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March 22, 2011

SOUTHERN COMPANY

Docket Nos.: 50-348
50-364

NL-11-0464

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D. C. 20555-0001

Joseph M. Farley Nuclear Plant
Proposed Alternative for the Fourth ISI Interval

Ladies and Gentlemen:

Pursuant to 10 CFR 50.55a(a)(3)(ii), Southern Nuclear Operating Company (SNC) hereby requests NRC approval of a proposed alternative to the specified ASME Boiler and Pressure Vessel Code Section XI requirements.

The components affected by this proposed alternative are portions of small diameter ASME Boiler and Pressure Vessel Code, Section III, Code Class 2 piping, tubing, valves, fittings, and support elements connected to the reactor coolant system (RCS) pressurizer above the normal water level in the pressurizer. The proposed alternative would allow the affected piping, tubing, fittings, valves, and supports to remain as designed and constructed (Code Class 2) in lieu of upgrading the current design configuration and replacing these items with items constructed to ASME Section III (Code Class 1). The details of this request are contained in the enclosure.

Approval is requested by February 28, 2012.

This letter contains no NRC commitments. If you have any questions, please contact Jack Stringfellow at (205) 992-7037.

Sincerely,

Mark J. Ajluni

M. J. Ajluni
Nuclear Licensing Director

MJA/LPH/lac

Enclosure: Proposed Alternative FNP-ISI-ALT-11, Version 1.0 Per 10 CFR 50.55a(a)(3)(ii)

cc: Southern Nuclear Operating Company
Mr. J. T. Gasser, Executive Vice President
Mr. L. M. Stinson, Vice President – Farley
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RTYPE: CFA04.054

U. S. Nuclear Regulatory Commission
Mr. V.M. McCree, Regional Administrator
Mr. R. E. Martin, NRR Project Manager – Farley
Mr. E. L. Crowe, Senior Resident Inspector – Farley
Mr. P. Boyle, NRR Project Manager

Joseph M. Farley Nuclear Plant – Units 1 & 2
Proposed Alternative for the Fourth ISI Interval

Enclosure

Proposed Alternative FNP-ISI-ALT-11, Version 1.0
Per 10 CFR 50.55a(a)(3)(ii)

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)

Plant Site - Unit: Farley Nuclear Plant (FNP) Units 1 and 2

Interval Dates: 4th ISI Interval – December 1, 2007 through November 30, 2017

Requested Date for Approval: Approval is requested by February 28, 2012.

ASME Code Components Affected:

The components affected by this proposed alternative are portions of small diameter ASME Boiler and Pressure Vessel Code, Section III, Code Class 2 piping, tubing, valves, fittings, and support elements connected to the reactor coolant system (RCS) pressurizer above the normal water level in the pressurizer. Specifically these components are the:

- Pressurizer Upper Level Instrumentation lines (See illustrative sketch on Attachment 1)
- Pressurizer Safety Loop Seal Drain Lines (See illustrative sketch on Attachment 2)
- Pressurizer Sample and Vent lines (See illustrative sketch on Attachment 3)
- Pressurizer Spray Valve Bypass Line (See illustrative sketch on Attachment 4)

The affected lines and valves discussed above are shown on the P&IDs (see Attachments 5 through 8) listed in Table 1 for Unit 1 and Table 2 for Unit 2. *It should be noted that some items such as instrument isolation valves located at each instrument do not actually have an assigned number and may not be shown on the P&IDs.*

Applicable Code Edition and Addenda:

Section 50.55a(c) of 10 CFR requires that components which are part of the reactor coolant pressure boundary must meet the requirements for Class 1 components in Section III of the ASME Code, except that components which are connected to the reactor coolant system and are part of the reactor coolant pressure boundary as defined in § 50.2 need not meet the Class 1 requirements provided that in the event of postulated failure of the component during normal reactor operation, the reactor can be shut down and cooled down in an orderly manner, assuming makeup is provided by the reactor coolant makeup system.

Based on the above requirements, the affected components were designated as Class 2 and designed, constructed, and installed to the following Codes, as follows:

Piping, fittings, and tubing - Subsection NC of the 1971 Edition of the ASME Boiler and Pressure Vessel Code of Section III with Addenda through Summer 1971.

Valves - Subsection NC of the 1971 Edition of Section III with Addenda through Winter 1971, except that certain valves were purchased and installed in both units per the 1974 Edition of Section III as part of subsequent design changes.

Supporting Elements - Subsubarticle NC-3674 of the 1971 Edition of Section III with Addenda through Summer 1971 required that (pending completion of Subsection NF), supporting elements be designed to ANSI B31.1.0-1967, Paragraphs 120 and 121.

Reason for Request:

Westinghouse Nuclear Safety Advisory Letter (NSAL), NSAL-00-006, "Pressurizer Upper Level Instrument Line Safety Classification," was issued April 3, 2000. This letter identified an issue where a break in an instrument line for the upper portion (steam side) of the pressurizer level instrument may result in a rapid depressurization of the RCS sufficient to cause an Emergency Core Cooling system (ECCS) actuation based on low pressurizer pressure. Subsequently, Westinghouse NSAL 07-09, Revision 1, "Safety Classification of Small Lines Connected to the Pressurizer Steam Space," was issued August 11, 2008. This NSAL expanded the scope of NSAL-00-006 to include all small diameter lines connected to the pressurizer steam space. In these letters, Westinghouse indicated that the aforementioned Class 2 small diameter lines may potentially have been misclassified, given that a break in these lines may not result in a shutdown and cooldown "in an orderly manner."

