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SUBJECT: Forwards addl info re spent fuel pool reracking Amend Applications 78 & 84,per 890328 & 29 telcons.

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F. R. NANDY
MANAGER OF NUCLEAR LICENSING

TELEPHONE
(818) 302-1896

April 19, 1989

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

Gentlemen:

Subject: Docket Nos. 50-361 and 50-362
Spent Fuel Pool Reracking
Amendment Application Nos. 78 and 64 (PCN-287)
San Onofre Nuclear Generating Station
Units 2 and 3

Reference: March 10, 1989 letter from Kenneth P. Baskin (SCE) to Document Control Desk, Subject: Same as above

In telephone conversations on March 28 and 29, 1989, the NRC Chemical Engineering Branch reviewer identified additional information needed to review the subject spent fuel pool reracking license amendment applications. The information requested, related to the use of Boraflex neutron absorbing material, was provided verbally during the March 29, 1989 telephone call, and, as requested, is also provided as Enclosure 1 to this letter.

In addition, Enclosure II of this letter provides Revision 1 to the subject amendment applications, submitted by the above reference, consisting of replacement pages to correct typographical errors and provide clarifications regarding Fuel Handling Building load conditions.

If you have any questions concerning spent fuel pool reracking or would like additional information, please let me know.

Very truly yours,

FRNandy

A001

Enclosures

cc: J. B. Martin, Regional Administrator, NRC Region V
F. R. Huey, NRC Senior Resident Inspector, San Onofre Units 1, 2 and 3

ENCLOSURE 1

ADDITIONAL INFORMATION

SPENT FUEL POOL RERACKING LICENSE AMENDMENT APPLICATIONS

SAN ONOFRE NUCLEAR GENERATING STATION

UNITS 2 AND 3

ADDITIONAL INFORMATION
SPENT FUEL POOL RERACKING LICENSE AMENDMENT APPLICATIONS
SAN ONOFRE NUCLEAR GENERATING STATION
UNITS 2 AND 3

1. Boraflex Wrapper Material

The Boraflex wrapper which positions the Boraflex on the side of a rack storage cell is made of Type 304 LN stainless steel, which is the same material as the racks. (See Sections 4.1.2.1.1, 4.1.2.1.2 and 4.7.1 of the "Spent Fuel Pool Reracking Report" March 1989 - Attachment E to the License Amendment Application Description and Safety Analysis.) The wrapper thickness is 0.020 inch as identified in Figures 3.1-1 and 3.1-2 of the "Spent Fuel Pool Reracking Report."

2. Corrective Actions if Boraflex is Found Degraded

The wrapper holds Boraflex in place on the side of a Westinghouse spent fuel rack storage cell without pinching, binding, sagging or buckling. By not pinning, bolting or using an adhesive to hold the Boraflex in place the Boraflex is allowed to shrink in response to the pool environment without developing thermal or irradiation induced stresses, thus minimizing the possibility of Boraflex cracking which has occurred in other racks in which the Boraflex was mechanically fixed to fuel storage racks. Boraflex cracking has not occurred at other facilities using the Westinghouse wrapper design.

SCE will follow the industry efforts concerning the performance of Boraflex. EPRI, Bisco (the manufacturer of Boraflex) and several utilities are analyzing data as it becomes available and will notify the industry of the results. SCE will evaluate these results and determine whether any additional actions are warranted for the San Onofre Units 2 and 3 spent fuel racks.

In addition, the following corrective action options to assure continued safe storage of fuel would be considered if unexpected degradation problems are detected:

1. The degraded Boraflex could be evaluated to determine whether the degradation and any expected future degradation would adversely affect the ability to satisfy the .95 k_{eff} limit for the spent fuel pool. If the pool could still satisfy this limit, no further action would be necessary.

2. Administrative controls could be imposed on the enrichment and/or burnup of fuel to be placed in or adjacent to storage cell locations that have degraded Boraflex to assure that the k_{eff} would remain less than or equal to the .95 k_{eff} limit.

3. A neutron absorbing material such as a control rod or burnable neutron absorber could be added to a fuel assembly to be placed in a storage cell with degraded Boraflex. This would reduce the k_{eff} to less than or equal to the .95 limit.

4. The storage cells with the degraded Boraflex could be blocked off to prevent loading of any fuel assembly into the cell.

5. Credit could be taken for the Technical Specification minimum of 2350 ppm soluble boron concentration in the spent fuel pool water with daily sampling (per Turkey Point ASLB Hearing testimony). This boron concentration would result in subcriticality even with a postulated significant loss of boron from the Boraflex.

