"**	**14**	**10"**	**13**
	1"	**4**	**1"**	**5**	**1"**	**5**
LP-46 and LP-131	**1.5"**	**28**	**1.5"**	**19**	**1.5"**	**23**
	1"	**3**	**1"**	**2**	**1"**	**2**

Attachment # 2

Portions of Applicable Oconee Flow Diagrams

Five Sheets – each showing one of the sections.

DESIGN PARAMETERS

LINE NO.	DUKE CLASS	DESIGN PRESSURE	DESIGN TEMP.	MATERIAL	PIPE SPEC. NO.	PIPE SCH. NO.	ISI CLASS
4	C	100 PSIG	200°F	SS	151.3	NOTE 8	B
5	B	200 PSIG	300°F	SS	151.2	NOTE 8	B
8	B	470 PSIG/585 PSIG	300°F/250°F	SS	301.2	NOTE 12	B
12	A	2500 PSIG	650°F	SS	1501.1	NOTE 7	A
	NOTE 26						
23	E	BLDG.	300°F	SS	151.4	NOTE 8	-
26	B	300 PSIG	300°F	SS	301.2	SCH. 20	B
27	H	ATM.	300°F	SS	151.4	NOTE 8	-
34	BC	300 PSIG	300°F	SS	301.3	NOTE 10	B
35	BC	BLDG.	300°F	SS	151.3	NOTE 8	B
36	B	300 PSIG	300°F	SS	301.2	NOTE 10	B
37	B	300 PSIG	300°F	SS	301.2	NOTE 13	B
43	B	2500 PSIG	650°F	SS	1501.2	SCH. 160	B
47	B	2500 PSIG	300°F	SS	1501.2	NOTE 7	A
49	C	3 PSIG	200°F	SS	151.3	NOTE 8	C
50	E	3 PSIG	200°F	SS	151.4	NOTE 8	-
51	BC	300 PSIG	300°F	SS	301.3	NOTE 13	B
52	B	BLDG.	300°F	SS	151.2	SCH. 20	B
58	C	3 PSIG	150°F	SS	151.3	NOTE 8	B
59	E	ATM.	150°F	SS	151.4	NOTE 8	-
68	B	300 PSIG	300°F	SS	301.2	SCH. 40S	B
69	BC	300 PSIG	300°F	SS	301.3	SCH. 80	B
77	B	300 PSIG	300°F	SS	301.2	SCH. 10	B
						NOTE 23	-
82	B	2500 PSIG	300°F	SS	2701.1	-	A
83	B	2500 PSIG	650°F	SS	2701.1	-	A
97	B	2500 PSIG	425°F	SS	1501.2	NOTE 7	A
99	B	2500 PSIG	425°F	SS	2701.1	SCH. 80	A
107	E	300 PSIG	300°F	SS	301.4	NOTE 10	-
111	E	470 PSIG/585 PSIG	300°F/250°F	SS	301.4	SCH. 40S	-
113	B	470 PSIG/585 PSIG	300°F/250°F	SS	301.4	SCH. 40S	-
114	H	400 PSIG	425°F	SS	301.4	SCH. 40	-

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PIPE SCH. NO.	ISI CLASS
NOTE 8	B
NOTE 8	B
NOTE 12	B
NOTE 7	A
NOTE 8	-
SCH. 20	B
NOTE 8	-
NOTE 10	B
NOTE 8	B
NOTE 10	B
NOTE 13	B
SCH. 160	B
NOTE 7	A
NOTE 8	C
NOTE 8	-
NOTE 13	B
SCH. 20	B
NOTE 8	B
NOTE 8	-
SCH. 40S	B
SCH. 80	B
SCH. 10	B
NOTE 23	-
-	A
-	A
NOTE 7	A
SCH. 80	A
NOTE 10	-
SCH. 40S	-
SCH. 40S	-
SCH. 40	-