After review of the referenced NSALs, ANSI N18.2, the regulatory requirements, and the Farley Nuclear Plant specific design and analysis, SNC concluded that the lines identified in the "ASME Code Components Affected" section of this alternative are misclassified as Class 2.

Proposed Alternative:

The proposed alternative would allow the affected piping, tubing, fittings, valves, and supports to remain as designed and constructed (Code Class 2) in lieu of upgrading the current design configuration and replacing these items with items constructed to ASME Section III (Code Class 1).

Basis for Use:

SNC has determined that upgrading the affected Class 2 components to ASME Code, Section III, Subsection NB (Class 1), would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. The basis for this conclusion is presented below.

Substantial time and resources to upgrade the plant design configuration and perform plant modification work would be required to replace the affected items. The items that would require replacement are located in highly congested areas with narrow openings in high radiation areas within the pressurizer housing. Access to safely perform the replacement work would require construction of

scaffolding/platforms in tightly confined areas within the pressurizer housing, resulting in high personnel radiation exposure. It is estimated that nearly 3000 man-hours and approximately 2.8 person-REM would be required to upgrade the affected lines for each Farley unit.

To justify the conclusion "without a compensating increase in the level of quality and safety", a comparison was made between the Section III requirements in Subsection NB for Class 1 components and Subsection NC for Class 2 components using the applicable editions and addenda of the ASME Code. The comparison considered each Article of Subsections NB and NC (covering the areas of materials, design, fabrication and installation, examination, testing, protection against overpressure, nameplates, stamping and reports) and determined whether the differences were technical, quality, or administrative requirements. Differences in Section III administrative requirements such as certification and stamping, furnishing of a stress report, marking of items, etc., although affecting literal compliance, were determined to not reduce the quality or safety of the items. There were few differences in quality requirements between Class 1 and Class 2 because most quality requirements are contained in the General Requirements, Subsection NA and are equally applicable to both Class 1 and Class 2. No differences in quality requirements were identified that would reduce the quality or safety of the items.

There were some differences in technical requirements between Class 1 and Class 2 in the areas of piping and tubing material examination, piping design, valve design, and supports. However, replacing the affected items would provide minimal increase in quality and safety, as demonstrated in the following paragraphs discussing the technical requirement differences.

Material Examination

For piping and tubing material examinations, the later provisions of NB-2510(a) in the Summer 1983 Addenda exempted 1" and less seamless pipe, tubes, and fittings from the examination requirements of NB-2500, thus making the Class 1 rules the same as Class 2 and eliminating the technical differences. Since the NRC accepted the Summer 1983 Addenda for use in 10 CFR 50.55a, had the design and construction been completed at a later time; the Code Class 2 installed configuration would meet the Code Class 1 material examination requirements. Therefore, no increase in quality and safety would be realized by using the Class 1 material examination requirements.

Piping Design

For piping design, there are considerable differences between Class 1 and Class 2 requirements but these differences were eliminated by the Summer 1975 Addenda change in NB-3630(d). This change allowed 1 inch and smaller Class 1 piping to be designed to NC-3600, thus making the Class 1 design rules the same as Class 2. Since the NRC accepted the Summer 1975 Addenda for use in 10 CFR 50.55a, had the piping design and construction been completed at a later time; the Code Class 2 installed configuration would meet the Code Class 1 piping design

requirements. Therefore, no increase in quality and safety would be realized by using the Class 1 piping design requirements.

Valve Design

In the area of valve design, the requirements in NB-3500 are considerably different than the requirements in NC-3500. However, the small valves identified in the affected components section of this request have been evaluated to the applicable requirements in NB-3500. The valves were found to meet the technical requirements of NB-3500 applicable to small valves. Therefore, there are no technical differences between the installed Class 2 valves and the requirements for Class 1 valves that would reduce the assurance that the valves will perform their intended safety function. Therefore, no increase in quality and safety would be realized by replacing the valves with valves constructed to Class 1 requirements.

Condensate Receiver Design

Each pressurizer upper level instrumentation line has a condensate receiver (see Attachment 1). Each receiver is made from a 1-1/2 inch SA-182, 6000# socket welded tee with appropriate insert reducing bushings to mate with the ¾ inch inlet piping and the 3/8 inch outlet tubing.

Because the tee is greater than 1 inch in diameter, the NB-2510(a) rules for material examination (discussed above) do not apply. Per ASME Section III, NB-2551, a Class 1 tee is required to have a liquid penetrant (PT) examination of all accessible internal and external surfaces, in addition to any other examinations required by the material specification for SA-182 material. The PT is not a requirement for a Class 2 tee. This is considered insignificant, because after installation the three attachment welds received a PT examination per the requirements of ASME Section III, NC-5250. This PT would have examined a minimum of a 1 inch area of the tee at each of the three welds. Therefore, for a 1-1/2 inch tee the most critical areas were examined. Additionally, the tees and bushings have been in service for approximately 30 years with no evidence of problems during normal operation or during ASME Section XI pressure testing.

Because the tee is greater than 1 inch in diameter, the NB-3630(d) rules for piping design (discussed above) do not apply. The significance of this is minimal because the Farley piping specification material requirements and pressure class requirements for Class 1 and Class 2 fittings are the same.

In conclusion, there are no technical differences between the installed Class 2 condensate receivers and the requirements for Class 1 condensate receivers that would reduce the assurance that they will perform their intended safety function. Therefore, no increase in quality and safety would be realized by replacing the condensates receivers with those constructed to Class 1 requirements.