3. Westinghouse Spent Fuel Racks Licensed in the U.S.A. With the Wrapper Design

Owners	Project Name
Alabama Power	J. M. Farley 1 and 2
Arkansas Power and Light	Arkansas 1 and 2
Carolina Power and Light	Shearon Harris 1, 2, 3 and 4
	H. B. Robinson
Consumers Power	Palisades
Duke Power	Oconee 1, 2 and 3
	McGuire 1 and 2
Florida Power and Light	Turkey Point 3
Georgia Power	A. W. Vogtle 1
Gulf States Utilities	River Bend 1
Houston Light and Power	South Texas 1 and 2
Northeast Utilities	Millstone 1 and 3
Philadelphia Electric Co.	Peach Bottom 2 and 3
Public Service of New Hampshire	Seabrook
South Carolina Electric and Gas	Virgil C. Summer
Tennessee Valley Authority	Sequoyah 1 and 2
	Bellefonte 1 and 2
Texas Utilities	Comanche Peak 1 and 2

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ENCLOSURE 2

REVISION 1 TO SPENT FUEL POOL RERACKING LICENSE AMENDMENT APPLICATIONS

SAN ONOFRE NUCLEAR GENERATING STATION

UNITS 2 AND 3

Replacement Pages to the Description and Safety Analysis and the "Spent Fuel Pool Reracking Licensing Report" - Attachment E to the Description and Safety Analysis both submitted by March 10, 1989 letter from Kenneth P. Baskin (SCE) to Document Control Desk (NRC).

Replacement Pages

To: Description and Safety Analysis

1. Page 2 - Corrected elevation 33 feet to 39 feet 10 inches.

To: Spent Fuel Pool Reracking Licensing Report

1. Figure 2.2-3 - Corrected top of racks height of 16 feet 6 1/2 inches to 16 feet 4 inches.
2. Page 4.6-13 - Corrected typographical error to include load combination 5.
3. Page 4.6-13 - Paragraph revised to provide clarification on the inclusion of load combination 5 in consideration of the limiting case.
4. Page 4.6-15 - Added formula for load combination 5 for use as limiting case. Deleted redundant note regarding dead loads and live loads.
5. Page 4.6-16 - Corrected seismic impact load at the grid spacer from 2110 pounds to 2142 pounds.
6. Page 4.6-20 - Added reference to Figure 4.6-10 for clarification.
7. Page 4.6-24 - Correct maximum drop weight to maximum drop height.
8. Page 4.6-25 - Text revised to clearly identify the spent fuel rack installation tolerance of 0.25 inches.

Note: Pages 4.6-13 to 4.6-27 are included because incorporation of the above changes resulted in text roll on several pages.

CEW:rplcpgs

INSTRUCTIONS FOR INSERTING REVISION 1

SPENT FUEL POOL RERACKING LICENSING REPORT

Revision 1 to the Spent Fuel Pool Reracking Licensing Report consists of insert pages.

The insert pages provide changes to the Licensing Report to clarify text and figures and are indicated by a bold line in the outside margin adjacent to the change. The date (4/89) and revision number (Revision 1) are provided at the bottom of each changed page and are also used to indicate pages that are changed due to relocation of text pages.

In addition:

The List of Effective Pages (LOEP-1) is to be placed in the manual behind the front cover.

Place Figure 4.6-1 in front of Figure 4.6-2.

Discard page 5.1-14 (Table 5.1-1) where footnote number 5 reads: "5. Date by which the high density racks would be filled." Retain Table 5.1-1 where footnote number 5 reads: "5. Last operating cycle which the high density racks maintain full core offload capability."

LIST OF EFFECTIVE PAGES

This List of Effective Pages identifies those text pages and figures currently effective in the Licensing Report.

This new Technical Specification will also define the conditions and storage patterns (checkerboard or alternating row) for which new or burned fuel, which does not meet the enrichment vs. burnup criteria for unrestricted storage in Region II, may be stored in Region II.

Lastly, this new Technical Specification will define the conditions (empty - alternating cells - empty) under which a new/burned fuel reconstitution station may be established in Region II.

4. Technical Specification 5.6.4 will be revised to designate that no more than 1572 fuel assemblies may be stored in the spent fuel racks which is an increase of 772 from the current limit of 800 elements.

5. Technical Specification 3.9.7 will be revised to list the following allowable lifts of heavy loads above stored spent fuel:

   A. Spent fuel pool gates shall not be carried at a height greater than 30 inches (elevation 36 feet 4 inches) over the fuel racks.

