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NUCLEAR PRODUCTION

TELEPHONE
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March 20, 1986

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

Attention: Ms. E.G. Adensam, Chief
Licensing Branch No. 4

Subject: McGuire Nuclear Station
Docket Nos. 50-369 and 50-370
TN-8, TN-8L Multielement Spent Fuel Casks License Amendments

Dear Mr. Denton:

Attached are proposed license amendments (pursuant to 10 CFR 50.90) to Facility Operating Licenses NPF-9 and NPF-17 for McGuire Nuclear Station Units 1 and 2, respectively. While the multielement TN-8 spent fuel cask is authorized for use at McGuire with MNS fuel in accordance with FSAR Section 9.1.2, the proposed amendments seek to permit use of the TN-8 (and TN-8L) casks for receipt of Oconee irradiated fuel in addition to the previously authorized NFS-4 (NAC-1) and NLI-1/2 single fuel assembly casks.

Attachment 1 contains the proposed Facility Operating Licenses changes. Attachment 2 discusses the Justification and Safety Analysis to support the proposed changes. Included in Attachment 2 is A) the TN-8 and TN-8L cask drop analysis for McGuire Nuclear Station; and B) cask data detailing the differences between the TN-8 and TN-8L casks. Pursuant to 10 CFR 50.91, Attachment 3 provides an analysis performed in accordance with the standards contained in 10 CFR 50.92 which concludes that the proposed amendments do not involve a significant hazards consideration. The proposed amendments have been reviewed and have been determined to have no adverse safety or environmental impact.

Pursuant to 10 CFR 170.3(y), 170.12(c), and 170.21, Duke Power proposes that this application contains license amendments for McGuire Units 1 and 2 subject to fees based on the full cost of the review (to be calculated using the applicable professional staff rates shown in 10 CFR 170.20) and must be accompanied by an application fee of $150.00, with the NRC to billed Duke Power at six-month intervals for all accumulated costs for the application or when review is completed, whichever is earlier. Accordingly, please find enclosed a check in the amount of $150.00.

A001 1/1 w/check $150 #18261508

Since this amendment will provide a necessary extension of the Oconee Nuclear Station's ability to maintain adequate storage capacity and inasmuch as section 131 of the Nuclear Waste Policy Act directs the Federal Government to "encourage and expedite the effective use of existing storage facilities", it is requested that the proposed amendments be approved by July 1, 1986. At that time, it is planned to use the multielement spent fuel casks in shipment of Oconee spent fuel to McGuire Nuclear Station. These shipments are necessary to maintain a prudent operating reserve of spent fuel storage capacity at Oconee Nuclear Station.

Should there be any questions or if additional information is required, please advise.

Very truly yours,

Hal B. Tucker

PBN/jgm

Attachments

xc: Dr. J. Nelson Grace, Regional Administrator
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
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Mr. Dayne Brown, Chief
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Mr. Darl Hood, Project Manager
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Office of Nuclear Regulatory Commission
Washington, D.C. 20555

HAL B. TUCKER, being duly sworn, states that he is Vice President of Duke Power Company; that he is authorized on the part of said Company to sign and file with the Nuclear Regulatory Commission this revision to the McGuire Nuclear Station License Nos. NPF-9 and NPF-17 and that all statements and matters set forth therein are true and correct to the best of his knowledge.

Hal B. Tucker

Hal B. Tucker, Vice President

Subscribed and sworn to before me this 20th day of March, 1986.

Linda L. Kessler

Notary Public

My Commission Expires:

Mar 6 1989

LINDA L. KESSLER
NOTARY PUBLIC
MECKLENBURG COUNTY, N.C.

ATTACHMENT 1

PROPOSED MCGUIRE UNIT 1 AND 2 FACILITY OPERATING LICENSES CHANGES

Revise Facility Operating License NPF-9, McGuire Unit 1 License Paragraph 2.K Condition e to read:

e. Receipt of irradiated Oconee fuel shall be limited by the use of the NFS-4 (NAC-1), NLI-1/2, TN-8, or TN-8L spent fuel casks.