Support Elements

For Class 2, NC-3674 of the 1971 Edition of Section III required that support elements be designed to ANSI B31.1.0-1967, Paragraphs 120 and 121. For Class 1, NB-3674 required that support elements be designed per ANSI B31.7-1969. These two Codes were compared and it was determined that there were no technical differences that would affect the quality of the support element. Therefore, no increase in quality and safety would be realized by replacing the ANSI B31.1 support elements with ANSI B31.7 support elements.

Conclusion

From the preceding discussions, it is concluded that for the piping, tubing, and valves identified in this request, including the supports, the differences between Section III requirements for Class 1 and Class 2 construction would have minimal impact on the ability of these items to perform their intended safety function.

Further, the preceding discussions have demonstrated that upgrading the affected piping and valves to ASME Code, Section III, Class 1 requirements would result in a hardship or unusual difficulty because the scope of the change would require substantial time, resources, and substantial dose to upgrade the current design configuration without a compensating increase in the level of quality and safety. Therefore, approval of this alternative is requested in accordance with 10 CFR 50.55a(a)(3)(ii).

Duration of Proposed Alternative:

SNC requests approval of the proposed request for alternative for the life of the plant (present design life plus extended operation through license renewal). No undue risk to the public health and safety is presented by this request.

Precedents:

Three plants submitted similar ISI requests for alternative and received a Safety Evaluation Report (SER):

Comanche Peak Steam Electric Station Letter, dated September 30, 2002, to USNRC; Docket Nos. 50-445 and 50-446, "Relief Request A-2 for Unit 1 and A-9 for Unit 2 Relief from 10 CFR 50.55a Requirements for Class 1," and the associated NRC SER (ML031040482), dated April 14, 2003.

Wolf Creek Nuclear Operating Corporation Letter, dated November 2, 2004, to USNRC; Docket No. 50-482, "10 CFR 50.55a Request for Alternative Requirements for ASME Class 1 Items Connected to the Upper Portion (Steam Side) of the Pressurizer" and the associated NRC SER (ML051520526) dated May 31, 2005.

FPL Energy Seabrook Station Letter, dated December 11, 2008, to NRC; Docket No. 50-443, "10 CFR 50.55a Request for Alternative Requirements for ASME Class 1 Upper Level Instrumentation Lines on the Pressurizer," and the associated NRC SER (ML092050184) dated August 21, 2009.

References:

American Nuclear Society N-18.2, "Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants," August 1970 Draft issued in November 1970.

Westinghouse Nuclear Safety Advisory Letter (NSAL-00-006), "Pressurizer Upper Level Instrument Line Safety Classification," dated April 3, 2000.

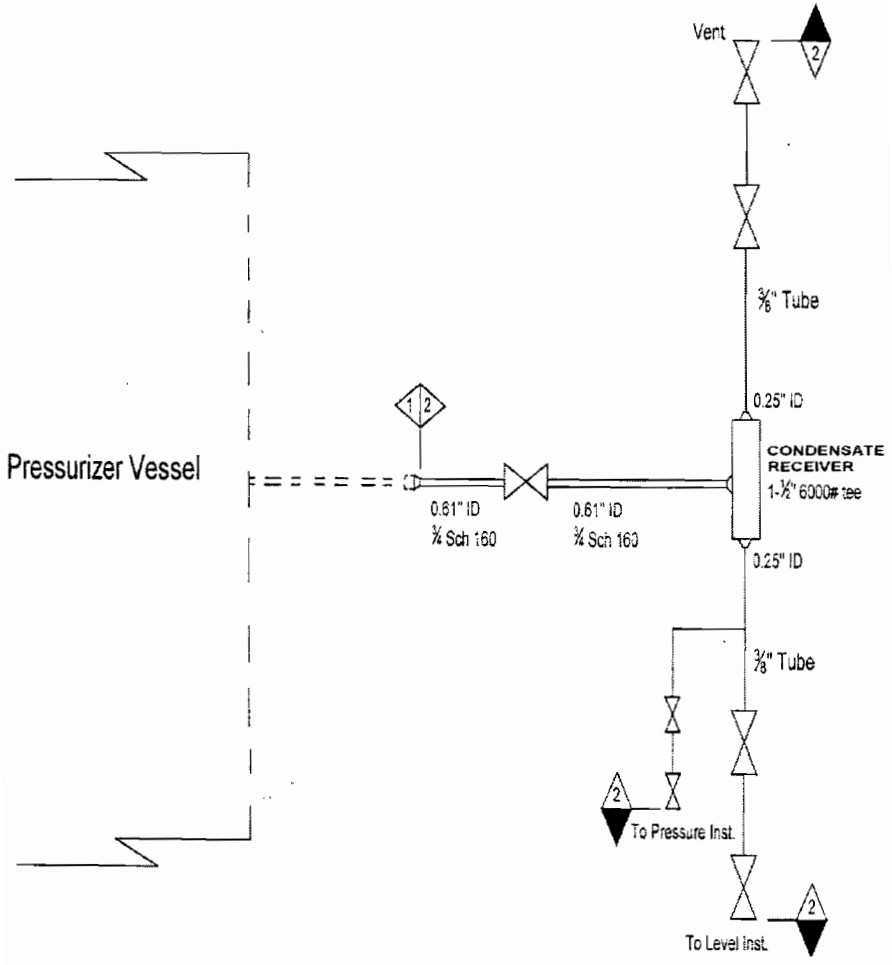
Westinghouse Nuclear Safety Advisory Letter (NSAL-07-9, Revision 1), "Safety Classification of Small Lines Connected to the Pressurizer Steam Space," dated August 11, 2008.

Status: Awaiting NRC approval.