   B. Test equipment skid (4500 pounds) shall not be carried at a height greater than 72 inches (elevation 39 feet 10 inches) over rack cells which contain Unit 2 or 3 fuel assemblies or greater than 30 feet 8 inches (elevation 64 feet 6 inches) over rack cells which contain Unit 1 fuel assemblies. 1

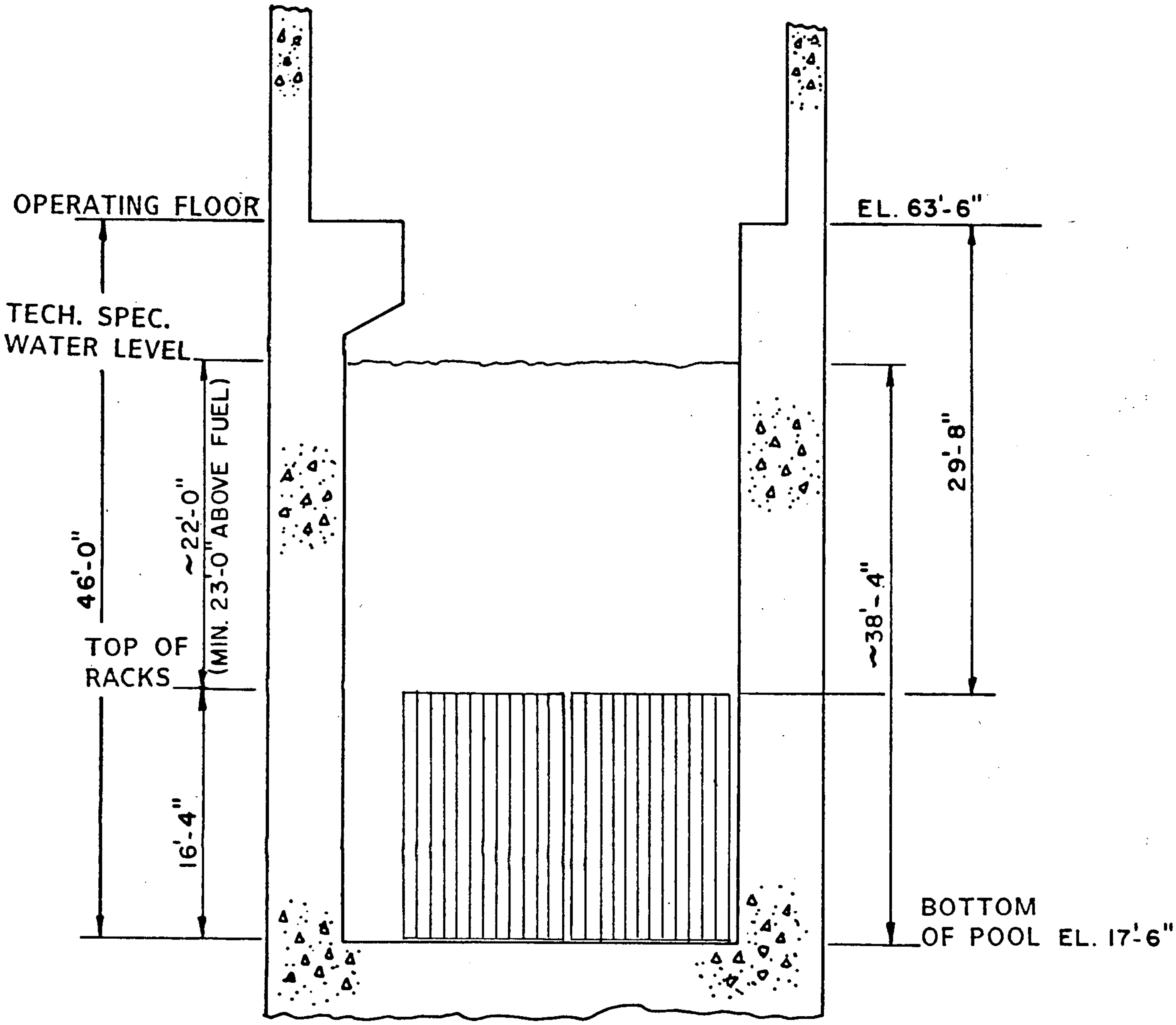
   C. Installation or removal of the cask pool cover over the cask pool with fuel in the cask pool.

   D. The lift of construction loads, the temporary gantry crane and the old and the new fuel storage racks (including lifting equipment and rigging), above the cask pool with the cask pool cover in place and fuel in the cask pool. This includes temporary storage of these construction loads on the cask pool cover during construction.

6. The basis for Specification 3.9.7 will be revised to reflect the analysis for the heavy load drops associated with the revised Specification 3.9.7.