Revise Facility Operating License NPF-17, McGuire Unit 2 License Paragraph 2.J Condition e to read:

e. Receipt of irradiated Oconee fuel shall be limited by the use of the NFS-4 (NAC-1), NLI-1/2, TN-8, or TN-8L spent fuel casks.

ATTACHMENT 2

JUSTIFICATION AND SAFETY ANALYSIS

McGuire Nuclear Station Facility Operating Licenses NPF-9 and NPF-17 for Units 1 and 2 respectively currently include authority to receive, possess and store 300 irradiated Oconee Nuclear Station fuel assemblies (reference Unit 1 License Paragraph 2.K and Unit 2 License Paragraph 2.J). Receipt at McGuire Nuclear Station of irradiated Oconee fuel is limited by the use of the NFS-4 (NAC-1) or NLI-1/2 single fuel assembly spent fuel casks (reference License Paragraphs 2.K.e and 2.J.e for Units 1 and 2 respectively). While the current McGuire FSAR provides for use of the multielement TN-8 cask with McGuire spent fuel, the proposed amendments seek to permit use of the multielement TN-8 (and TN-8L) casks for receipt of Oconee spent fuel at McGuire in addition to the previously authorized casks.

Of the 300 approved, approximately 50 Oconee assemblies have been received at McGuire Nuclear Station. These transfers are currently being made with the single fuel assembly NLI-1/2 spent fuel cask. Duke Power Company's plans are to use the TN-8L spent fuel cask to expedite the transfers. With a transition to the larger cask by mid 1986, Duke expects to have the remaining 250 assemblies shipped by mid 1988. Note that amendments to the Oconee Facility Operating License (docket nos. 50-269, 50-270, and 50-287) revising Oconee Technical Specification 3.8.13.b to allow use of the multielement spent fuel casks in the Oconee Unit 3 spent fuel pool were submitted by Mr. H.B. Tucker (DPC) letter to Mr. H.R. Denton (NRC/ONRR) dated November 19, 1985. No McGuire Nuclear Station Technical Specification changes are necessary for use of the multielement casks.

There is a need to maintain a prudent operating reserve (POR) in each spent fuel pool on the Duke system. POR includes capacity for core off-load, reload batch, and upender access. Oconee currently has approximately a 1/2 year margin prior to reaching the POR level. Spent fuel shipments on Duke's system have been found to be labor intensive, and, given activities being conducted in two pools serving three reactors, difficult to schedule consistently. Shipping rates approximating the rate of fuel discharges into the Oconee pools would be difficult to maintain utilizing only a single element cask. Duke therefore believes the use of a multielement spent fuel shipping cask is essential to prevent loss of available spent fuel storage capacity to unacceptable levels. There are a number of operational advantages of the TN-8L over the NLI-1/2 cask. They are as follows:

- A larger capacity cask such as the TN-8L will require fewer shipments than the single assembly cask, and fewer shipments will necessitate the expenditure of fewer resources (e.g. lower station manpower requirements).

- Greater confidence in maintaining the necessary shipment rate.
- Though negligible, total radiation exposure is expected to be lower.
- Probability of adverse public impact is reduced since only one third as many shipments must be made.

Use of the TN-8L shipping cask also enhances the ability to effectively address future contingencies.

