ATTACHMENT A

1. System Description

The Continuous Containment Purge/Hydrogen Purge System was designed and installed to:

a) provide a sufficiently low concentration of radionuclides in the containment atmosphere to allow access into the containment by plant personnel for inspection and maintenance,

b) ensure that the containment source term contribution to the annual average offsite doses is maintained as low as is reasonably achievable,

c) provide a means for relieving containment pressure buildup, and

d) provide a means for venting hydrogen in the event of an accident.

The system consists in part of two 8-inch lines penetrating containment with isolation valves inside and outside containment (Figure 1). One line provides makeup air to the containment, with air flowing through a butterfly valve, the containment penetration, and a check valve before entering the containment atmosphere. A debris screen at the outlet of the check valve prevents foreign matter from clogging the check valve and preventing its operation.

Flow from the exhaust line goes through an inlet bell and debris screen, a butterfly valve, the containment penetration, another butterfly valve, an air cleaning unit, redundant 100 percent capacity centrifugal exhaust fans and up the plant stack. Interlocks in the system prevent flow from the containment atmosphere from being released without being processed by either the Continuous Purge System air cleaning unit or by the Shield Building Ventilation System (SBVS) air cleaning units.

The air cleaning unit for the Continuous Containment Purge System consists of, in series; a demister, electric heating coil, medium efficiency filter, high efficiency particulate adsorber (HEPA) filter, charcoal adsorber, and a second HEPA filter. This system will remove particulates and iodine from the process stream.

The Continuous Purge System is non-safety with the exception of the containment isolation portion, which has been built seismic, safety Class II in compliance with General Design Criteria (GDC) 54.

II. Evaluation Against NRC Requirements

The following demonstrates, point by point, how the design of the St. Lucie 2 Continuous Containment/Hydrogen Purge System meets the requirements of NRC's Containment Systems Branch Technical Position CSB 6-4. "Containment Purging During Normal Plant Operations" Revision 2:

Branch Position

B.1.a General Design Criterion 54 requires that the reliability and performance capabilities of containment isolation valves reflect the importance of safety of isolating the systems penetrating the containment boundary. Therefore, the performance and reliability of the purge system isolation valves should be consistent with the operability assurance program outlined in Branch Technical Position MEB-2, "Pump and Valve Operability Assurance Program." (Also see SRP Section 3.10.) The design basis for the valves and actuators should include the buildup of the containment pressure for the LOCA break spectrum, and the supply line and exhaust line flows as a function of time up to and during valve closure.

FPL Compliance

The valves and actuators that provide containment isolation for the Continuous Containment/H_2 Purge System are designed seismic, safety Class II. Three of the four valves used are 8-inch butterfly valves with spring return pneumatic actuators which fail close on a loss of instrument air. These valves are required to be capable of closing within 3 seconds upon receipt of an isolation signal by the plant technical specifications. The remaining isolation valve is an 8-inch check valve that provides isolation inside containment for the makeup portion of the Continuous Purge System. All of these valves have been shown to be qualified to close against peak containment pressure (44 psig) by NRC accepted methodology. A detailed discussion of this methodology is provided in Supplement 2 to the Safety Evaluation Report (SER), NUREG-0843, Section 22.

Branch Position

B.1.b The number of supply and exhaust lines that may be used should be limited to one supply line and one exhaust line, to improve the reliability of the isolation function as required by General Design Criterion 54, and to facilitate compliance with the requirements of Appendix K to 10 CFR Part 50 regarding the containment pressure used in the evaluation of the emergency core cooling system effectiveness and 10 CFR Part 100 regarding offsite radiological consequences.

FPL Compliance

The Continuous Containment/H_2 Purge System is provided with one supply line and one exhaust line in compliance with the Branch Position.

Branch Position

B.1.c The size of the lines should not exceed about eight inches in diameter, unless detailed justification for larger line sizes is provided, to improve the reliability and performance capability of the isolation and containment functions as required by General Design Criterion 54, and to facilitate compliance with the requirements of Appendix K to 10 CFR Part 50 regarding the containment pressure used in evaluating the emergency core cooling system effectiveness and 10 CFR Part 100 regarding the offsite radiological consequences.

