KG&E
THE ELECTRIC COMPANY
KANSAS GAS AND ELECTRIC COMPANY

GLENN L. KOESTER
VICE PRESIDENT - NUCLEAR

April 12, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

KMLNRC 85-086
Re: Docket No. STN 50-482
Ref: SLNRC 84-0018 dated 2/2/84 from NAPetrick, SNUPPS, to HRDenton, NRC
Subj: Containment Sump Screens

Dear Mr. Denton:

Flow criteria associated with the containment sump screens were revised in SNUPPS FSAR Revision 13 which was provided by the Reference. Up to that time KG&E commitments to Regulatory Guide 1.82 criteria had existed unchanged in the PSAR and FSAR since the SNUPPS Utilities responded to PSAR question Q040.15 in 1974.

The change came about when the Wolf Creek Architect/Engineer made final containment flood level calculations and was submitted to the NRC at KG&E's initiative. Recently we have found that the change should not have been made and KG&E now desires to reendorse our former commitments to Regulatory Guide 1.82.

Attached are marked up FSAR pages which reflect those previous commitments. These pages are hereby incorporated into the Wolf Creek Operating License Application. The FSAR will be formally revised in the first annual Wolf Creek FSAR update.

Yours very truly,

Kent R Brown

for Glenn L. Koester
Vice President - Nuclear

GLK:bb
Attach
xc:PO'Connor (2)
JCummins

B001
1/1

8504170014 850412
PDR ADOCK 05000482
P PDR

OATH OF AFFIRMATION

STATE OF KANSAS)
) SS:
COUNTY OF SEDGWICK)

I, Kent R. Brown, of lawful age, being duly sworn upon oath, do depose, state and affirm that I am Group Vice President - Technical Services of Kansas Gas and Electric Company, Wichita, Kansas, that I have signed the foregoing letter of transmittal for Glenn L. Koester, Vice President - Nuclear of Kansas Gas and Electric Company, know the contents thereof, and that all statements contained therein are true.

KANSAS GAS AND ELECTRIC COMPANY

ATTEST:

By Kent R Brown
Kent R. Brown
Group Vice President-Technical Services

E D Prothro
E. D. Prothro, Assistant Secretary

STATE OF KANSAS)
) SS:
COUNTY OF SEDGWICK)

BE IT REMEMBERED that on this 12th day of April, 1985, before me, Evelyn L. Fry, a Notary, personally appeared Kent R. Brown, Group Vice President - Technical Services of Kansas Gas and Electric Company, Wichita, Kansas, who is personally known to me and who executed the foregoing instrument, and he duly acknowledged the execution of the same for and on behalf of and as the act and deed of said Corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal the date and year above written.

EVELYN L. FRY NOTARY PUBLIC STATE OF

Evelyn L. Fry
Evelyn L. Fry, Notary

My Commission expires on August 15, 1985.

Since the containment spray pumps are designed to operate with entrained particles up to 1/4 inch in diameter and the minimum constriction size in the spray nozzles is 7/16 inch, this screening is adequate to assure proper system operability.

Each screening barrier has supports which are designed to withstand the differential pressure which would exist if the screens were 100 percent clogged. Both the screens and the grating are designed to withstand the differential pressure of 100-percent clogging, and sufficient screen area exists to allow over 50-percent clogging both screens without degrading spray pump NPSH. The sump baffle arrangement is shown in Figure 6.2.2-3.

The sump baffle arrangement does not allow flow into the sump below 6 inches above the concrete floor level surrounding the sump. This arrangement leaves ample depth for buildup of high-density debris without affecting sump performance. Additionally, the velocity of recirculated fluids approaching the sump, even during maximum flow conditions, will be well below 0.5 fps ~~trash rack will be between 0.01 and 0.08 fps for all modes of operation following a LOCA or MSLB~~, and thus a low velocity settling region for high-density particles is provided. ~~Table 6.2.2-9 provides flow velocities at several times and locations for a large LOCA and an MSLB.~~

Any debris which eludes the baffling, screens, and settling region passes into the sump through the 1/8-inch screen and will be drawn into the suction piping for the containment spray and residual heat removal systems. Such debris is small enough to pass through any restriction in either system or the reactor vessel channels, and will eventually be pumped back into the containment.

A comparison of the containment recirculation sump design features with each of the positions of Regulatory Guide 1.82, "Sump for Emergency Core Cooling and Containment Spray Systems," is provided in Table 6.2.2-1.

6.2.2.1.4 Tests and Inspections

Testing and inspection of components of the CSS, except those in the spray additive subsystem, are discussed in this section. Testing and inspection of components in the spray additive subsystem are discussed in Section 6.5.2.4.