A cask drop evaluation had previously been performed to assess the possibility of a spent fuel cask entering the spent fuel pool. This evaluation included analysis of the following three truck casks which were regarded as potential candidates for spent fuel transfer intrastation or between McGuire Nuclear Station and Oconee Nuclear Station: 1) Model No. NFS-4, Nuclear Fuel Services, Inc.; 2) Model No. NLI-1/2, National Lead Company; and 3) Model No. TN-8, Transnuclear, Inc. A description of the analysis and the results of the analysis for the NFS-4 truck cask is given in FSAR section 9.1.2.3.6. The analysis for the NFS-4 cask was originally submitted to the NRC via W.O. Parker (DPC) letter to H.R. Denton (NRC/ONRR) dated March 2, 1979, with the NLI-1/2 analysis subsequently submitted via Parker to Denton letter dated August 2, 1979. The analysis for the TN-8 cask was originally referenced in the McGuire FSAR in Revision #38 issued on August 31, 1979. This TN-8 analysis has been expanded to include use of the TN-8L cask and revised handling requirements and operating procedures. This analysis is provided in Attachment 2A. The analyses of the NLI-1/2 and TN-8 and TN-8L truck casks are fundamentally similar to that of the NFS-4 cask and all show that the respective casks will not enter the spent fuel pool.

Note that the effects of spent fuel pool reracking on previously performed analyses (especially with respect to missiles) were considered and found to be acceptable (reference MNS Unit 1 License amendment 35, Unit 2 License amendment 16). The acceptability of these previous analyses for McGuire Units 1 and 2 is documented in MNS Unit 1 License amendment 44 and Unit 2 License Amendment 25. Although Duke intends to use the TN-8L cask rather than the TN-8 cask, as shown in Attachment 2B (which details the differences between these two casks) the TN-8L cask is essentially identical to the TN-8 cask (i.e. same dimensions, etc.) with the exception that the TN-8L cask is slightly lighter (by approximately 2000 lbs.). Consequently, the previously performed analyses with respect to the TN-8 cask bound the TN-8L cask. Therefore the previously analyzed radiological consequences/environmental impact of a cask/heavy load accident involving the heavier multielement spent fuel casks are unaffected.

Use of the heavier TN-8 cask (which bounds use of the TN-8L cask) along transportation routes was evaluated and found to be permitted. Cask platforms, decon pits, operating decks, and cask loading area spacers were determined to be structurally capable of supporting these casks. Spent fuel cask handling and auxiliary component cranes and lifting devices were evaluated for use of the TN-8 and TN-8L casks and determined to have adequate capacity (although a new lift adapter will be required). Use of the casks was evaluated with respect to NUREG 0612 considerations and determined to be acceptable. An assessment of dimensional checks to assure the casks will fit into the decon pits, cask platforms, etc. was performed and determined that certain modifications will be

necessary to allow use of these casks (e.g. to the decon pits). In addition, new fuel handling tools will be obtained for use of the casks. These matters, along with necessary procedural revisions and personnel training will be completed prior to use of the casks. It is planned to conduct dry runs with the TN-8L cask on completion of the current NLI-1/2 shipments.

The TN-8 and TN-8L shipping casks have been issued a Certificate of Compliance for radioactive materials packages, which was recently renewed by the NRC (Certificate No. 9015, Revision 10, expiration date January 31, 1991). A description of the TN-8 and TN-8L casks along with various other information is contained in the Certificate of Compliance.

In summary, it is necessary to remove fuel from the Oconee spent fuel pools to provide room for future discharges. The NRC has approved storage of Oconee spent fuel at McGuire Nuclear Station. In light of the operational and schedular advantages of the TN-8L cask, Duke Power Company believes the prudent course is to utilize the TN-8L cask as soon as practicable. The exact date would be contingent upon completion of required station modifications, cask availability and procurement of associated equipment, procedure development, training of personnel, and approval of the Oconee and McGuire License amendment requests.

ATTACHMENT 2A

McGUIRE NUCLEAR STATION

TN-8 AND TN-8L CASK DROP ANALYSIS

In order to allow an alternative to the use of the NFS-4 and NLI-1/2 casks for the shipment of spent fuel from Oconee Nuclear Station to McGuire Nuclear Station, the following information is submitted concerning the use of the TN-8 and TN-8L casks. This analysis (which is a revised and expanded version of a TN-8 cask analysis originally referenced in McGuire FSAR Rev. 38) evaluates the consequences of dropping or tipping, or a combination of both, of the TN-8 and TN-8L casks in the McGuire spent fuel handling building.

