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A Dravo Company

September 7, 1984

GTN- 69432

Texas Utilities Generating Company
Post Office Box 1002
Glen Rose, Texas 76043

Attention: Mr. J. B. George
Vice President/Project Gen. Manager

Gentlemen:

TEXAS UTILITIES GENERATING COMPANY
COMANCHE PEAK STEAM ELECTRIC STATION
G&H PROJECT NO. 2323
GIBBS & HILL PAINT REPORT

Based on our telephone conversation of September 5, 1984 with S.B. Burwell and C. Li of the NRC, we are attaching the following regarding the Report on "Evaluation of Paint and Insulation Debris Effects on Containment Emergency Sump Performance" June 1984.

Attachment 1: Revised Page 5-1 and Table 5.1-1 of the Report.

Attachemtn 2: Revised Page 8-11 of Section 8.0 attached to Gibbs & Hill letter GTN-69345 dated August 15, 1984.

Attachment 3: Response to NRC question regarding potential for blockage of narrow flow passages near the sumps.

Per S. Burwell

TRANSMITTED BY TELECOPIER
9-7-84

2222 S. Burwell
Reg File
LPDR
PDR
NTIS
NSIC
Region IV

Ltr & Encl

You are requested to submit the above information to the NRC after review.

Very truly yours,

GIBBS & HILL, INC.

R. E. Ballard

Robert E. Ballard, Jr.
Director of Projects

MC

REBa-MC:sce
1 Letter + Attachment

cc: ARMS (B&R Site) OL
J.T. Merrit (TUSI Site) 1L
R. Tolson (TUSI Site) 1L, 1A
R. Iotti (EBASCO, N.Y.) 1L, 1A
H.C. Schmidt (c/o Westinghouse Bethesda)+(Dallas) 12L, 12A
R.S. Howard/L. Berkowitz (Westinghouse Pa) 1L, 1A
S. Burwell (NRC Bethesda) 1L, 1A (Telecopy)

ATTACHMENT - 1
SHEET 1 OF 2

5.0 WATER VELOCITIES

Following the post-LOCA safety injection phase, when the contents of the RWST are exhausted, valving is aligned to provide for a recirculating flow of water from the containment emergency sumps.

The water flowing through various zones provides the motive force for the transport of debris to the containment emergency sumps. The available water velocity in a given area of the containment determines the transport potential for the debris.

The object of the water velocity analysis is to establish migration patterns for debris within the containment. The flow pattern within the containment is complex due to the presence of equipment supports, shield walls, openings in compartments, floor openings and related hydraulic resistances. The methodology used to estimate recirculation flow velocities within various regions of the containment is similar to that discussed in NUREG/CR-2791.

5.1 Sources of Water

The sources of water inside the containment following a LOCA determines the water level. The water level in turn determines the flow area for calculation of water velocities in various zones of the containment. The sources of water considered in this evaluation are given in Table 5.1-1. This table gives the maximum available water sources, the minimum and maximum amounts of water expected to be in the containment following a LOCA. The difference between the maximum and minimum water source is in the refueling water volume. The maximum water is based on the tank useable volume, i.e., 2 percent above high water level set point to the pump suction nozzle. The minimum water volume is based on the refueling water tank capacity from 2 percent below the high water level set point to 2 percent above the empty level set point (the empty level set point is 6 ft. 4 inches above the pumps suction nozzle.)

5.2 Water Levels at Sump Elevation (808 ft. EL)

The high and low water levels were calculated using the maximum and minimum water inventories given in Table 5.1-1. These calculations were based on the actual net volume available at 808 ft. EL. in the containment. The net volume was calculated by determining the gross volume and deducting the actual volumes of equipment, foundations, reactor cavity and other basement areas below 808 ft. elevation. The calculated high and low water levels are also presented in Table 5.1-1.

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ATTACHMENT - 1

SHEET 2 OF 2

TABLE 5.1-1

WATER INVENTORY AND LEVELS

Source	Available Capacity, cu.ft.	Maximum Quantity, cu.ft.	Minimum Quantity, cu.ft.
Reactor Coolant	12,740	12,740	12,740
Refueling Water Storage Tank	70,400	67,990	53,570
Accumulators	3,810	3,810	3,810
Miscellaneous	920	920	470
Total	87,870	85,460	70,590
Water Level (ft)[1]		817.5	814.8

Note:

[1] Based on calculation of actual net volumes available excluding equipment volumes, foundations, reactor cavity and other basement areas below 808 ft. EL.

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Moreover, in the free flow orifice of two inches, the velocity at the fine screen is about 1.18 fps and the velocity at the coarse screens inlet is about 0.4 fps. At these higher velocities the particles will tumble and behave more as an equivalent sphere than flakes. For the lighter particle, the 1/8 inch steel paint chip with a specific gravity of 1.5 and thickness of 5 mils, the terminal velocity of an equivalent sphere would be about 0.28 fps. Tumbling particles at this velocity would be unaffected by the 2 inch free area.

In reality the particle will behave somewhere between the case of the untumbling flake and the tumbling flake, and hence it is expected that an approximate 2-inch band of screen at the top will remain free. It must also be stated that the assumption of all particles of paint having a specific gravity of 1.5 is conservative, as is the assumption that all will have an equivalent diameter of 1/8 of an inch. The uncertainty in this type of analysis is discussed later in this section .

In addition to the free band of fine screens that would remain on all sides of the sump, there is some additional area of the screen which will not be blocked.

The amount of additional open area is described herein after.

