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Regulatory File Cy.

July 2, 1973

Mr. D. J. Skovholt
Assistant Director for
Operating Reactors
Directorate of Licensing
U.S. Atomic Energy Commission
Washington, D.C. 20545

Subject: Addendum No. 1 to Dresden Special Report No. 28 Concerning Handling of the IF-300 Spent Fuel Shipping Cask, AEC Dkt 50-237

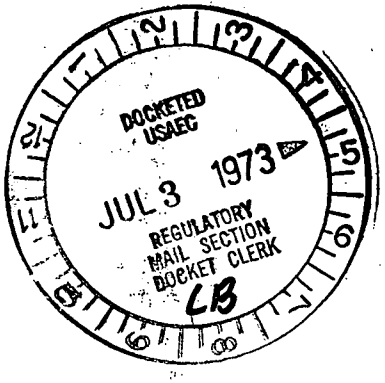
Dear Mr. Skovholt:

On May 31, 1973, we submitted analyses and procedures for handling the General Electric IF-300 spent fuel shipping cask in the Dresden 2 fuel pool which contains low exposure irradiated fuel. Ensuing conversations with your staff have raised questions regarding accidents considered to be less severe than those discussed in the May 31, 1973 report. Enclosed is Addendum 1 to Special Report No. 28 which discusses the effect of cask drop on the fuel pool walls. As a result of these analyses, the exposed fuel will be moved away from the projected potential impact areas prior to positioning the cask over the pool, subject to available alternate locations.

One signed original and 39 copies of this report are provided for your use.

Very truly yours,

L. D. Butterfield, Jr.
Nuclear Licensing Administrator



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CASK DROP ANALYSIS

DRESDEN STATION

The following three possibilities were evaluated to study the effect of cask drop on the pool walls.

(1) INCLINED DROP

If one of the trunions fails causing the second one to follow, when the cask is about to be lowered into the pool, the cask can drop in a tilted position and hit the top of the pool wall as shown in figure 1. To attain this position, the cask will drop a vertical distance of 9 feet. The velocity of impact then will be 24'/sec. Assuming the area of impact equal to two sq. ft., the depth of penetration into the concrete will be 4.64". This results in an equivalent static force of 4620 Ks. The vertical component of this force acts in the plane of the wall and the horizontal component is initially transferred to the floor beam. The compressive stress in the beam due to impact is 2.38 Ksi which is less than the ultimate strength of 4 Ksi. The horizontal force is ultimately transferred to the shear walls thru the floor slab acting as a diaphragm.

(2) CASK IN POOL ACCIDENT

If the crane trolley is accidentally started before the cask is freed from crane hook, the top of the cask may hit the pool wall. The movement of cask will be along the travel

path of the trolley. The maximum velocity of impact is 10 ft./min. equal to the maximum trolley speed under loaded conditions. The actual impact velocity will be even less since the distance between the cask and edge of wall is only 1'-6" and the cask is immersed in water.

Due to the very small impact velocity, it is concluded that there will be no dynamic effect due to this impact.

(3) EFFECT ON ADJACENT WALL

While lowering the cask, the cask may hit the wall on column line (L) and tip. Under that condition the top corner of the cask will hit the adjacent wall. Since the velocity of impact will be small, there will be only local deformation in the wall, without affecting the integrity of the entire wall panel.

If the cask strikes the curb and then plunges into the pool, it is anticipated that the deviation from its normal path will be 30° horizontally. This is shown on Dwg. B-603 which also indicates which fuel elements must be moved to avoid being damaged. The drawing also shows a 45° deviation and the fuel elements that will be removed if possible to provide a larger factor of safety.

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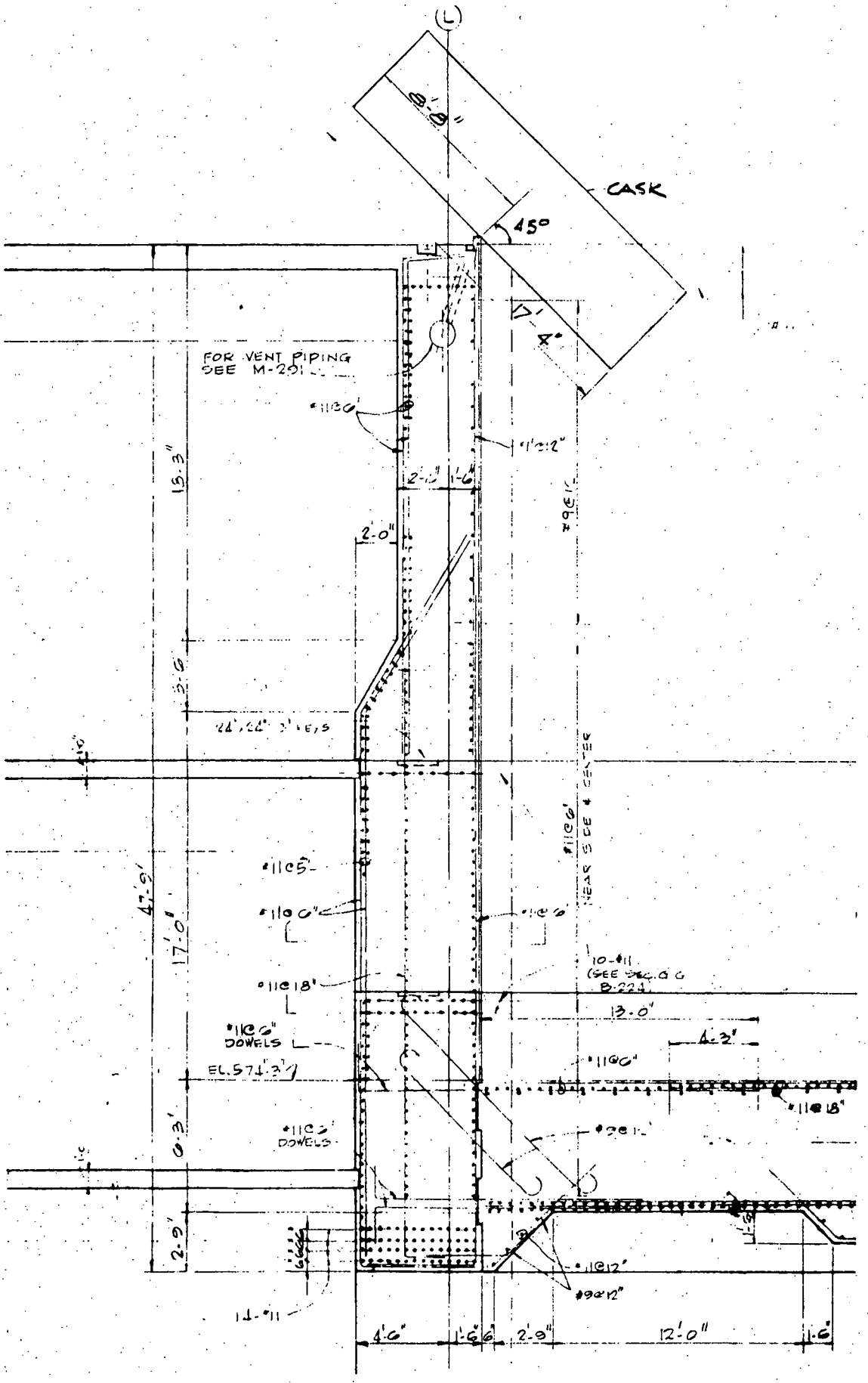