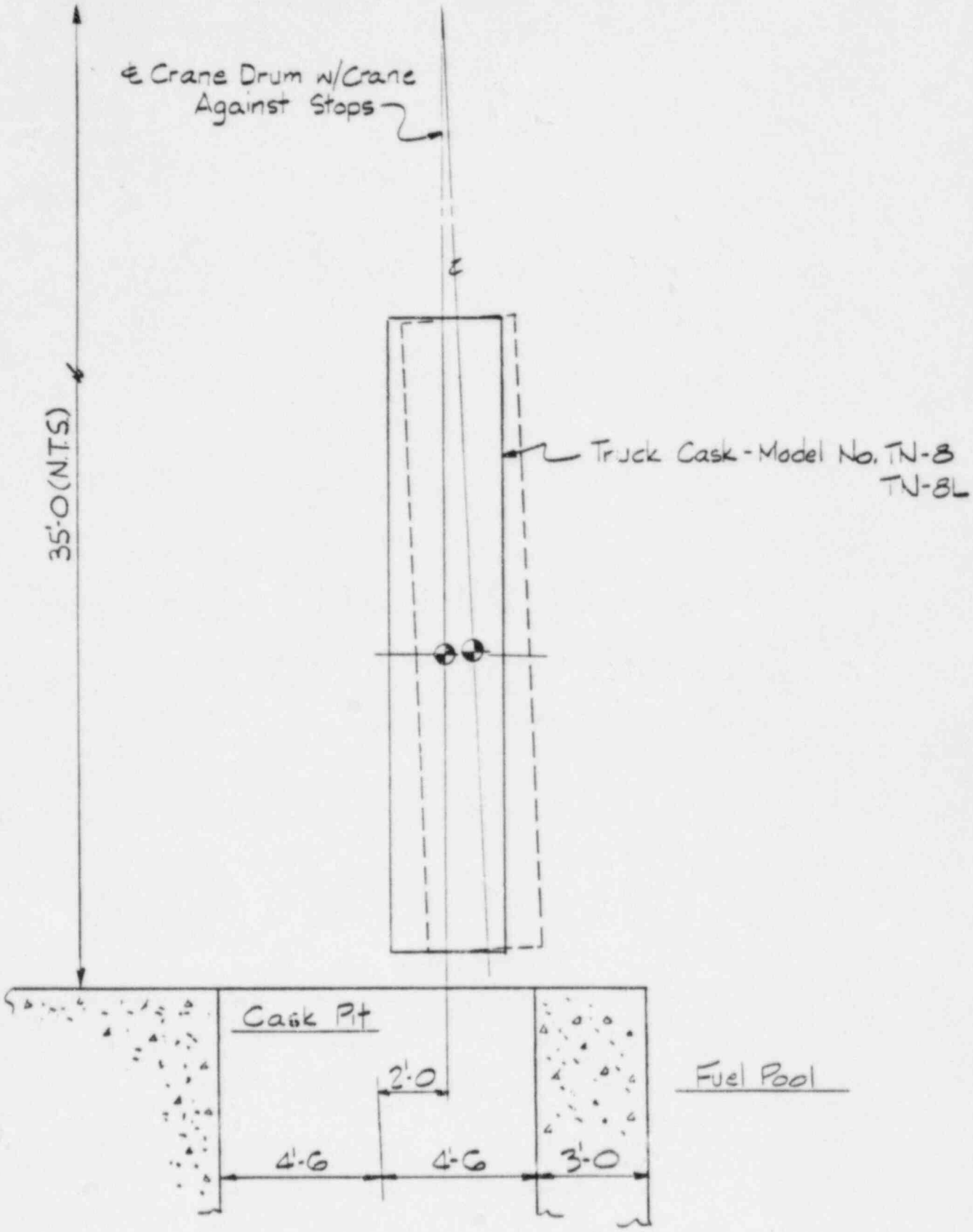
Cask Model Nos. TN-8 and TN-8L are truck casks supplied by Transnuclear, Inc. Each cask weighs approximately 40 tons and is 217 inches long including top and bottom shock absorbing covers. The area in which the cask is handled is designed for a 30 foot drop of a proposed 100 ton rail cask and the structure is reinforced concrete with a rock foundation. Local damage to the concrete will be negligible and no safety related equipment is located in the cask travel path. The path of the casks will be controlled as shown in FSAR Figure 9.1.2-2 (Ref. also McGuire Technical Specification Figure 3.9-1). In addition, the cask will be handled at a maximum clearance height over the pool deck of 12". The following circumstances of dropping the cask were considered to be most critical and the assumptions and conclusions are presented:

Case #1- The cask handling crane is assumed to be traveling along the path(s) defined in McGuire Technical Specification Figure 3.9-1 at its maximum speed of 50 fpm and hits the crane stops nearest the spent fuel pool. The crane stops, and the cask is assumed to continue traveling toward the spent fuel pool rotating about a line through the centerline of the crane drum. The cask continues to swing until the kinetic energy is completely converted to potential energy (i.e. the cask raises up as it rotates about the crane drum). At the instant the cask swings as close to the spent fuel pool as possible, the cable breaks and the cask falls. The conclusion is that the cask falls on the NE or NW edge of the cask pit and spent fuel pool walls and falls away from the spent fuel pool due to its center of gravity being within the cask pit envelope. See Sketch #1 for an illustration of this case.

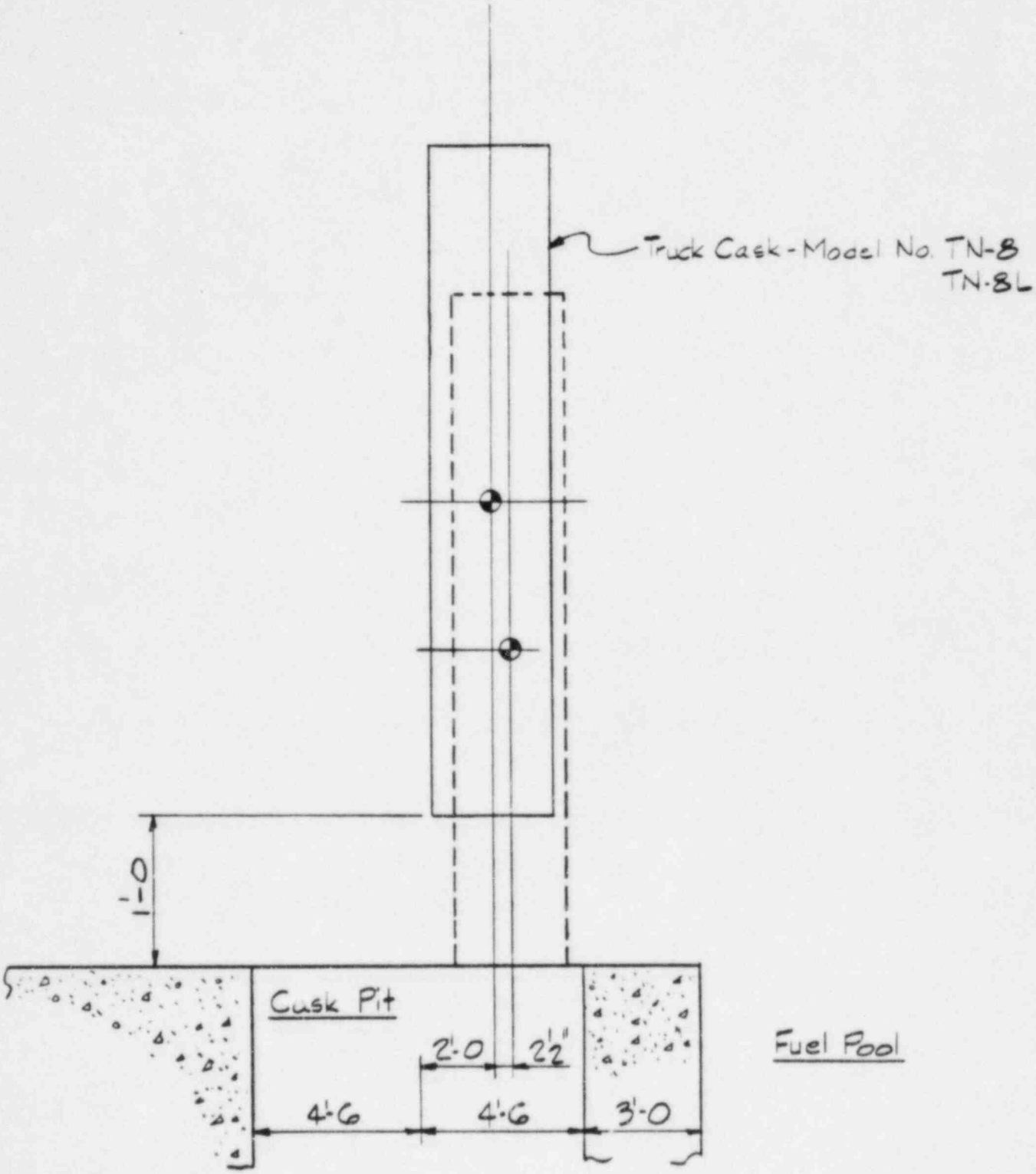
Case #2- The cask handling crane is assumed to be traveling along the path(s) defined in McGuire Technical Specification Figure 3.9-1 at its maximum speed of 50 fpm and hits the crane stops nearest the spent fuel pool. The crane stops and the cable breaks at the same instant, therefore the cask does not swing but is moving at 50 fpm. The cask is assumed to be at its highest position, which is 1 foot off the floor. The distance the cask travels at 50 fpm in the time it takes for the cask to fall 1 foot is determined. The cask will hit the NE and NW edge of the spent fuel pool and cask pit wall and tend to rotate about its edges on the wall(s). It is determined that the amount of kinetic energy is not sufficient to cause the cask to fall into the spent fuel pool. See Sketch #2 for an illustration of this case.