Each containment spray pump has a shop test to generate complete performance curves. The test includes verifying total differential head (TDH) and NPSH for various flow rates. A shop thermal transient analysis, from ambient temperature to 350 F in 10 seconds, has been performed on the CSS pump. Results of that analysis assure that the design is suitable for the switchover from the injection to the recirculation phase.

TABLE 6.2.2-1 (Sheet 2)

	Regulatory Guide 1.82 Position	Recirculation Sump Design
4.	The floor level in the vicinity of the coolant sump location should slope gradually down away from the sump.	The floor is level in the vicinity of the sump. However, a 6-inch concrete curb is provided on which the screen is supported to prevent high density particles from entering the sump.
5.	All drains from the upper regions of the reactor building should terminate in such a manner that direct streams of water, which may contain entrained debris, will not impinge on the filter assemblies.	All drains in the upper regions of the reactor building are terminated in such a manner that direct streams of water which may contain entrained debris will not impinge on the filter assemblies.
6.	A vertically mounted outer trash rack should be provided to prevent large debris from reaching the fine inner screen. The strength of the trash rack should be considered in protecting the inner screen from missiles and large debris.	A vertically mounted outer trash rack is provided to prevent large debris from reaching the fine inner screen. This trash rack is designed to withstand the differential pressure which would exist if it were 100 percent clogged.
7.	A vertically mounted fine inner screen should be provided. The design coolant velocity at the inner screen should be approximately 6 cm/sec (0.2 ft/sec). The available surface area used in determining the design coolant velocity should be based on one-half of the free surface area of the fine inner screen to conservatively account for partial blockage. Only the vertical screens should be considered in determining available surface area.	A vertically mounted fine inner screen is provided. ~~Table 6.2.2-9 provides the coolant velocities for a large LOCA and an MSLB at several locations and at several operational times. The intent of item 7 is met.~~ The design coolant velocity at the inner screen, assuming that one-half of the free surface area is eliminated to account for partial blockage, that the sump level is minimal, and that the RHR pumps are operating at maximum runout flow, is approximately 0.5 fps.

Attachment to KMLNRC 85-086 2 of 3

Delete this page

SNUPPS

TABLE 6.2.2-9

SUMP SCREEN AND APPROACH VELOCITIES FOR LOCA AND MSLB CONDITIONS

OPERATIONAL PHASE/MODE	FLOOD DEPTHS(1) Min	FLOOD DEPTHS(1) Max	FLOW RATE, gpm	FLOW VELOCITIES - AVERAGE(2) FPS: Approach to Trash Racks(3)	Through Trash Rack(4) 50% Clogged	At Inner Screen(5)
LARGE LOCA						
o At ECCS Switchover	2002-1	2003-0	4800	0.07	0.27	0.26
o At Ctmt. Spray Switchover	2003-5	2004-6	8750	0.08	0.29	0.28
o During Long-Term Cooling(6)	2003-6	2004-4	4800	0.04	0.16	0.15
MLSB						
o At ECCS Switchover	2001-8	2002-8	1200	0.02	0.08	0.08
o At Ctmt. Spray Switchover	2003-0	2004-1	5150	0.05	0.09	0.19
o During Long-Term Cooling(7)	2003-1	2004-1	1200	0.01	0.04	0.04

NOTES:

(1) Flood depths (minimum and maximum) for each operational mode or phase are taken from Tables 6.2.2-6 and 6.2.2-6a.

(2) Average flow velocities are based on the average of the minimum and maximum flood depths since the average flood depth more accurately describes the expected flood depths. Minimum depths are used for NPSH available calculations, and maximum depths are for worst-case flooding analysis.

(3) The trash rack approach velocity is based on a point 6 inches in front of the trash rack. No blockage is assumed. This velocity more accurately describes the maximum velocity associated with debris settlement.

(4) This flow velocity is based upon the free area between the trash rack bars. Fifty percent clogging of this area is assumed.

(5) This flow velocity is based upon the free area of the sump screens exposed to flow. Fifty percent clogging of this area is assumed. It should be noted that the 6-inch curb has been provided to prevent screen blockage by heavy particles. The sump curb effectively reduces the free screen area by an additional 20 percent for a 3-foot flood depth; therefore, the effective blockage is approximately 70 percent.

(6) The velocities for long-term cooling following a LOCA assume that the containment spray system operation is terminated, since the cooling function is completed at switchover and iodine removal has been accomplished.

(7) The velocities for long-term cooling following an MSLB assume that containment spray system operation is terminated and the RCS pressure is at 400 psig, which is above the shutoff head of the RHR pumps. As noted on Table 6.2.2-6a, isolation of auxiliary feedwater to the broken loop occurs at 10 minutes which terminates blowdown to the containment. Long-term recovery from an MSLB will be through cooldown using the normal RHR suction from the primary loop hot legs. Once flow is established from the primary loop, suction from the sump will not be required.

Attachment to KMLNRC 85-086
3 of 3