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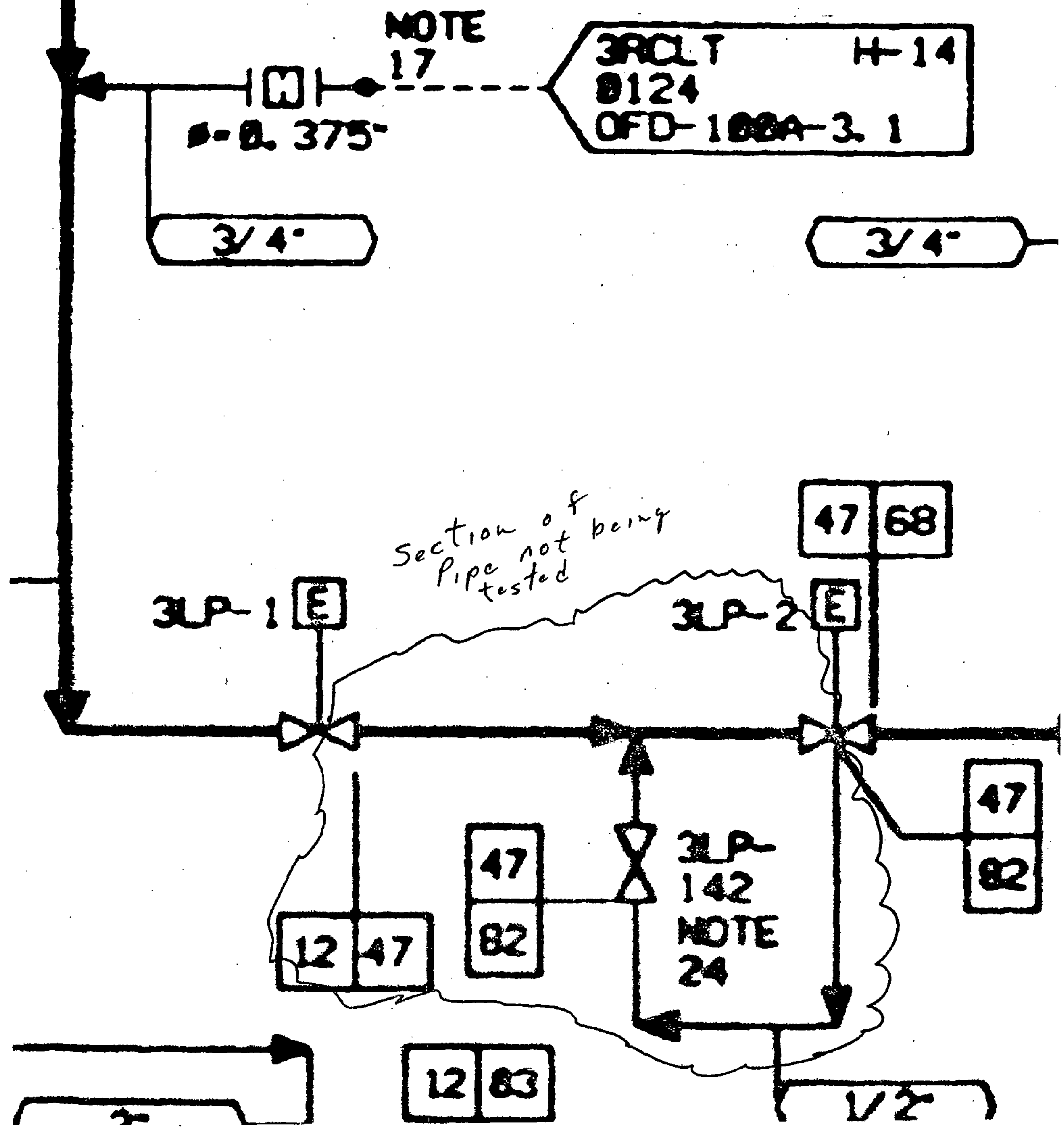