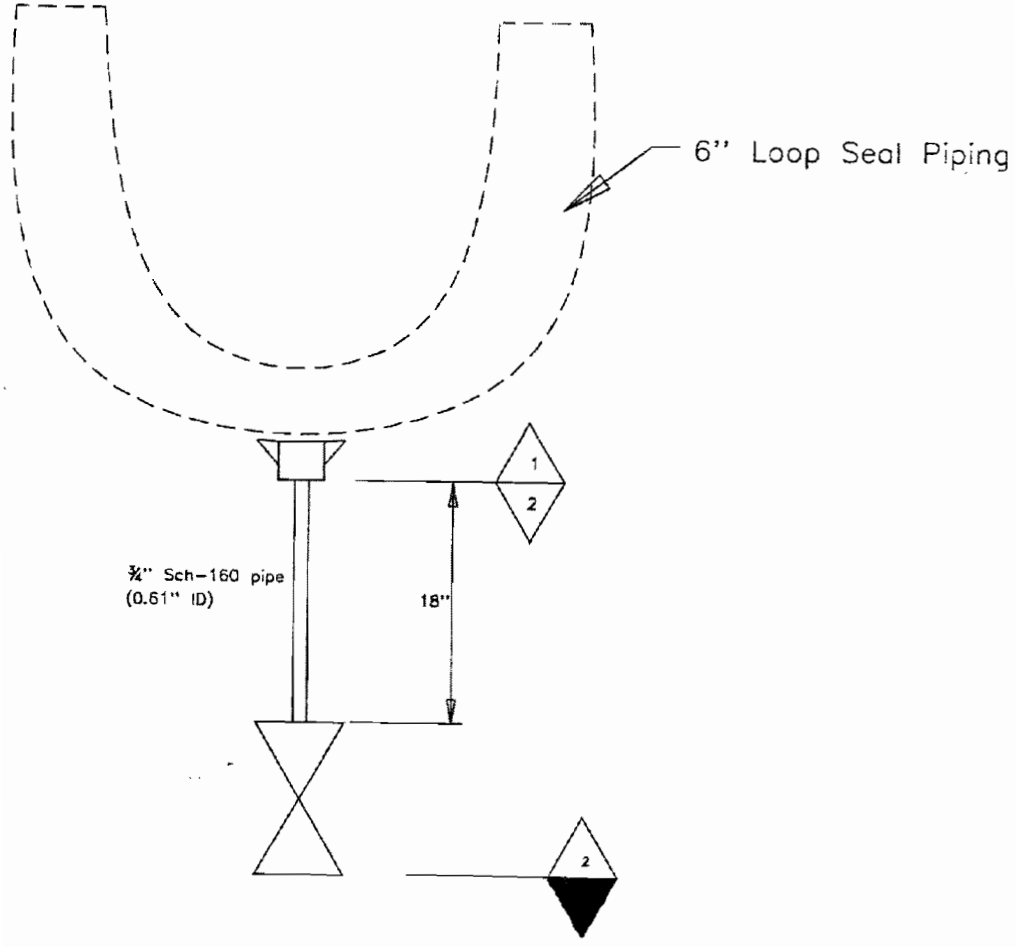
Table 1 **Farley Unit 1 Small Diameter Lines in the Pressurizer Steam Space**			
Pressurizer Upper Level Instrumentation Lines			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-38 (3 places)	D-175037, Sh. 2	F-3 thru F-5	Q1B13-V032 Q1B13-V033A & B
3/8-inch-Tubing (3 places)	NA	NA	Multiple Mark J-200 Valves
Pressurizer Safety Loop Seal Drain Lines			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-39 (3 places)	D-175037, Sh. 2	D-3 thru D-5	Q1B31-V030A, B, and C
Pressurizer Sample and Vent Lines			
Line(s)	**P&ID**	**Location**	**Valves**
3/8-inch-Tubing (1 place)	D-175009, Sh. 2	F-1 thru F-4	Q1P15-V040A Q1P15-V040C Q1P15-SV3104 Q1P15-SV3331
3/4-inch CCB-54 (1 place)	D-175037, Sh. 2	E-2 thru C-2	Q1B13-V029 Q1B13-V028A
Pressurizer Spray Valve Bypass Line			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-57 (2 places)	D-175037, Sh. 2	E-7 thru G-7	Q1B13-V055 Q1B13-V059

Table 2 **Farley Unit 2 Small Diameter Lines in the Pressurizer Steam Space**			
Pressurizer Upper Level Instrumentation Lines			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-38 (3 places)	D-205037, Sh. 2	F-3 thru F-5	Q2B13-V032 Q2B13-V033A & B
3/8-inch-Tubing (3 places)	NA	NA	Multiple Mark J-200 Valves
Pressurizer Safety Loop Seal Drain Lines			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-39 (3 places)	D-205037, Sh. 2	D-3 thru D-5	Q2B31-V030A, B, and C
Pressurizer Sample and Vent Lines			
Line(s)	**P&ID**	**Location**	**Valves**
3/8-inch-Tubing (1 place)	D-205009, Sh. 2	F-1 thru F-4	Q2P15-V040A Q2P15-V040C Q2P15-SV3104 Q2P15-SV3331
3/4-inch CCB-54 (1 place)	D-205037, Sh. 2	E-2 thru C-2	Q2B13-V029 Q2B13-V028
Pressurizer Spray Valve Bypass Line			
Line(s)	**P&ID**	**Location**	**Valves**
¾-inch-CCB-57 (2 places)	D-205037, Sh. 2	E-7 thru G-7	Q2B13-V055 Q2B13-V059

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)