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RESPONSE TO NRC QUESTION

NRC Question:

There are columns near the sumps which create narrow flow passages. If paint debris reaches these pasages, they may be blocked by debris accumulation. Evaluate this potential for two typical locations: a) near Column-3 and b) near sump screen sections A2 and B1.

Response:

Paint debris accumulation will not occur in the narrow flow passages because the higher water velocities in these passages will tend to move the debris away from the passages.

Even if paint debris accumulation at the narrow passages is postulated, such an accumulation will be uniform on the floor. However, for the purpose of analysis, we have very conservatively assumed that all the paint debris will form a mound at the passage with a 45° angle of repose. The results of calculations for evaluating the potential for blockage of the two typical passages is as follows:

A) Passage at Column-3 (see attached figure)

The volume of debris required to block the passage is 216 cu. ft. The available debris at this location is determined by conservatively assuming that all debris at screen sections D3 thru D7 will accumulate at the passage. The quantity of debris at screen sections D3 thru D7 was previously calculated and presented in Table 9.1-2 (attachement to GTN-69345, dated August 15, 1984). From Table 9.1-2, the quantity of debris available for blockage of the passages at Column-3 is only 82 cu. ft.

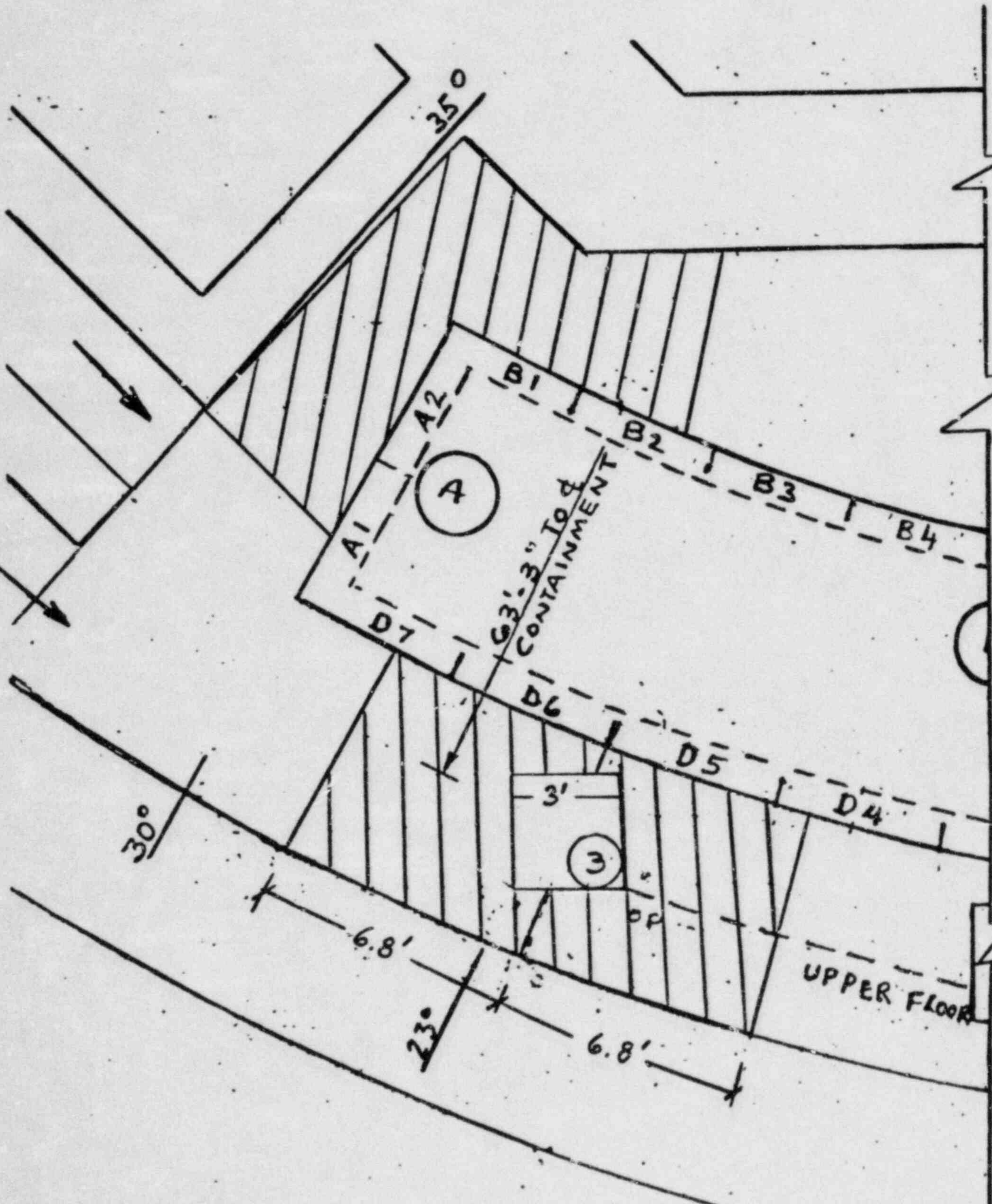
b) Passage at Screen Sections A2 and B1.

The calculated quantity of debris required to block this passage is 138 cu. ft. The total quantity of debris at Screen Sections A1, A2, and B1 thru B7 is only 22 cu. ft.

From the above, it is concluded that there is no possibility of blocking flow passages near the sumps, because the available paint debris is considerably less than the quantity required to cause blockage.

FIGURE

ATTACHMENT-3
SHEET 2 OF 2



SCALE : 1/4" = 1'