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August 2, 1984

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Limerick Generating Station
Response to Procedures and Systems Review
Branch (PSRB) Questions

References: a) J. S. Kemper (PECo) letter to A. Schwencer (NRC) dated June 15, 1984
b) PECo/NRC Staff Meeting on July 2[illegible], 1984

Dear Mr. Schwencer:

Our reference a) response to PSRB questions regarding Limerick emergency procedures is hereby revised to include additional information discussed at the reference b) meeting.

Very truly yours,

J W Gallagher
for
J. S. Kemper

DRH/cmv/07258406

Attachment

Copy to: See Attached Service List

B001
1/1

cc: Judge Lawrence Brenner (w/enclosure)
Judge Richard F. Cole (w/enclosure)
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Ann P. Hodgdon, Esq. (w/enclosure)
Mr. Frank R. Romano (w/enclosure)
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Atomic Safety & Licensing Board Panel (w/enclosure)
Docket & Service Section (w/enclosure)
Martha W. Bush, Esq. (w/enclosure)
Mr. James Wiggins (w/enclosure)
Mr. Timothy R. S. Campbell (w/enclosure)
Ms. Phyllis Zitzer (w/enclosure)
Judge Peter A. Morris (w/enclosure)

Selection of LGS Containment Vent Pressure

The BWR Owners Group (BWROG) has developed symptom based Emergency Procedure Guidelines (EPG's) in response to NRC TMI Lessons Learned requirements (NUREG-0737, Item I.C.1). The EPG's provide a generic framework for the development of plant unique Emergency Operating Procedures (EOP's). Since they are symptom based, the EPG's and EOP's do not pertain to any specific event but, rather, provide operator guidance for all plant situations whether or not they are beyond the plant's design basis.

The EPG's call for venting of the primary containment at the primary containment pressure limit. In all situations where this step is taken the plant will be significantly beyond its design basis. This procedural step has been described to the NRC and approved on a generic basis (see F. B. Litton (NRC) memo for K. Kniel (NRC) dated May 10, 1984 and D. G. Eisenhut (NRC) letter to BWROG dated February 4, 1983). Determination of a suitable primary containment pressure limit requires plant unique evaluation.

A pressure of 70 psig has been selected for use as the containment pressure limit in the Limerick emergency procedures. Venting of the primary containment will be initiated at this pressure using the following vent paths in the indicated order of preference:

- 2" Suppression Pool Vent to SGTS
- 2" Drywell Vent to SGTS
- 6" ILRT Line from Supp. Pool
- 18" Supp. Pool Purge
- 24" Supp. Pool Supply
- 4" Drywell Sump Drain Lines (2)
- 24" Drywell Purge
- 24" Drywell Supply
- 6" ILRT Line from Drywell

The indicated containment pressure limit and the ranking of vent paths has been based on consideration of a number of interrelated issues:

- This pressure (1.3 times design), is somewhat greater than the Structural Integrity Test pressure (1.15 times design). Structural deformations are not expected to be substantially different than those observed during the structural integrity test and margin will exist to containment ultimate structural capability. Venting will minimize the potential for indeterminant containment failure modes and uncontrolled releases of containment atmosphere which would accompany a structural failure.

- The isolation valves in the above vent paths have been determined to be operable (i.e. - for opening and closure) for differential pressures ranging from 76 psid to over 150 psid. The evaluation of valve operability has included consideration of all relevant loads, including flow induced dynamic effects. Valve performance characteristics have been derived from analysis and test results. Those valves with the lowest differential pressure capability, the 18" and 24" valves, are all oriented such that containment pressure resists valve opening, or assists valve closure. The operability of these valves is limited by the actuator torque available for opening. Thus, valve reclosure would be assisted by containment pressurization. Initiation of the venting sequence at the selected pressure limit will assure that venting is not begun before conditions warrant and that the vent valves will be used before pressures challenging their operability are reached. The differential pressure rating and size of each vent path is indicated on the attached sketch.

- Each of the indicated containment vent paths has differing levels of desirability with regard to fission product retention, potential for causing adverse reactor enclosure environmental effects, and potential for equipment damage. It has been judged to be preferable to favor avoidance of potentially adverse reactor building environmental conditions over the dose reduction benefit that would be received from plateout, dilution, and delay in the reactor building for almost all situations. This judgement is based on the fact that high radiation source terms will not exist for virtually all cases when containment venting is used in accordance with the emergency procedures. Besides the potential negative impact of venting to the reactor enclosure on equipment reliability, venting to the atmosphere assures access to reactor enclosure equipment for repair, inspection, and/or manual operation.

- The indicated sequential use of available vent paths will minimize the rate of containment depressurization and limit the rate of release to that required to stabilize containment pressure since the vent paths are used in order from small to large. The indicated order of preference is from small to large diameter paths connected to the suppression pool air space or filtered through SGTS, and then from small to large for lines connected to the drywell. The one exception to this is the "6 inch ILRT line from drywell " which is not an independent line. This line is used last because its use would tend to reduce flow rate from the similar connection to the suppression pool air space. It is expected that only a few of these lines would be needed under any circumstances. It is estimated that a vent area of ~ 0.1 ft^2 will be adequate to control pressure

for all events when the reactor is subcritical and a vent area of ~1.0 ft^2 will be adequate for ATWS type events. It is apparent that, given the range of vent paths available for use at LGS, appropriately sized venting capability exists for this broad spectrum of events. Even if the rate of depressurization was rapid, containment loads would not be significant and backup injection sources would be available if temperature or NPSH limits were encountered (e.g. - CRD pumps, Condensate Pumps, RHR Service Water, etc.).