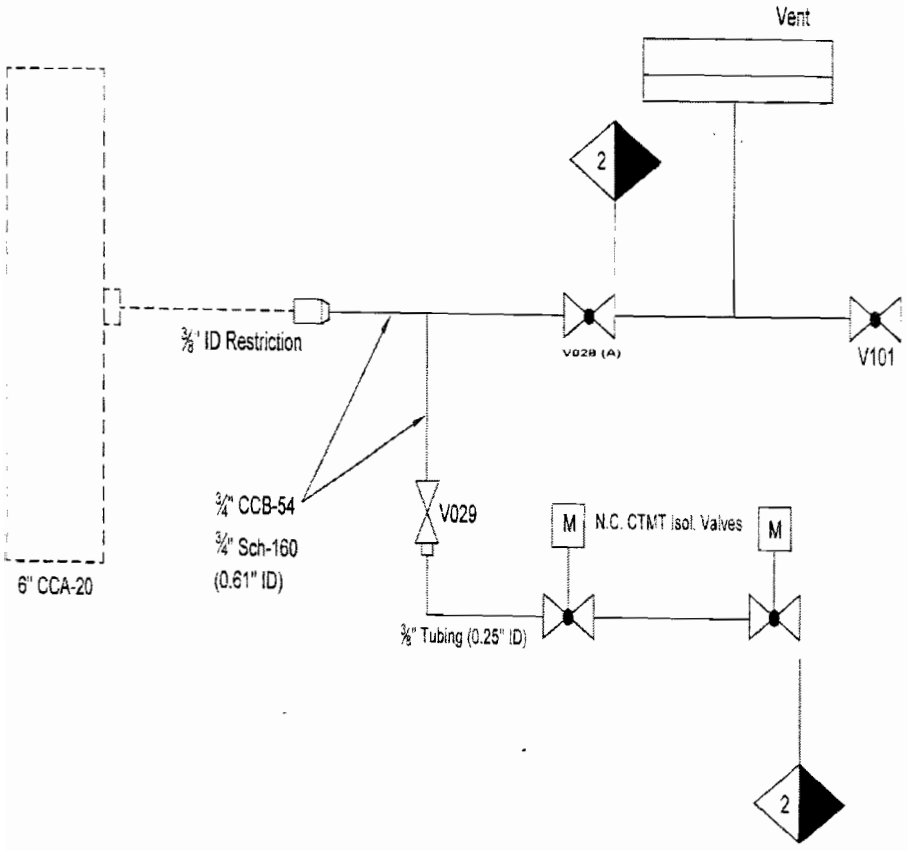


ATTACHMENT 1
Farley Pressurizer Upper Level Instrumentation Lines

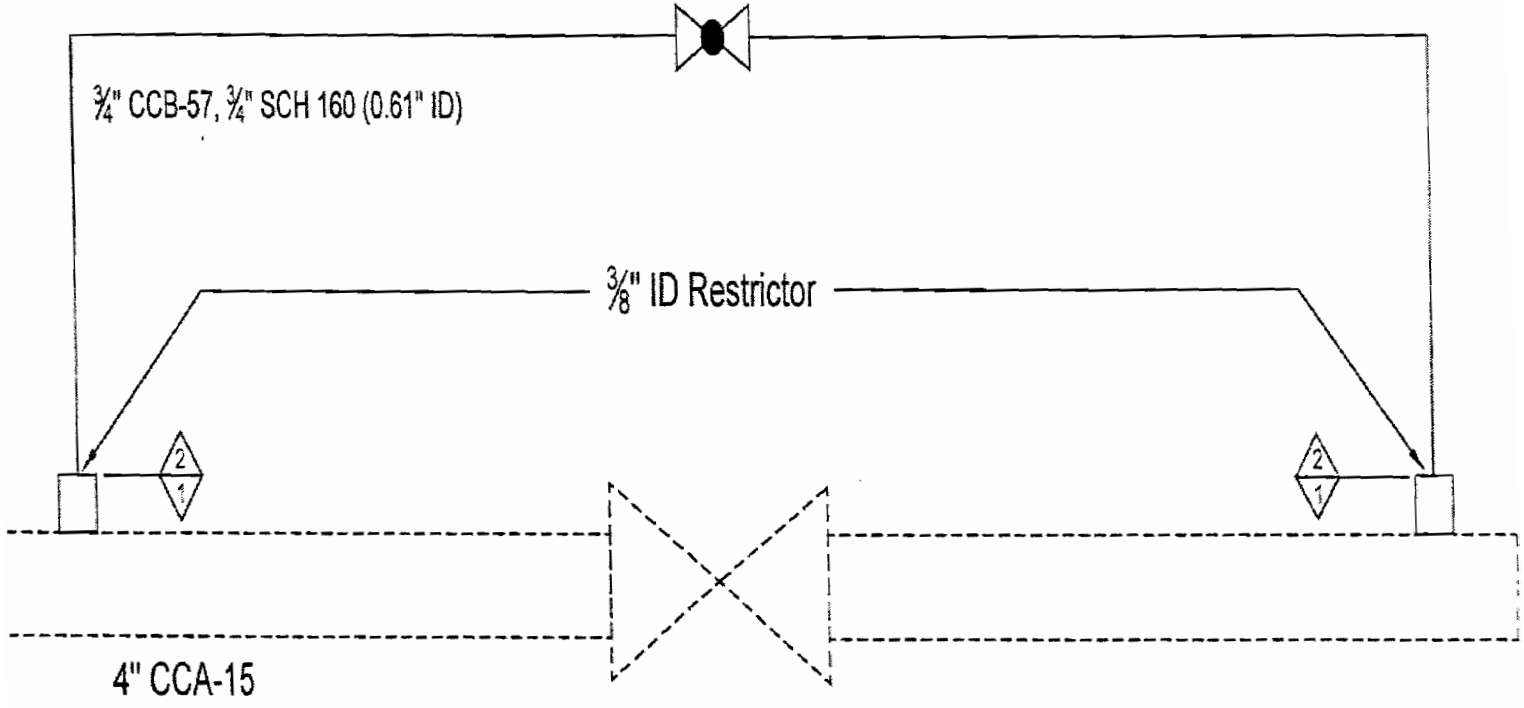


ATTACHMENT 2
Farley Pressurizer Safety Loop Seal Drain Lines

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)