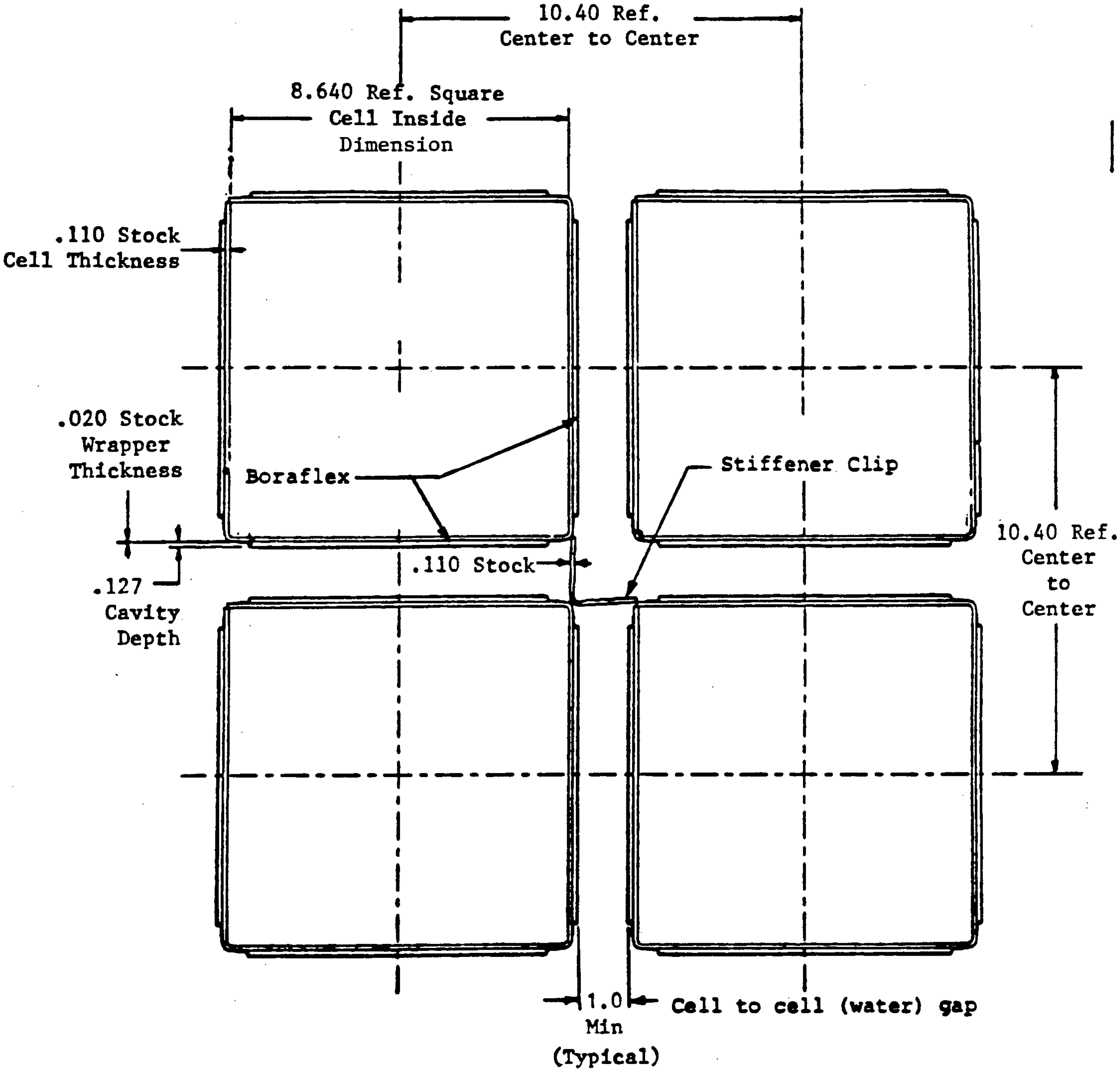
The detailed description of the proposed changes to the fuel storage racks and related operations plus the detailed bases for the acceptability of the changes and related operations are provided in Attachment E - "Spent Fuel Pool Reracking, San Onofre Nuclear Generating Station, February 1989."

SPENT FUEL POOL
(UNIT 2)