FPL Compliance

The Continuous Containment/H_2 Purge System is designed using eight inch lines in compliance with the Branch Technical Position.

Branch Position

B.1.d As required by General Design Criterion 54, the containment isolation provisions for the purge system lines should meet the standards appropriate to engineered safety features; i.e., quality, redundancy, testability and other appropriate criteria, to reflect the importance to safety isolating these lines. General Design Criterion 56 establishes explicit requirements for isolation barriers in purge system lines.

FPL Compliance

The containment isolation portion of the Continuous Containment Purge System is designed seismic, safety class II in accordance with ASME Section III. A single failure associated with this system will not prevent the isolation function from being performed, therefore the requirement for redundancy is met. The testing provisions for this system presently require the plant to be shutdown to leak test the isolation valves. The St. Lucie 2 license is conditioned to provide on-line testing capability of these valves by the first refueling outage.

Branch Position

B.1.e To improve the reliability of the isolation function, which is addressed in General Design Criterion 54, instrumentation and control systems provided to isolate the purge system lines should be independent and actuated by diverse parameters; e.g., containment pressure, safety injection actuation, and containment radiation level. Furthermore, if energy is required to close the valves, at least two diverse sources of energy shall be provided, either of which can effect the isolation function.

FPL Compliance

The Continuous Containment/Hydrogen Purge System containment isolation valves are actuated by a Containment Isolation Action Signal (CIAS). CIAS is initiated by a Safety Injection Actuation Signal (SIAS), high containment pressure, and high containment radiation in accordance with the Branch Position. Further, the CIAS signal is supplied by separate electrical trains in such a manner that a single failure will not prevent the isolation function from being accomplished. Finally, the valves are closed by the force stored in a compressed spring. Failure of either control power or air supply to the valve actuator will cause the valve to fail in the closed (safe) position.

Branch Position

B.1.f Purge system isolation valve closure times, including instrumentation delays, should not exceed five seconds, to facilitate compliance with 10 CFR Part 100 regarding offsite radiological consequences.

FPL Compliance

The eight inch containment purge valves are required by the plant Technical Specifications to close within 3 seconds upon receipt of a CIAS, which complies with the Branch Position.

Branch Position

B.1.g Provisions should be made to ensure that isolation valve closure will not be prevented by debris which could potentially become entrained in the escaping air and steam.

FPL Compliance

Debris screens are provided at the inlet bell of the exhaust line of the Continuous Purge System and at the exhaust of the makeup line of the eight inch containment purge system, in compliance with the Branch Position.

Branch Position

B.2 The purge system should not be relied on for temperature and humidity control within the containment.

FPL Compliance

A separate system is provided for temperature and humidity control inside containment in compliance with the Branch Position.

Branch Position

B.3 Provisions should be made to minimize the need for purging of the containment by providing containment atmosphere cleanup systems within the containment.

FPL Compliance

While a containment atmosphere cleanup system is not provided inside the containment, FPL provides a containment cleanup system as described below.

The primary radioisotopes in the containment atmosphere are noble gases and radioiodines. In addition, other contaminants may be associated with dust in the containment atmosphere. While cleanup of noble gases is not feasible except by decay, HEPA filters and charcoal adsorbers provide a highly effective means of removing dust and radioiodines from containment atmosphere. Such a clean up system is provided as part of the continuous containment purge system outside containment. The advantages to having an air cleanup system outside containment are: 1) Cleanup of the containment atmosphere by once through flow is more effective and 2) changeout of the air filters and charcoal adsorbing medium is more readily performed by operating personnel with lower attendent doses outside containment.

FPL believes that the design of the Continuous Containment Purge System meets the requirements of the Branch Position in this area.

Branch Position
B.4 Provisions should be made for testing the availability of the isolation function and the leakage rate of the isolation valves during reactor operation.