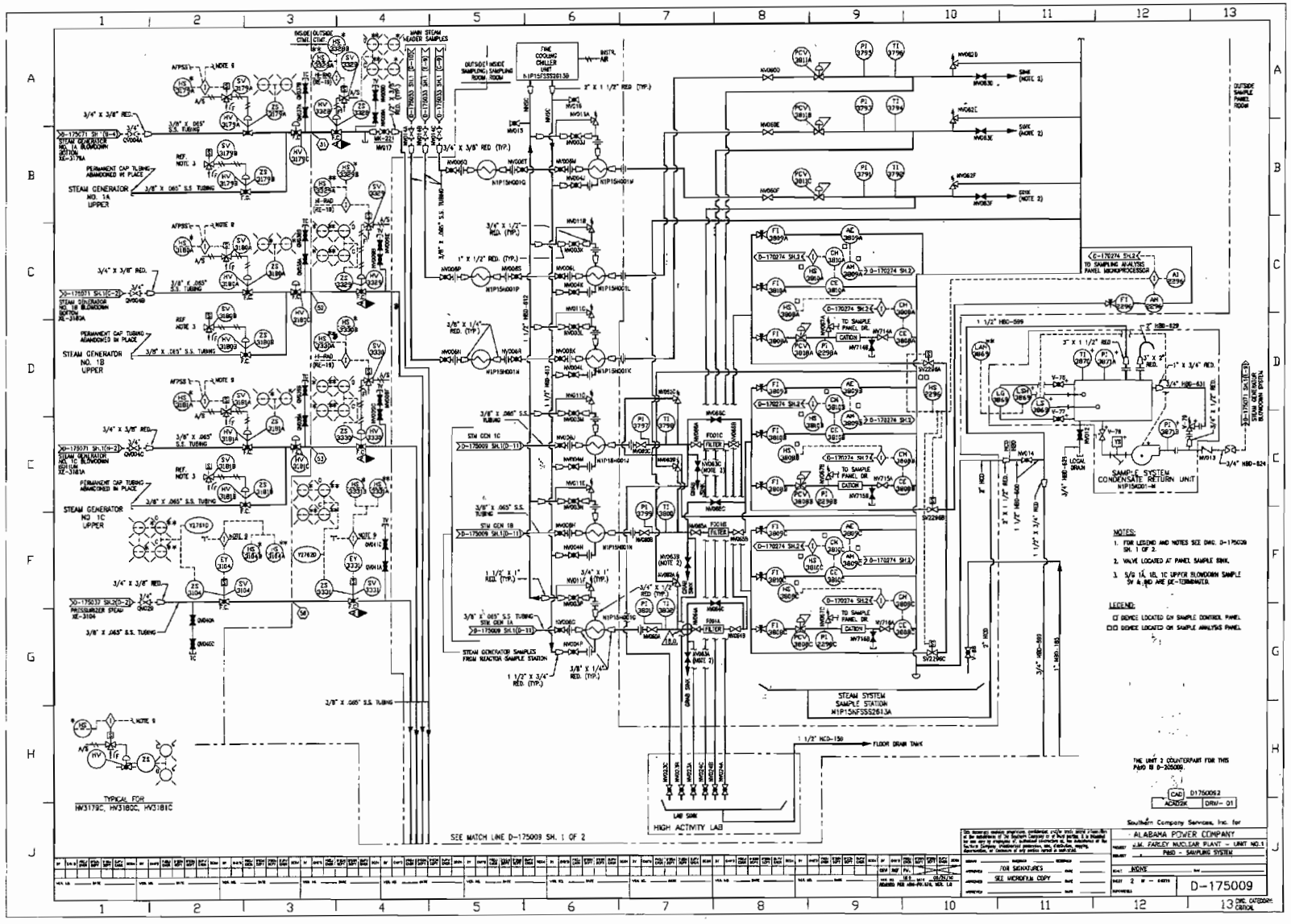


ATTACHMENT 3
Farley Pressurizer Sample and Vent Lines



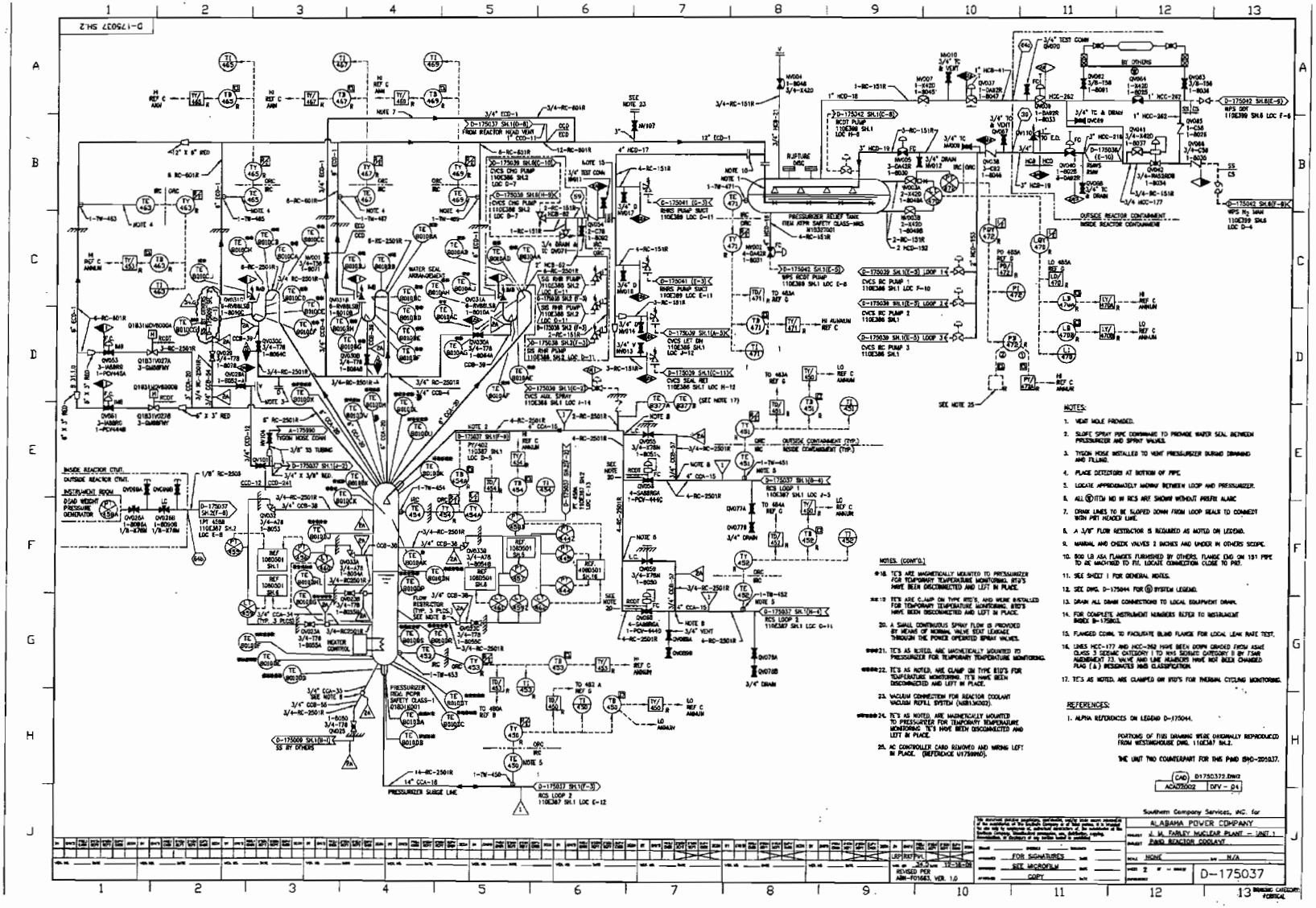
ATTACHMENT 4