SECTION VIEW
LOOKING NORTH

SAN ONOFRE NUCLEAR GENERATING STATION Units 2 & 3
RACK LOCATION IN SPENT FUEL POOL
FIGURE 2.2-3

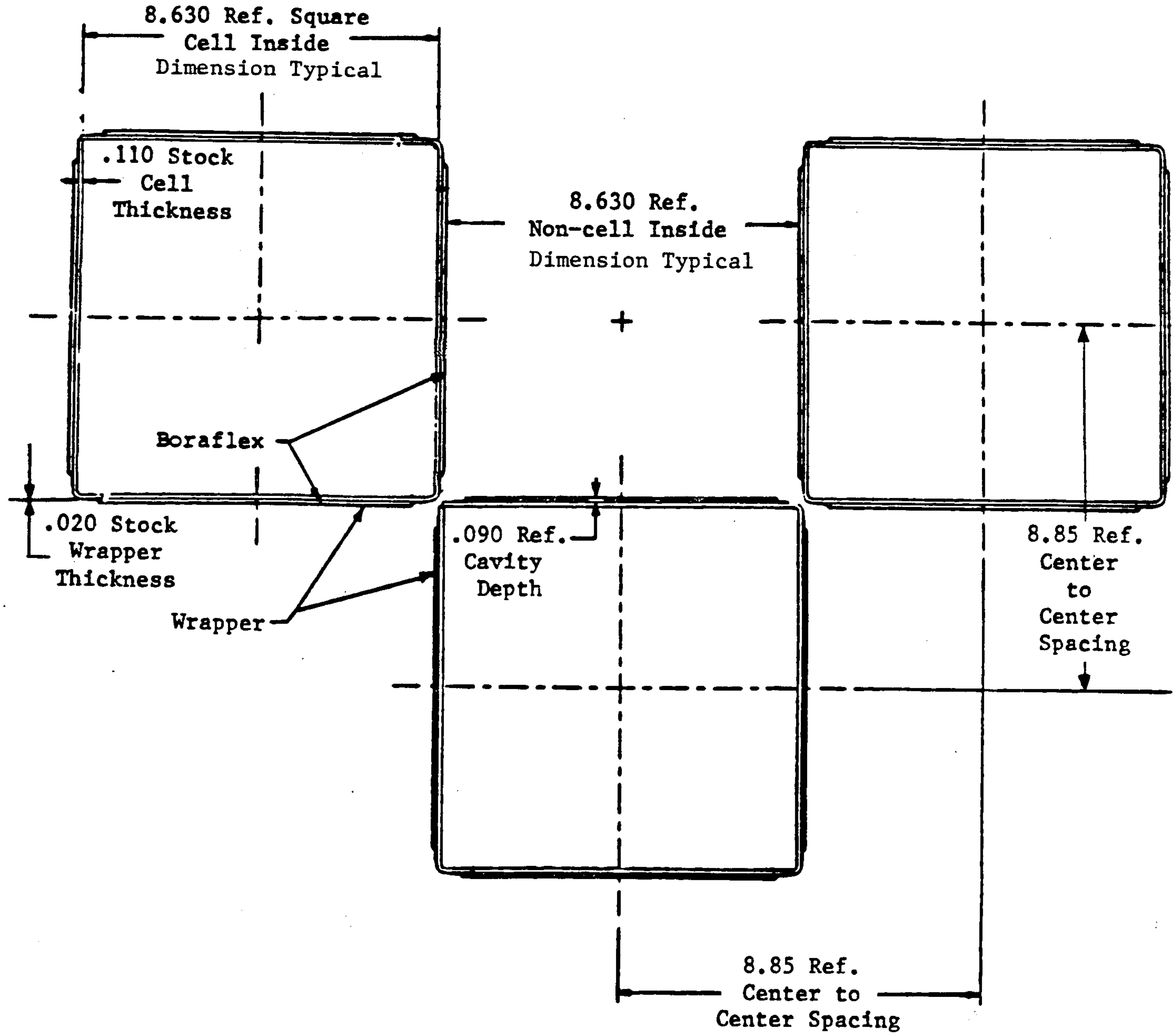


1

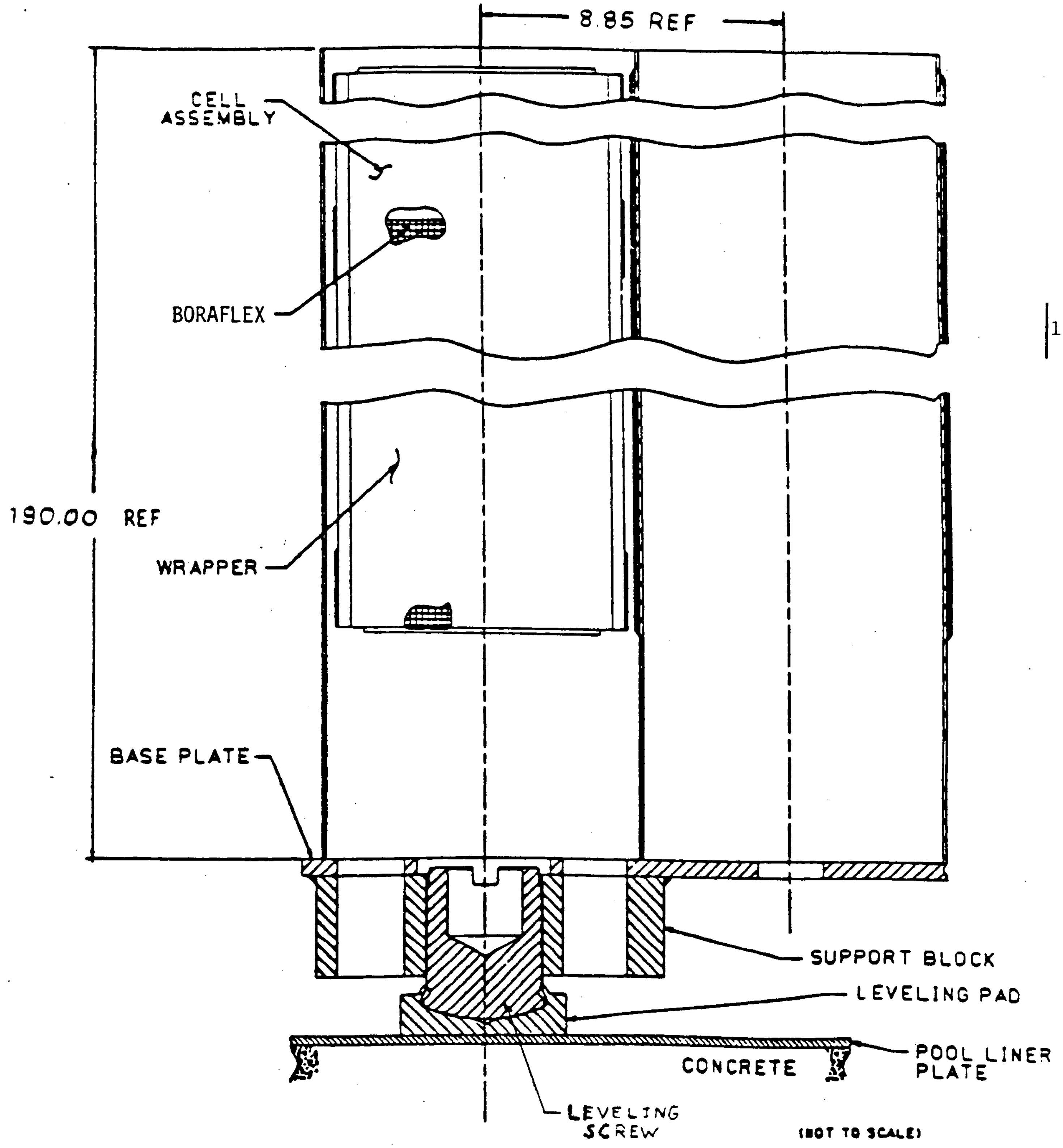
SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3