DESIGN PARAMETERS

LINE NO.	DUKE CLASS	DESIGN PRESSURE	DESIGN TEMP.	MATERIAL	PIPE SPEC. NO.	PIPE SCH. NO.	ISI CLASS
4	C	100 PSIG	200°F	SS	151.3	NOTE 8	B
5	B	200 PSIG	300°F	SS	151.2	NOTE 8	B
8	B	470 PSIG/505 PSIG	300°F/250°F	SS	301.2	NOTE 12	B
12	A	2500 PSIG	650°F	SS	1501.1	NOTE 7	A
	NOTE 20						
23	E	BLDG.	300°F	SS	151.4	NOTE 8	-
26	B	300 PSIG	300°F	SS	301.2	SCH. 20	B
27	H	ATM.	300°F	SS	151.4	NOTE 8	-
34	BC	300 PSIG	300°F	SS	301.3	NOTE 10	B
35	BC	BLDG.	300°F	SS	151.3	NOTE 8	B
36	B	300 PSIG	300°F	SS	301.2	NOTE 10	B
37	B	300 PSIG	300°F	SS	301.2	NOTE 13	B
43	B	2500 PSIG	650°F	SS	1501.2	SCH. 160	B
47	B	2500 PSIG	300°F	SS	1501.2	NOTE 7	A
49	C	3 PSIG	200°F	SS	151.3	NOTE 8	C
50	E	3 PSIG	200°F	SS	151.4	NOTE 8	-