FPL Compliance

Capability to test the isolation function of the Continuous Containment Purge System containment isolation valves (i.e., time their closure) exists during power operation. Testing of these valves is required after valve maintenance or at least every refueling outage by the Technical Specification.

Provisions for leak testing these valves during power operation will be installed during the first refueling outage at St. Lucie 2. Presently, these valves are leak tested prior to entering Mode 4 from Cold Shutdown if not previously tested within 31 days.

Accordingly, FPL complies with the requirements of the Branch Position.

Branch Position
B.5.a Perform analysis of the radiological consequences of a loss-of-coolant accident. The analysis should be done for a spectrum of break sizes, and the instrumentation and setpoints that will actuate the purge valves closed should be identified. The source term used in the radiological calculations should be based on a calculation under the terms of Appendix K to determine the extent of fuel failure and the concomitant release of fission products, and the fission product activity in the primary coolant. A pre-existing iodine spike should be considered in determining primary coolant activity. The volume of containment in which fission products are mixed should be justified, and the fission products from the above sources should be justified, and the fission products from the above sources should be assumed to be released through the open purge valves during the maximum interval required for valve closure. The radiological consequences should be within 10 CFR Part 100 guideline valves.

FPL Compliance

An analysis performed to determine post LOCA offsite doses at the low population zone for an eight inch exhaust line and five second isolation valve closure showed that the dose guidelines of 10 CFR part 100 will not be exceeded.

Branch Position

B.5.b An analysis which demonstrates the acceptability of the provisions made to protect structures and safety-related equipment; e.g., fans, filters, and ductwork, located beyond the purge system isolation valves against loss of function from the environment created by the escaping air and steam.

FPL Compliance

The portion of the Continuous Containment/Hydrogen Purge System located beyond the purge system containment isolation valves is non-safety related with a design pressure of 5 psig and a design temperature of 200°F. The ductwork is fabricated from a schedule 40 piping, and is therefore capable of withstanding pressures in excess to those created by a LOCA. Closure of the purge system isolation valves within 5 seconds provides assurance that these non-safety components will be protected from over pressurization caused by escaping air and steam during a LOCA.

Branch Position

B.5.c Perform an analysis of the reduction in the containment pressure resulting from the partial loss of containment atmosphere during the accident for ECCS backpressure determination.

FPL Compliance

For the ECCS backpressure determination of a worst case LOCA, assumptions are made to minimize containment pressure. By minimizing containment pressure, the greatest flow can be obtained for an RCS line break and the effects of the LOCA are therefore maximized. For the ECCS backpressure determination at St. Lucie 2, it was assumed that the eight inch continuous containment purge system is operating at the time of the postulated LOCA. . The purge system isolation valves are assumed to be fully closed 5.0 seconds after a containment isolation actuation signal was generated by high containment pressure (6.0 psig). It is conservatively assumed that only dry air is removed from the containment atmosphere. These assumptions minimize containment backpressure and therefore this analysis meets the requirements of the Branch Position.

Branch Position

B.5.d The maximum allowable leak rate of the purge isolation valves should be specified on a case-by-case basis giving appropriate consideration to valve size, maximum allowable leakage rate for the containment (as defined in Appendix J to 10 CFR Part 50), and where appropriate, the maximum allowable bypass leakage fraction for dual containments.

FPL Compliance

Maximum allowable leakage rate for the purge isolation is less than or equal to 0.05 L_a (L_a is maximum allowable leakage rate) when pressurized to P_a (calculated peak internal containment pressure) as required by the Technical Specifications. A leakage limit of 0.60 L_a shall not be exceeded when the leakage rates determined by the leakage integrity tests of these purge valves are added to the leakage total determined for all valves and penetrations subject to Type B and C tests. This is in accordance with the requirements of Appendix J to 10 CFR 50. Accordingly, FPL complies with the requirements of the Branch Position.

III. Justification for Continuous Operation

Based on the above comparison with the Branch Technical Position CSB 6-4, the design of the St. Lucie 2 Continuous Containment Purge System meets all the requirements of the Branch Position. In addition the present requirement that limits operation of the Continuous Containment Purge System was imposed without an apparent technical basis being provided.