Farley Pressurizer Spray Valve Bypass Lines

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)



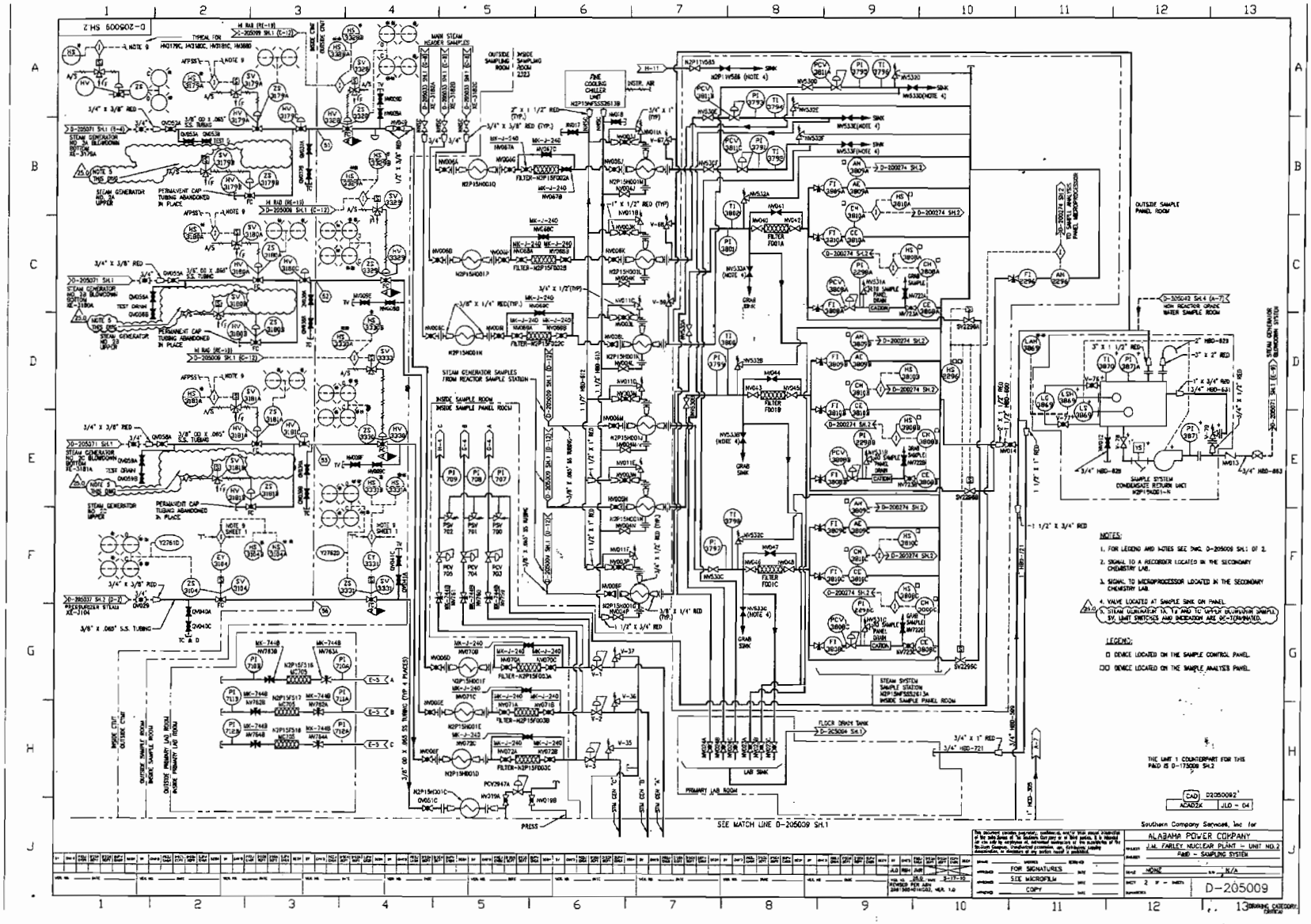
ATTACHMENT 5
Farley Unit 1 P&ID D-175009, Sheet 2