51	BC	300 PSIG	300°F	SS	301.3	NOTE 13	B
52	B	BLDG.	300°F	SS	151.2	SCH. 20	B
58	C	3 PSIG	150°F	SS	151.3	NOTE 8	B
59	E	ATM.	150°F	SS	151.4	NOTE 8	-
68	B	300 PSIG	300°F	SS	301.2	SCH. 40S	B
69	BC	300 PSIG	300°F	SS	301.3	SCH. 80	B
77	B	300 PSIG	300°F	SS	301.2	SCH. 10	B
						NOTE 23	-
82	B	2500 PSIG	300°F	SS	2701.1	-	A
83	B	2500 PSIG	650°F	SS	2701.1	-	A
97	B	2500 PSIG	425°F	SS	1501.2	NOTE 7	A
98	B	2500 PSIG	425°F	SS	2701.1	SCH. 80	A
107	E	300 PSIG	300°F	SS	301.4	NOTE 10	-
111	E	470 PSIG/505 PSIG	300°F/250°F	SS	301.4	SCH. 40S	-
113	B	470 PSIG/505 PSIG	300°F/250°F	SS	301.4	SCH. 40S	-
114	H	400 PSIG	425°F	SS	301.4	SCH. 40	-

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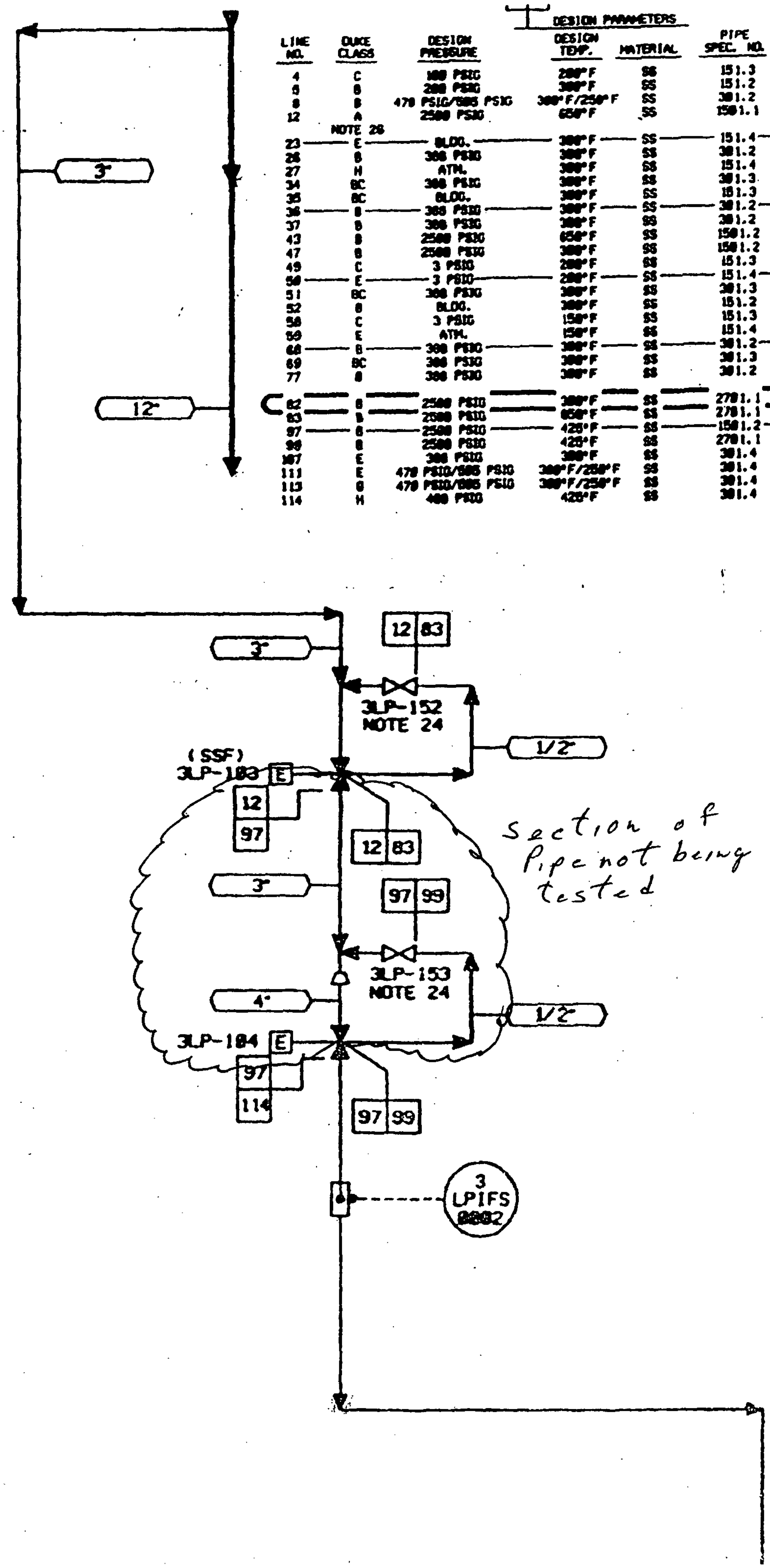