FIGURE 1

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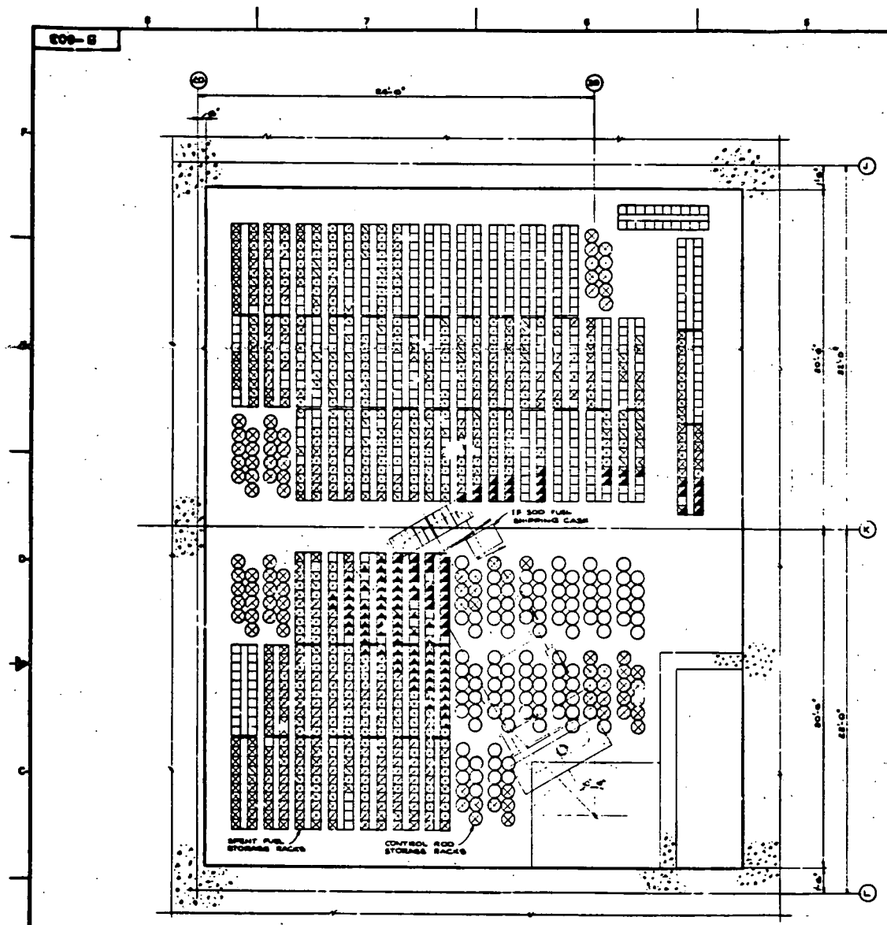

EXIST. UNIT 2 FUEL POOL STORAGE RACK LAYOUT

NOTES

1. FOR GENERAL NOTES SEE DWG. S-903
2. ⊗ INDICATES 60-ST. FUEL ELEMENTS IN STORAGE RACK.
3. ⊗ INDICATES 24-ST. CONTROL RODS IN STORAGE RACK.
4. ⊗ INDICATES FUEL ELEMENTS THAT MUST BE RELOCATED.
5. ⊗ INDICATES FUEL ELEMENTS WITCH SHOULD BE RELOCATED IF POSSIBLE.

REFERENCE DRAWINGS

PROPOSED RACK RELOCATION
IN SPENT FUEL POOL
DRESDEN NUCLEAR POWER STATION
COMMONWEALTH EDISON CO.
CHICAGO, ILLINOIS

SARGENT & LUNDY
CHICAGO

DRAWING NO.
S-903

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