REGION I
CELL LAYOUT

FIGURE 3.1-1



SAN ONOFRE NUCLEAR GENERATING STATION Units 2 & 3
REGION II CELL LAYOUT
FIGURE 3.1-2



NOTE: LINER BRIDGE PLATES
NOT SHOWN

SAN ONOFRE
NUCLEAR GENERATING STATION
Units 2 & 3

REGION II RACK
CROSS-SECTION

FIGURE 4.1-4

1

Limit Analysis

Load Combination	Acceptance Limit
1. 1.7 (D+L)	NF 3340 of ASME
2. 1.3 ($D+L+T_o$)	Code Section III
3. 1.7 (D+L+E)	
4. 1.3 ($D+L+E+T_o$)	
5. 1.3 ($D+L+E+T_a$)	
6. 1.3 ($D+L+T_o+P_f$)	
7. 1.1 ($D+L+T_a+E'$)	

Abbreviations are defined in paragraph 4.4.2.1. Note that SRP 3.8.4 Appendix D lists XVII 4000 rather than NF 3340 for the acceptance limit. However, Appendix XVII has now been incorporated into Subsection NF and what was XVII 4000 is now NF 3340.

Margins to Allowable shown in tables 4.6-4 and 4.6-5 are for the limiting load combinations 3, 5, and 7. The Margin to Allowable 1 (MA) is calculated, as shown in equation form below, by comparing the acceptance limit with the applied load. The acceptance limit is the limit load of the structural component (see NF 3340 of ASME Code Section III), and the applied load is the factored load obtained from the load combinations specified above. Since the acceptance limit is the same for all seven load combinations, it is possible to meet the requirements of the load combinations by addressing three limiting combinations. Load combination 7 is 1 limiting because it is the only combination involving the DBE condition. Load combinations 3 and 5 are the limiting combinations of combinations 1 through 6 as shown in the following paragraphs. 1

Load combination 3 [1.7(D+L+E)] envelops load combination 1 [1.7(D+L)].

Load combination 5 [1.3(D+L+E+T_a)] envelops load combinations 2 [1.3(D+L+T_o)] and 4 [1.3(D+L+E+T_o)]. Since stresses caused by the stuck fuel assembly load condition (P_f) are much lower than stresses caused by the OBE (E), load combination 5 also envelops load combination 6 [1.3(D+L+T_o+P_f)].

The two columns on tables 4.6-4 and 4.6-5 are labeled OBE and DBE. The column labeled OBE is the MA for either load combination 3 [1.7(D+L+E)] or load combination 5 [1.3(D+L+E+T_a), whichever is the more limiting condition. Except where indicated 1
on the tables, load combination 3 [1.7(D+L+E)] is more limiting. The column labeled DBE is the MA for load combination 7 [1.1(D+L+T_a+E')].