The limitation of 1000 hours per year on containment purging has caused a buildup of noble gases and Iodine-131 in the containment atmosphere. An ALARA concern presently exists for those personnel who must enter containment to make normal inspections. Further, the desire to do additional inspections other than the minimum required is restricted by the high noble gas and iodine levels being experienced inside containment. Presently, I-131 concentrations are about 2½ times the Maximum Permissible Concentration (MPC) allowed inside containment. This corresponds to a maximum working time for an individual in containment of 16 hours over a 7 day period.

Concentrations of Xe-133 are about 39 times MPC. Both Xe-135 and Ar-41 are about twice MPC. At these concentrations, an operator's work inside containment is limited to a maximum of 1 hour every 7 day period.

Accordingly, since this system meets all the necessary criteria, it is requested that the license be amended to allow continuous operation of the eight inch containment purge system.

CONTAINMENT SYSTEMS

CONTAINMENT VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.6.1.7 Each containment purge supply and exhaust isolation valve shall be OPERABLE and:

a. Each 48-inch containment purge supply and exhaust isolation valve shall be sealed closed.

~~b. The 8-inch containment purge supply and exhaust isolation valves may be open for less than or equal to 1000 hours per calendar year.~~

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With a 48-inch containment purge supply and/or exhaust isolation valve(s) open or not sealed closed, close and/or seal close the open valve(s) or isolate the penetration(s) within 4 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

~~b. With an 8-inch containment purge supply and/or exhaust isolation valve(s) open for more than 1000 hours per calendar year, close the open 8-inch valve(s) or isolate the penetration(s) within 4 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.~~

b, c. With a containment purge supply and/or exhaust isolation valve(s) having a measured leakage rate exceeding the limits of Surveillance Requirements 4.6.1.7.3 and/or 4.6.1.7.4, restore the inoperable valve(s) to OPERABLE status within 24 hours, otherwise be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.6.1.7.1 Each 48-inch containment purge supply and exhaust isolation valve shall be verified to be sealed-closed at least once per 31 days.

~~4.6.1.7.2 The cumulative time that the 8-inch purge supply or exhaust isolation valves are open during the past calendar year shall be determined at least once per 7 days.~~

4.6.1.7.2 At least once per 6 months on a STAGGERED TEST BASIS each sealed closed 48-inch containment purge supply and exhaust isolation valve with resilient material seals shall be demonstrated OPERABLE by verifying that the measured leakage rate is less than or equal to 0.05 L_a when pressurized to P_a.

4.6.1.7.3 Each 8-inch containment purge supply and exhaust isolation valve with resilient material seals shall be demonstrated OPERABLE by verifying that the measured leakage rate is less than or equal to 0.05 L_a when pressurized to P_a prior to entering MODE 4 from COLD SHUTDOWN if not tested within the previous 31 days.

ATTACHMENT C

No Significant Hazards Consideration

Florida Power and Light Company (FPL) presents this evaluation of the hazards considerations involved with the proposed amendment, focusing on the three standards set forth in 10CFR50.92(c) as quoted below:

> The Commission may make a final determination, pursuant to the procedures in 50.91, that a proposed amendment to an operating license for a facility licensed under 50.21(b) or 50.22 or for a testing facility involves no significant hazards considerations, if operation of the facility in accordance with a proposed amendment would not:
>
> 1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or
>
> 2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or
>
> 3. Involve a significant reduction in a margin of safety.

FP&L submits that the activities associated with this amendment request do not meet any of the significant hazards consideration standards of 10CFR50.92(c) and, accordingly, a no significant hazards consideration finding is justified. In support of this determination, necessary background information has been provided (Attachment A). Discussion of each of the above three significant safety hazards

consideration standards follows.

Evaluation

The following evaluation demonstrates that the proposed amendment does not exceed any of the three significant hazards consideration standards.

1. Involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed Technical Specification will allow continuous operation of the 8 inch containment purge system. This represents an increase in operating time from 1000 hours to 8760 hours per year. Continuous operation of this system will not increase the probability of an accident since this system cannot in itself cause an accident. This system does serve to mitigate the consequences of a potential release to the public following a Loss of Coolant Accident (LOCA). In the evaluation of these isolation valves, they were assumed to be open when a LOCA occurred. These valves are designed to close within 5 seconds of the start of a containment Isolation Actuation Signal (CIAS).

This meets with NRC Branch Technical Position CSB 6-4. Further, this system has been designed to accomodate a single failure. In the event of an accident, offsite doses will not exceed the limits specified in 10CFR100.

2. Create the possibility of a new or different kind of accident from any accident previously evaluated.

The proposed Technical Specification will allow the 8 inch purge valves to remain open continuously. Extending the number of allowable purge hours per year does not involve any evolution which is not currently performed.

3. Involve a significant reduction in a margin of safety.

The Continuous Containment/Hydrogen Purge System has been designed for continuous operation. In the event of a LOCA, with a failure of a single 8 inch purge valve, the remaining valves will close within 5 seconds. Offsite doses due to a LOCA and one 8-inch purge valve failure will not exceed 10CFR100 limits. Extending the number of allowable purge hours per year does not place the plant in a different configuration than that which is currently utilized routinely. Therefore, continuous operation of the 8-inch purge system does not involve a significant reduction in a margin of safety.

48 FR 14870 dated April 6, 1983 provided examples of amendments not likely to involve a significant hazards consideration. This proposed change is considered to be most similar to example (iv) in that it involves relief from an operating restriction which was imposed prior to licensing because justification for the relief based on plant operating experience did not exist at that time.

In summation, it has been shown that the Technical Specification change would not:

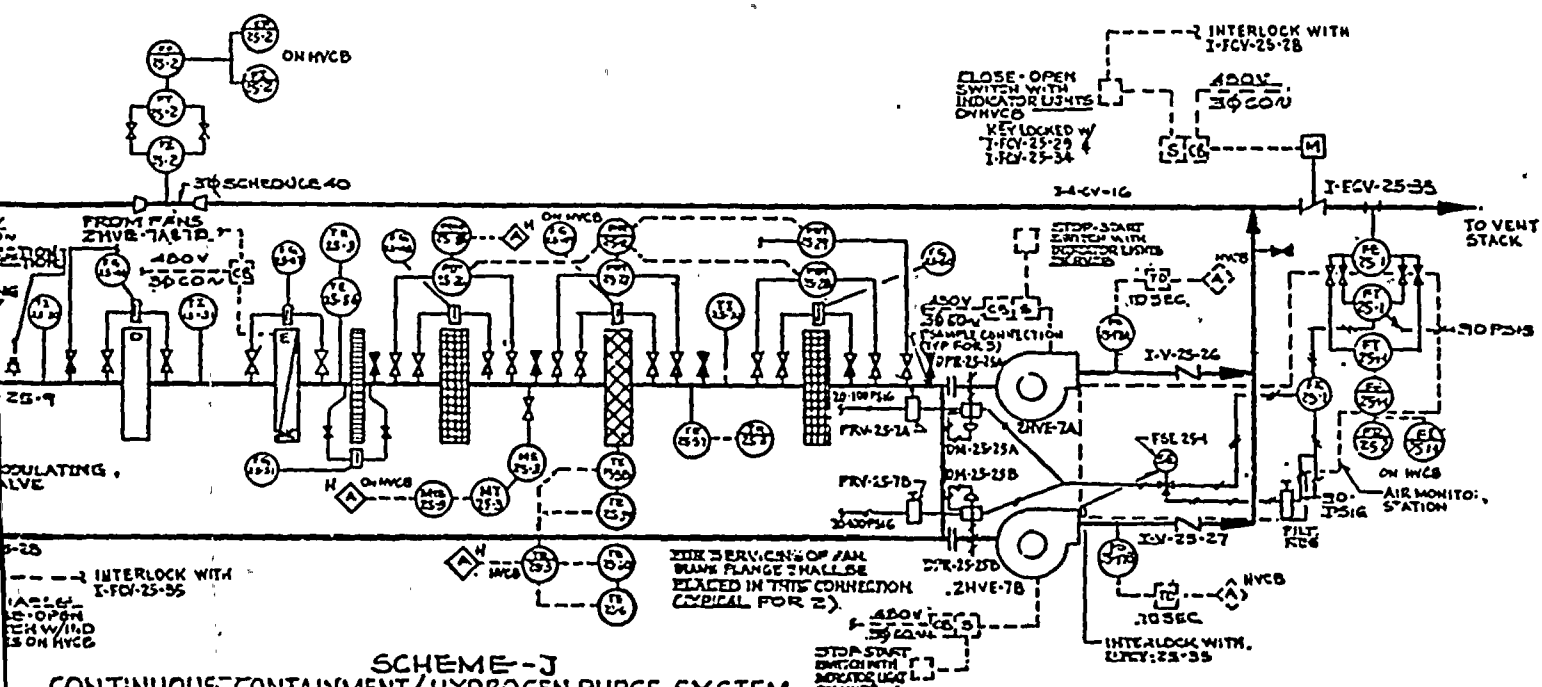
1. Involve a significant increase in the probability or consequences of an accident previously evaluated; or