section of Pipe not being tested

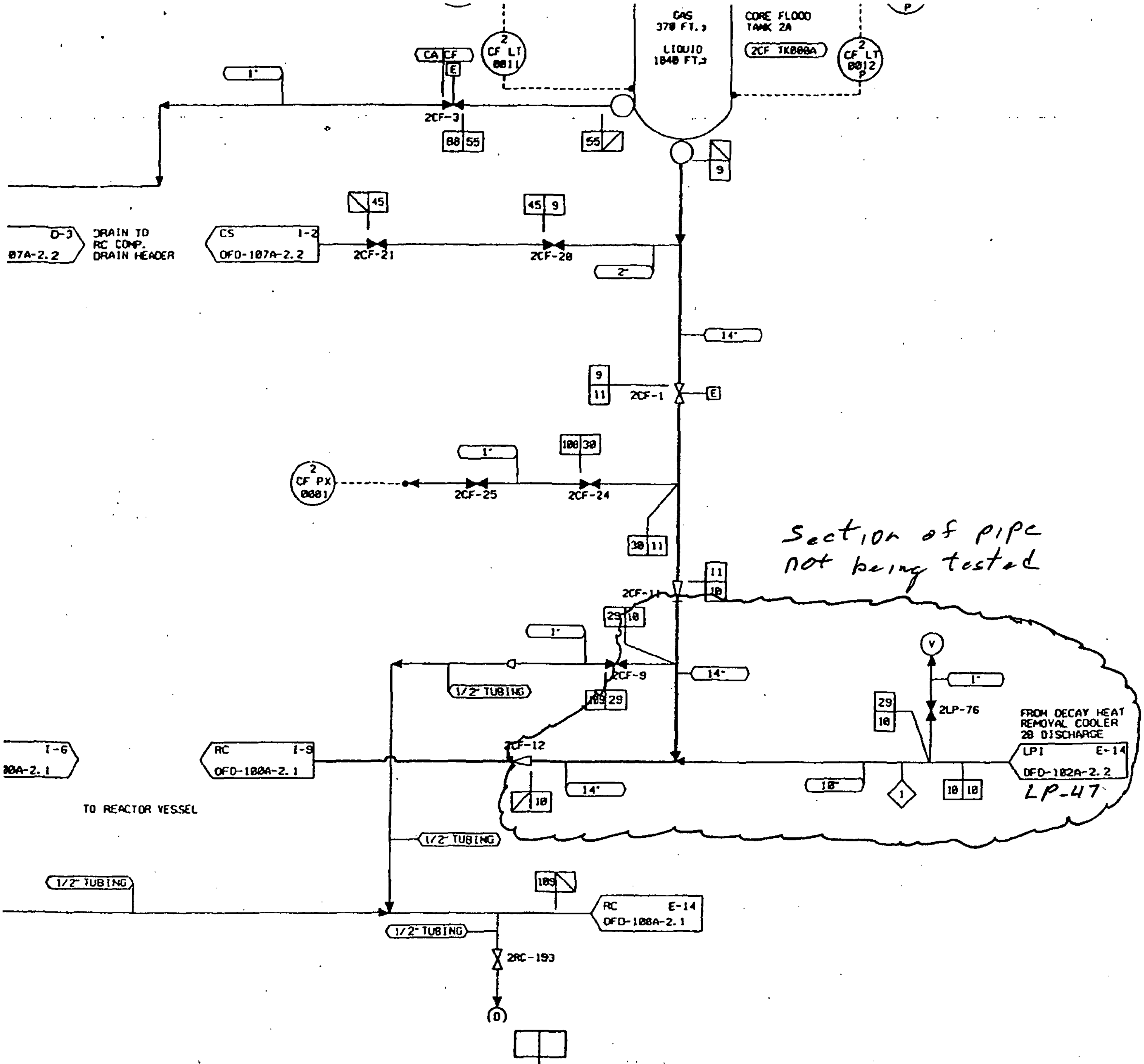
I

H

G

F

F



DESIGN PARAMETERS

LINE NO.	DUKE CLASS	DESIGN PRESSURE	DESIGN TEMP.	MATERIAL	PIPE SPEC. NO.	PIPE SCH. NO.	ISI CLASS
9	B	700 PSIG	300°F	SS	601.2	NOTE 6	B
10	A	2500 PSIG	300°F	SS	1501.1	NOTE 2	A
11	B	2500 PSIG	300°F	SS	1501.2	NOTE 2	B
16	E	150 PSIG	300°F	SS	151.4	NOTE 3	-
24	F	100 PSIG	200°F	CS	150.4	SCH. 160	B
29	AC	2500 PSIG	300°F	SS	1501.3	NOTE 2	A
30	BC	2500 PSIG	300°F	SS	1501.3	NOTE 2	B
31	BC	700 PSIG	300°F	SS	601.3	NOTE 6	B
42	E	100 PSIG	300°F	CS	150.4	NOTE 8	-
45	E	700 PSIG	300°F	SS	601.4	NOTE 6	-
55	BC	700 PSIG	300°F	SS	601.3	SCH. 80S	B
57	BC	700 PSIG	300°F	SS	601.3	SCH. 40	B
61	E	700 PSIG	300°F	SS	60.4	SCH. 80S	-
88	BC	700 PSIG	650°F	SS	601.3	SCH. 80S	B
		NOTE 13	NOTE 13				
101	B	2500 PSIG	300°F	SS	2701.1a	-	B
108	E	2500 PSIG	300°F	SS	1501.4	NOTE 2	-
109	E	2500 PSIG	300°F	SS	1501.3	SCH. 80S	-
					2701.2a	-	-