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)



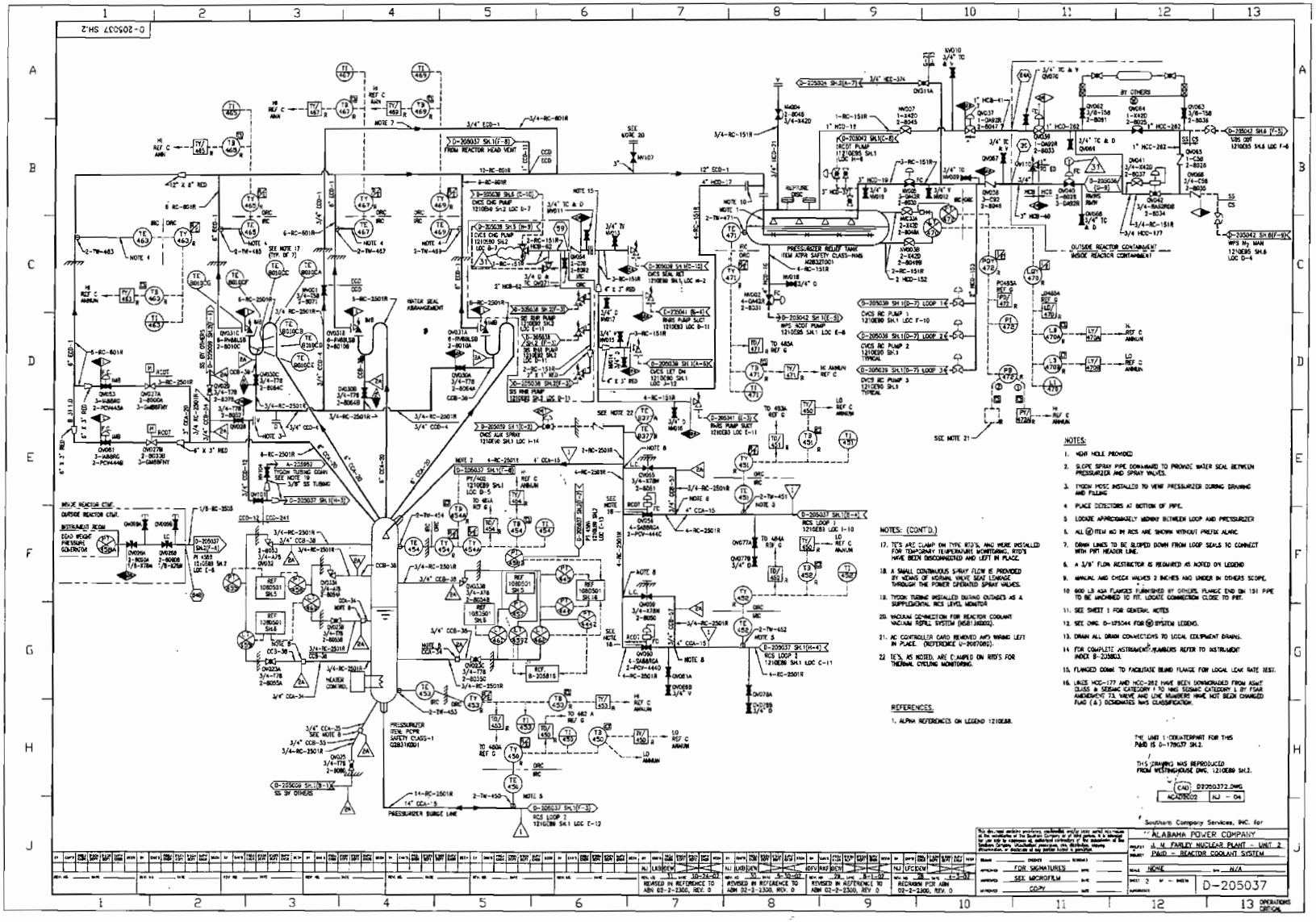
ATTACHMENT 6
Farley Unit 1 P&ID D-175037, Sheet 2

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)



ATTACHMENT 7
Farley Unit 2 P&ID D-205009, Sheet 2

Enclosure
Proposed Alternative FNP-ISI-ALT-11, Version 1.0
in Accordance with 10 CFR 50.55a(a)(3)(ii)



ATTACHMENT 8
Farley Unit 2 P&ID D-205037, Sheet 2