2. Create the possibility of a new or different kind of accident from any accident previously evaluated; or

3. Involve a significant reduction in a margin of safety.

Therefore, FP&L has determined that the proposed amendment involves no significant hazards considerations.

Also Available On
Aperture Card



SCHEME-J
CONTINUOUS CONTAINMENT/HYDROGEN PURGE SYSTEM

TI
APERTURE
CARD

AMENDMENT NO. 14 (11/83)

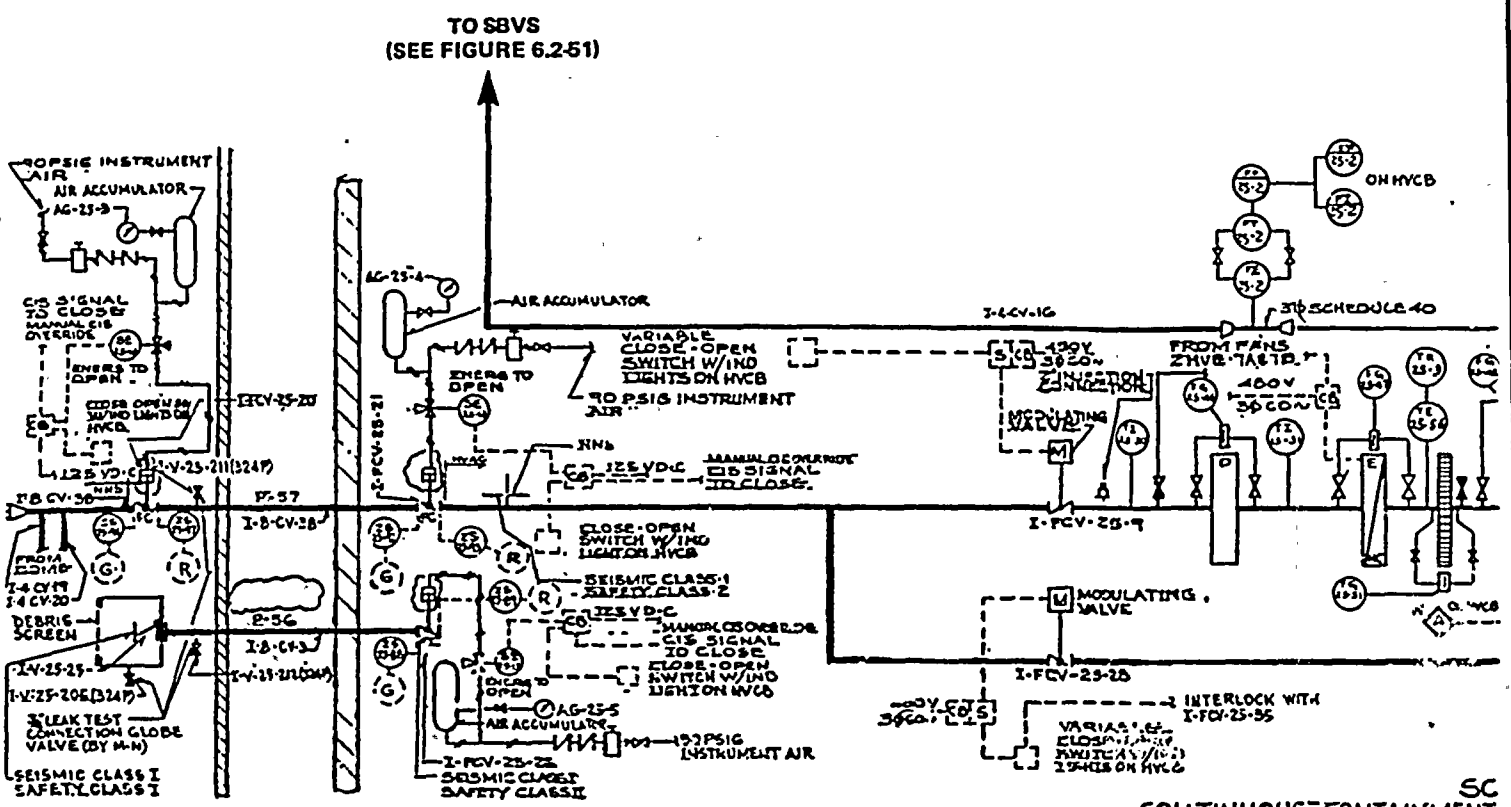
FLORIDA POWER & LIGHT COMPANY
ST. LUCIE PLANT UNIT 2

CONTINUOUS CONTAINMENT/HYDROGEN PURGE SYSTEM – P&ID

FIGURE 1

REF DWG: PART OF 2998-G-879 SO 3 (REV 10, OPEN)

8409070002-D1


TO SBVS
(SEE FIGURE 6.2-51)
90PSIG INSTRUMENT AIR
AIR ACCUMULATOR
AC-25-3
C/S SIGNAL TO CLOSE
MANUAL S/B OVERRIDE
ENERG TO OPEN
CLOSE OPEN W/IND LIGHTS ON HVCB
I-V-25-211(324F)
125 VD-C