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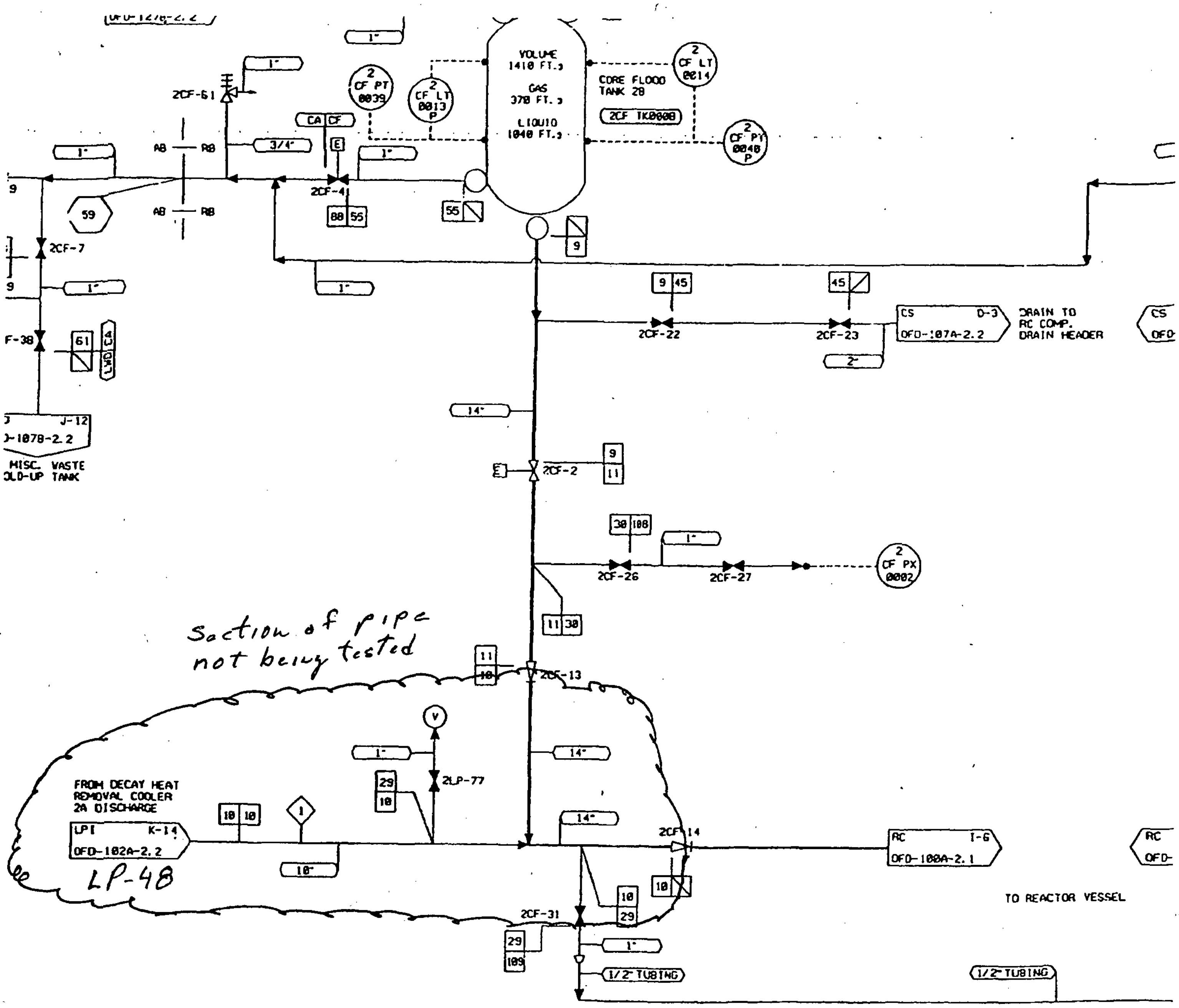

DESIGN PARAMETERS

LINE NO.	DUKE CLASS	DESIGN PRESSURE	DESIGN TEMP.	MATERIAL	PIPE SPEC. NO.	PIPE SCH. NO.	ISI CLASS
9	B	700 PSIG	300°F	SS	601.2	NOTE 6	B
10	A	2500 PSIG	300°F	SS	1501.1	NOTE 2	A
11	B	2500 PSIG	300°F	SS	1501.2	NOTE 2	B
16	E	150 PSIG	300°F	SS	151.4	NOTE 3	-
24	F	100 PSIG	200°F	CS	150.4	SCH. 160	B
29	AC	2500 PSIG	300°F	SS	1501.3	NOTE 2	A
30	BC	2500 PSIG	300°F	SS	1501.3	NOTE 2	B
31	BC	700 PSIG	300°F	SS	601.3	NOTE 6	B
42	E	100 PSIG	300°F	CS	150.4	NOTE 8	-
45	E	700 PSIG	300°F	SS	601.4	NOTE 6	-
55	BC	700 PSIG	300°F	SS	601.3	SCH. 80S	B
57	BC	700 PSIG	300°F	SS	601.3	SCH. 40	B
61	E	700 PSIG	300°F	SS	60.4	SCH. 80S	-
88	BC	700 PSIG NOTE 13	650°F NOTE 13	SS	601.3	SCH. 80S	B
101	B	2500 PSIG	300°F	SS	2701.1a	-	B
108	E	2500 PSIG	300°F	SS	1501.4	NOTE 2	-
109	E	2500 PSIG	300°F	SS	1501.3	SCH. 80S	-
					2701.2a	-	-