- Suppression pool loads due to SRV discharges will not be aggravated at the primary containment pressure limit. There are multiple EPG directives to ensure depressurization before this limit is reached and to prevent repressurization. SRV discharge loads at low RPV pressures have been demonstrated to be small for SRV T-quenchers as at LGS. Condensation will be stable at least up to saturation conditions.

- It is not expected that further delay in venting of containment (i.e. - beyond 70 psig) would have a significant effect on reduction of releases through such mechanisms as plateout and agglomeration since:

  ° Significant amounts of fission products will not be available for release for virtually all cases when containment venting is used in accordance with the emergency procedures.

  ° Venting occurs after long time periods (i.e. - many hours) for most cases.

  ° Planned releases are filtered and/or scrubbed by the suppression pool prior release.

- At the indicated pressure limits, the pneumatic supply pressure required for operation of the ADS SRV's will be within the capability of the installed systems. The normal range of gas supply pressure for the Primary Containment Instrument Gas (PCIG) system is 95-110 psig. Since the design of the SRV operators requires a pneumatic system differential pressure (i.e. - above containment pressure) of 25 psid to open and hold open the LGS SRV's, supply pressure will be adequate to assure SRV operability at the primary containment pressure limit. If somewhat higher pneumatic pressures were required, the PCIG operating pressure could be raised to the setpoint of its relief valves (120 psig) or the pressure regulators on the bottled backup supplied to the ADS valves could be raised.

Limerick Procedures T-200 will contain the detailed operating procedures relative to the use of the various containment vent paths.

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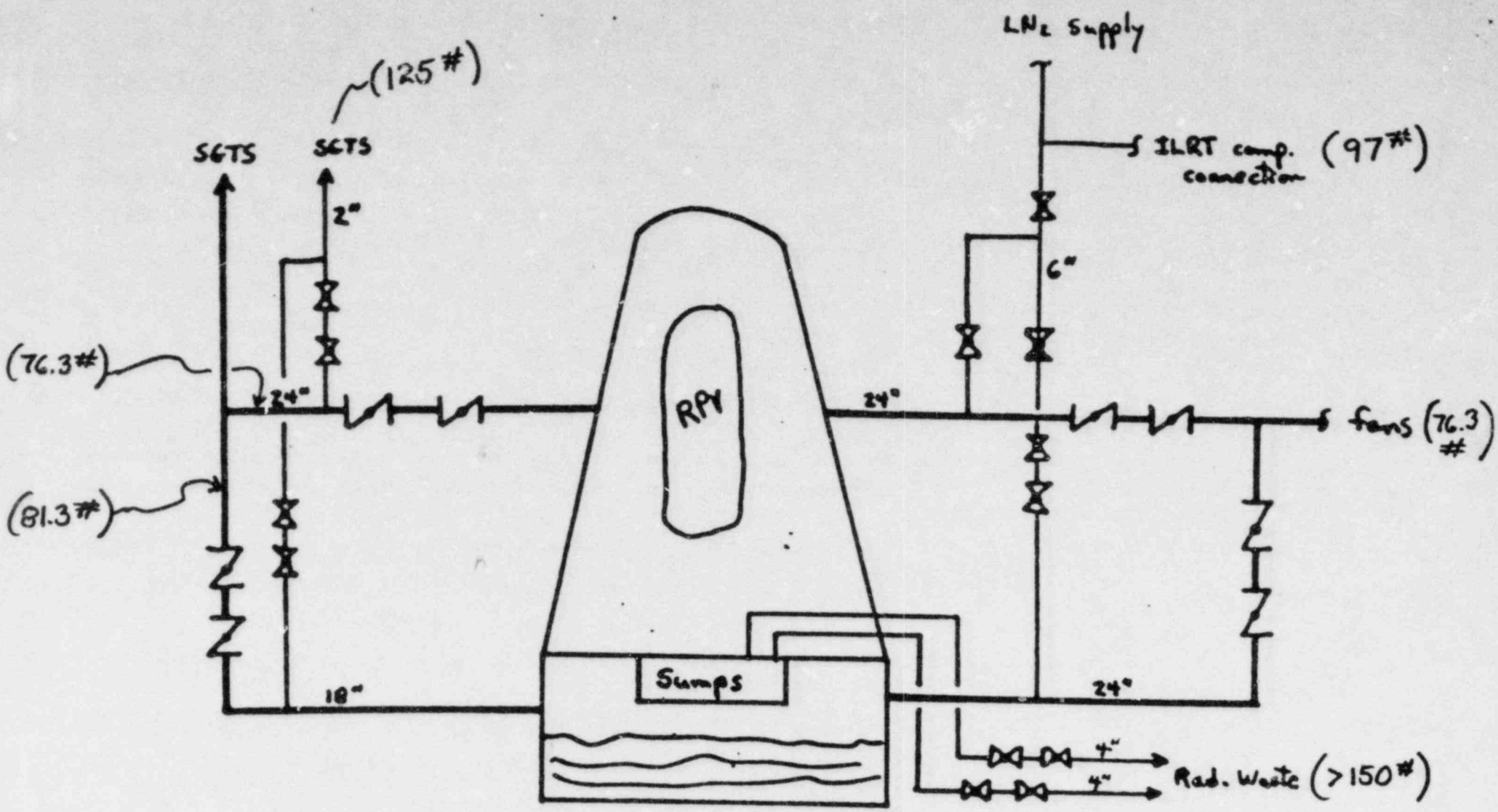

LGS Containment Venting Provisions