NNB
I-B-CV-30
I-B-CV-28
FROM CONTMT I-4 CV-19 I-4 CV-20
DEBRIS SCREEN
I-V-25-206(324F)
LEAK TEST CONNECTION GLOBE VALVE (BY M-N)
SEISMIC CLASS I SAFETY CLASS I
AC-25-4
AIR ACCUMULATOR
VARIABLE CLOSE-OPEN SWITCH W/IND LIGHTS ON HVCB
90 PSIG INSTRUMENT AIR
I-FCV-25-21
HVAC
125 VD-C
MANUAL OVERRIDE TO SIGNAL TO CLOSE
CLOSE-OPEN SWITCH W/IND LIGHT ON HVCB
SEISMIC CLASS I - SAFETY CLASS 2
125 VD-C
MANUAL OVERRIDE
C/S SIGNAL TO CLOSE
CLOSE-OPEN SWITCH W/IND LIGHT ON HVCB
ENERG TO OPEN
AC-25-5
AIR ACCUMULATOR
150 PSIG INSTRUMENT AIR
I-FCV-25-22
SEISMIC CLASS I SAFETY CLASS II
I-FCV-25-9
MODULATING VALVE
I-FCV-25-28
MODULATING VALVE
INTERLOCK WITH I-FCV-25-35
VARIABLE CLOSE-OPEN SWITCH W/IND LIGHTS ON HVCB
I-FCV-25-10
3" SCHEDULE 40
FROM FANS ZHVB-7A&7B
480V 3Ø60~
480V 3Ø60~
ON HVCB
SC
CONTINUOUS CONTAINMENT