The MA shown in tables 4.6-4 and 4.6-5 is defined as

$$MA = \frac{\text{Allowable Load}}{\text{Applied Load}} - 1 = \frac{\text{Limit Load}}{\text{Factored Load}} - 1$$

Specifically, for the two reported conditions:

OBE

where load combination 3 [1.7(D+L+E)] is limiting -

$$MA_{OBE} = \frac{\text{Limit Load}}{1.7(D+L+E)} - 1$$

where load combination 5 [$1.3(D+L+E+T_a)$] is limiting -

$$MA_{OBE} = \frac{\text{Limit Load}}{1.3(D+L+E+T_a)} - 1$$ 1

DBE

$$MA_{DBE} = \frac{\text{Limit Load}}{1.1(D+L+T_a+E')} - 1$$ 1

4.6.2.3 Results for Rack Analysis

Tables 4.6-4 and 4.6-5 show the minimum MA for the various components and welds on the SONGS racks. The adequate margin in each case shows that the racks meet the structural requirements of the ASME Code.

In addition, the impact loads on the fuel assemblies due to the interaction with the rack during a seismic event have been determined. The maximum calculated seismic impact load at a spacer grid location is 2142 pounds, which is less than the allowable spacer grid strength for the more limiting C-E 16 x 16 fuel assemblies(24). 1

4.6.3 SPENT FUEL HANDLING MACHINE (SFHM) UPLIFT ANALYSIS

An analysis was performed to demonstrate that a rack can withstand an uplift load of 6000 pounds produced by a jammed fuel assembly. Using worst geometry assumptions, the stresses resulting from this load were calculated and compared to the acceptance limits. This loading condition was determined not to be a governing condition and is covered by the results reported in tables 4.6-4 and 4.6-5 for the limiting loading combinations. In addition, since the gross stresses remained within the elastic regime, there is no change of rack cell geometry of a magnitude sufficient to cause the criticality acceptance criterion to be violated.

4.6.4 FUEL ASSEMBLY DROP ACCIDENT ANALYSIS

4.6.4.1 Statement of Problem

4.6.4.1.1 Drop Cases

Two cases were considered for the accidental drop of a fuel assembly onto or into the racks. These were:

A. Westinghouse 14 x 14 standard fuel assembly with control rods, total dry weight of 1260 pounds, dropped from a conservative height of 24.9 feet above the pool floor,

B. Combustion Engineering 16 X 16 fuel assembly with control rods, total dry weight of 1540 pounds, dropped from a conservative height of 21.7 feet above the pool floor.

4.6.4.1.2 Drop Orientations

Three orientations of drop were considered. These were:

A. Drop of an assembly onto the top of the racks with the assembly in a vertical position,

B. Drop of an assembly onto the top of the racks with the assembly in an inclined position, and

C. Drop of a fuel assembly through an empty cell to the bottom of the pool.

4.6.4.1.3 Acceptance Criteria

The acceptance criteria used were:

A. Fuel criticality does not occur, and
B. Perforation of the pool liner does not occur.

4.6.4.2 <u>Model Definition</u>

4.6.4.2.1 Assumptions for Energy Dissipation

For evaluation of the cases defined above, the following general assumptions for energy dissipation were made:

A. The fuel assembly falls freely in an infinite pool of static water with hydrodynamic drag being considered,

B. No energy is dissipated in the rack structure during the drop,

C. The pool liner and floor flexibilities are neglected. The only flexibilities considered are those component parts at the bottom (impact) end of the fuel assembly,

D. No energy is dissipated in the fuel rods, and

E. the kinetic energy of the fuel assembly is totally converted into strain energy of the assembly structure.

4.6.4.2.2 Assumptions for Drag Determination

The mathematical model used to evaluate the impact velocity was based on the following conservative assumptions:

A. The drag coefficient used was that for a flat plate normal to the flow direction. The minimum value found in the literature[10], which represents flow at high Reynolds numbers, was used and was taken as a constant for the entire drop event. This is conservative since the drag coefficient decreases as the flow velocity increases.

B. The minimum frontal area of the fuel assembly was used to determine the drag force.

Work-energy relationships were used to solve the nonlinear kinetic equation relating fuel assembly weight, buoyancy, velocity, and drag. The finite difference technique was used to integrate the drag force term. The increment size was varied to determine that the solution had converged properly.

4.6.4.3 <u>Drop Analysis Results</u>

4.6.4.3.1 Satisfaction of Criticality Criterion

Criticality calculations show that with 2000 ppm Boron in the fuel pool water (the normal condition is a minimum of 2350 ppm), fuel criticality does not occur. Thus, for the fuel drop accident the presence of the Boron ensures that the criticality criterion is satisfied for all cases.

4.6.4.3.2 Satisfaction of Pool Liner Integrity Criterion

Drop orientations A and B are considered together since the same philosophy covers both cases. For these cases, either the fuel assembly will remain on top of the racks after impact or will impact the pool floor with a lower velocity than the drop through case since part of the potential energy will be absorbed by the initial impact with the top of the rack. Therefore, perforation of the pool liner is enveloped by the case of drop of a fuel assembly through a cell.