Case #3- The cask is assumed to be over the corner edge of the north and east or west cask pit walls and the cable breaks (Other locations will result in the cask overturning and falling away or perpendicular to the spent fuel pool wall). Energy losses at impact with the cask pit and spent fuel pool wall are conservatively considered and the results of the analysis show that the

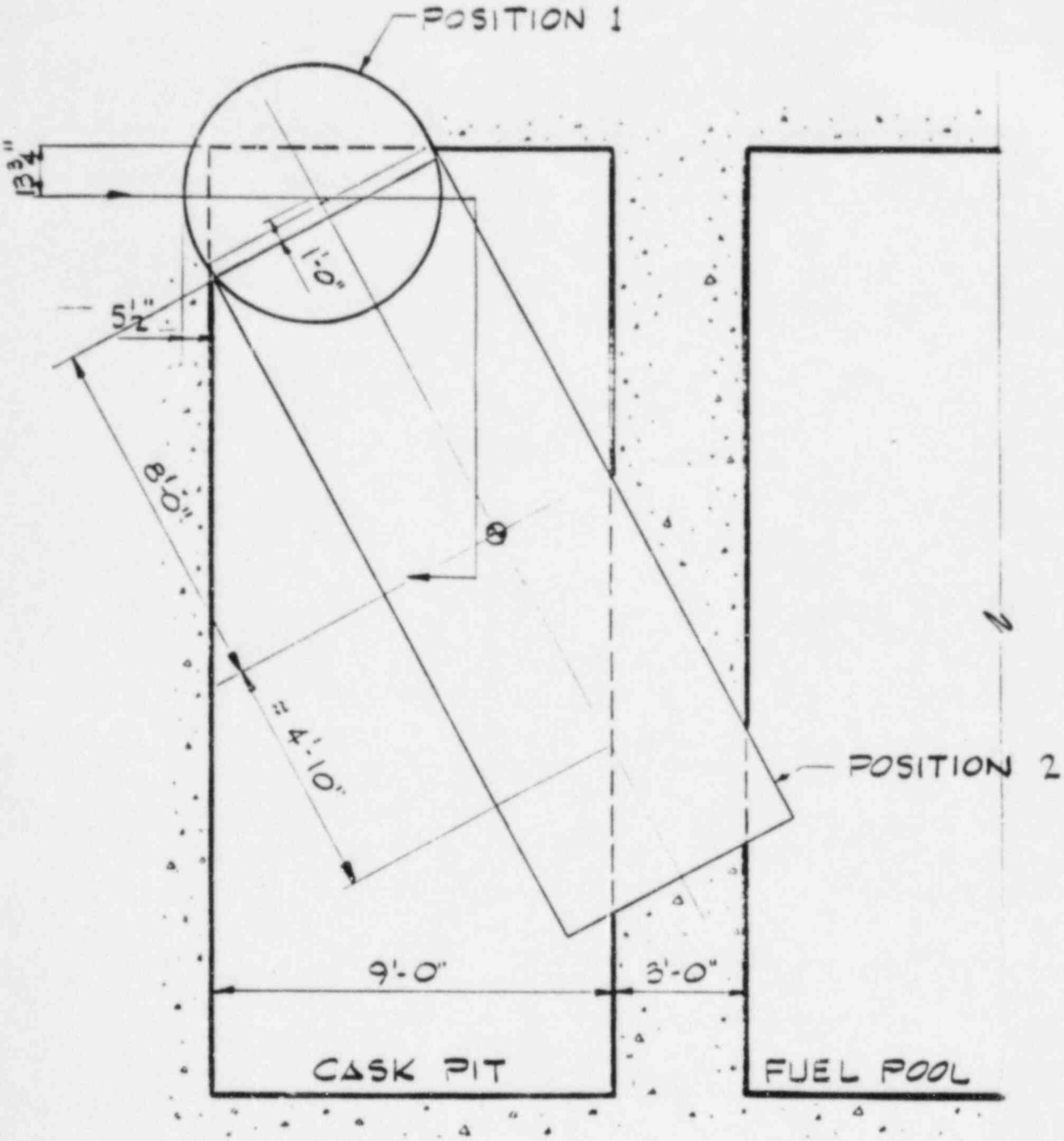
remaining energy is not sufficient to cause the cask to fall into the spent fuel pool. See Sketch #3 for an illustration of this case.


℄ Crane Drum w/Crane
Against Stops
35'-0 (N.T.S.)
Truck Cask - Model No. TN-8
TN-8L
Cask Pit
2'-0
Fuel Pool
4'-6
4'-6
3'-0

Sketch 1


Truck Cask - Model No. TN-8
TN-8L
1'-0
Cask Pit
2'-0
2½"
Fuel Pool
4'-6
4'-6
3'-0

Sketch 2



CASK TN-8 & TN-8L

SKETCH #3

ATTACHMENT 2B

CASK DATA

	TN-8	TN-8L
Length	15 ft. 11 7/16 in.	15 ft. 11 7/16 in.
Outside Diameter	5 ft. 6 15/16 in.	5 ft. 6 15/16 in.
Weights		
Empty cask with lid and without shock absorbing covers	72,780	70,830
Maximum contents (fuel assemblies and components)	4,850	4,850
Weight of water in compartments with fuel	1,130	1,130
Skirt and bottom protective cover	150	150
Primary lift beam	2,850	2,850
Total Weight on Hook	81,760	79,810

NOTE: All values are without shock absorbing covers.

Model No. TN-8 has 150 rows of fins and Model No. TN-8L has 104 rows of fins. These are vertical rows of cooling fins welded to the outer shell. The fewer number of fins on Model TN-8L is to reduce the weight of the cask. The cooling fins extend between each end drum. The maximum authorized heat loads are 35.5 kilowatts for the TN-8 and 23.7 for the TN-8L. The center of gravity of the Model TN-8L is essentially the same as that for the TN-8L. Additional data on these casks is contained in the NRC's Certificate of Compliance No. 9015.