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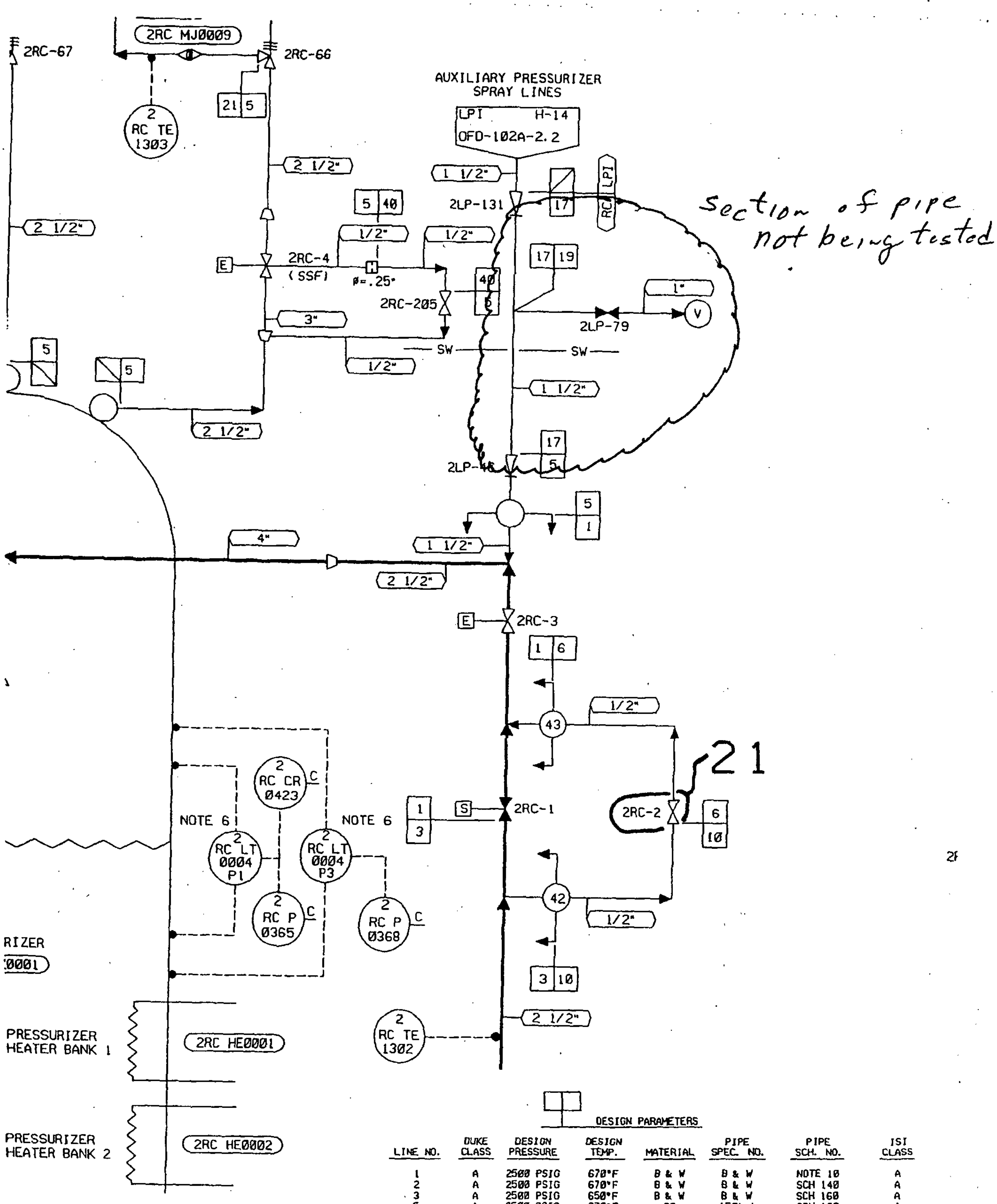

DESIGN PARAMETERS

LINE NO.	DUKE CLASS	DESIGN PRESSURE	DESIGN TEMP.	MATERIAL	PIPE SPEC. NO.	PIPE SCH. NO.	ISI CLASS
1	A	2500 PSIG	670°F	B & W	B & W	NOTE 10	A
2	A	2500 PSIG	670°F	B & W	B & W	SCH 140	A
3	A	2500 PSIG	650°F	B & W	B & W	SCH 160	A
5	A	2500 PSIG	670°F	SS	1501.1	SCH 160	A
6	AC	2500 PSIG	670°F	SS	1501.3	SCH 160	A
7	BC	2500 PSIG	670°F	SS	1501.3	SCH 160	B
10	AC	2500 PSIG	650°F	SS	1501.3	SCH 160	A
17	B	2500 PSIG	300°F	SS	1501.2	NOTE 3	A
19	BC	2500 PSIG	300°F	SS	1501.3	NOTE 3	A
21	C	700 PSIG	500°F	SS	601.3	NOTE 2	C
					2701.1	NOTE 2	
27	B	2500 PSIG	300°F	SS	1501.2	SCH 160	B
40	B	2500 PSIG	300°F	SS	2701.1	NOTE 2	A