ATTACHMENT 3

ANALYSIS OF SIGNIFICANT HAZARDS CONSIDERATION

As required by 10 CFR 50.91, this analysis is provided concerning whether the proposed amendments involve significant hazards considerations, as defined by 10 CFR 50.92. Standards for determination that a proposed amendment involves no significant hazards considerations are if operation of the facility in accordance with the 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.

The proposed amendments seek to permit use of the multielement TN-8 and TN-8L spent fuel casks for receipt of irradiated Oconee fuel in addition to the previously authorized NFS-4 (NAC-1) and NLI-1/2 single element truck casks. Each of the three standards is discussed below:

First Standard

Use of the multielement casks does not involve a significant increase in the probability of an accident previously evaluated since the previously evaluated cask accident causal mechanisms are unchanged. Further, since the multielement casks require only one third as many shipments as the single element casks for a given number of assemblies, the probability of an accident is significantly reduced.

The TN-8 and TN-8L shipping casks have been issued a Certificate of Compliance for radioactive materials packages by the NRC (as were for the NFS-4 (NAC-1) and NLI-1/2 casks). The cask drop analysis (ref. attachment 2A) shows that the additional weight and larger dimensions of the TN-8/8L casks do not affect the end result of the cask drop (In no case does the cask enter the spent fuel pool). Also, the adequacy of previously performed radiological consequence/environmental impact of cask/heavy load accident work has been verified for the larger casks. Therefore, a significant increase in consequences of previously evaluated accidents does not occur as a result of using these larger casks.

In addition, the current version of the McGuire FSAR which, as discussed in Attachment 2, references the TN-8 cask and associated analysis and provides for use of the TN-8 cask with McGuire spent fuel, combined with the slight differences between the TN-8 and TN-8L casks, further strengthens the conclusion that the use of either of these multi-element casks for receipt of Oconee spent fuel would not involve a significant increase in probability or consequences of a previously evaluated accident. This final argument is based on the fact that the outcome of a cask drop accident is independent of the type of fuel (B&W vs. Westinghouse) being transferred in the cask.

Second Standard

The TN-8 and TN-8L shipping casks have been issued and continue to hold an NRC Certificate of Compliance for radioactive materials packages. Also, a thorough investigation of weight limitations and other restrictions along the currently approved transportation routes between Oconee and McGuire was performed. Duke was therefore able to conclude that the use of these heavier multi-element casks along these routes would be permitted.

Following the near-term completion of on-going modifications to McGuire cask handling equipment, the use of the heavier casks on cask platforms, decon pits, operating decks and cask loading area spacers will be permitted without restrictions or procedural changes. Additionally, their use by spent fuel cask handling and auxiliary cranes and lifting devices (including NUREG 0612 considerations) will be unrestricted and consistent with existing single element cask handling procedures.

Consequently, with no requirements for route changes, recertification of casks, or significant variations in procedures and equipment usage, Duke has determined that no new or different kinds of accidents other than the previously evaluated cask drop accident will be created as a result of this proposed amendment.

Third Standard

The TN-8/8L shipping casks and the NFS-4 (NAC-1) and NLI-1/2 casks have been issued NRC Certificates of Compliance. It is assumed that both the single element and multi-element casks were certified using standardized safety margins. Additionally as discussed in Attachment 2A, the final results of the single element and multi-element cask drop analyses are identical. Consequently, from both the standpoints of cask use and cask handling, the use of the larger multi-element cask does not involve a significant reduction in a margin of safety.

Additionally, with respect to the current FSAR reference to the TN-8 cask allowing for use of the TN-8 cask with McGuire spent fuel (as discussed in Attachment 2), any previously determined margins of safety would not be significantly reduced by the introduction of irradiated Oconee fuel or the use of the slightly different TN-8L shipping cask.

Based upon the preceding analyses, Duke Power Company concludes that the proposed amendments do not involve a significant hazards consideration.