Each of the three cases (see paragraph 4.6.4.1.2) was evaluated to determine the velocity of impact with the pool liner. In each case the structure at the lower end of the assembly, i.e., bottom nozzle, guide tubes, etc., had enough strain energy capacity to absorb the drop kinetic energy. When consideration was given to the "footprint" of the dropped assembly, the stresses imposed on the pool liner were determined to be 43% of the ASME Code Allowable Limit for Faulted Conditions. The pool liner will therefore not be perforated for any of the drop accidents.

4.6.5 OTHER EQUIPMENT DROP ANALYSIS

There were two types of analyses performed for drops onto the SFP racks (see figure 4.6-10). The first analysis postulated a drop of the SFP gate. The second analysis examined a drop of test equipment load. These analyses are discussed below. 1

A. Spent Fuel Pool Gate Drop Load Analysis

Evaluation of a pool gate drop was based on a drop height of 30 inches above the top of the rack. This height is administratively controlled by permitting a maximum vertical clearance of 10 inches between the bottom of the gate and the bottom ledge of the gate opening until gate is laterally moved clear of the SFP. The dimensions of the gate are 41.0 x 343.5 x 0.75 inches. The weight of the gate is 4500 pounds.

The maximum penetration occurs for the case when the gate impacts the rack at 45°. The resulting penetration depth is 21.2 inches. This results in potential fuel damage in six cells.

The amount of penetration was determined from "conservation of energy"; i.e., the energy absorbed through plastic deformation of the rack was equated to the change in potential energy of the gate. Because all the deformation was assumed to occur in the rack and drag due to water was ignored, a conservative upper bound on the penetration was determined.

Energy absorbed by the rack was based on a "knife-edge" penetration of the cell wall. Because the gate thickness is only 0.75 inches, the force to initiate this type of penetration is significantly less than any other mode of penetration. The absorbed energy was calculated by conservatively assuming perfectly plastic deformation at a load which results in a shear stress equal to 57% of the minimum compressive yield strength of the cell wall. The impact location was selected such that the maximum number of fuel assemblies was affected.

These calculations were done for a Region II rack. This region is limiting because it has only one cell wall between adjacent storage locations, whereas Region I has two cell walls between adjacent storage locations.

A drop analysis was also performed for the SFP gate impacting the pool floor liner. The analysis assumed a drop height of 50 feet 6 inches (from 4 feet 6 inches above the pool deck) and evaluated the consequences on the pool floor liner system and the basemat concrete. The results of that analysis are bounded by the rack drop results presented in paragraph 4.7.4.4. The radiological consequences of this drop are presented in subsection 5.3.6.

B. Test Equipment Load Drop Analysis

The test equipment load drop analysis assumes the drop of a 4500 pound piece of equipment from a height of 47 feet above the pool floor [administratively controlled to be 1 foot above the operating floor (elevation 64 feet 6 inches)]. The test equipment consists of a 4-foot by 6-foot base with a 200-inch long vertical H-beam attached to the base at one of the 4-foot edges. Additional equipment is attached to both the base and the H-beam. The height of the water in the pool during the drop accident is assumed to be 40 feet. Therefore, the equipment will fall 7 feet and then enter the water. Then the equipment will fall through the water until it impacts the tops of the racks which are at 16 feet 4 inches above the pool floor. Some conservative drag calculations were made for this piece of equipment. These resulted in the equipment impacting the top of the racks with a velocity of approximately 206 in/s. The kinetic energy of the equipment is then converted into strain energy in the rack structure.

Calculations were made to determine the load required to compress a fuel rack cell. As the cell is displaced the load on the cell will rise. At some point the sides of the cell will locally buckle. This does not result in collapse of the cell but only means that the cell walls function at a reduced effective width. Beyond this point the load will still rise but at a slower rate than before the cell walls locally buckle. When the yield point of the cell is reached then the local buckling increases rapidly and the load the cell can withstand decreases to a lower value. Then the cell load decreases very slowly as the cell is compressed. The penetration into the rack top if the equipment base is conservatively assumed to be at an angle with the horizontal of 45° when it impacts the rack was calculated. The maximum penetration in this case is approximately 16 inches.

The top of the Unit 1 fuel assembly is approximately 51.5 inches below the top of the rack. Therefore, this drop will not result in damage to Unit 1 fuel assemblies. The top of the Units 2 and 3 fuel assemblies is approximately 13.2 inches below the top of the rack and this drop would result in damage to 14 Units 2 and 3 fuel assemblies. An additional analysis was made to determine the maximum drop height under which no fuel assembly damage results. It was determined that for a drop height of 72 inches above the top of the rack the test equipment will impact the top of the rack with a velocity of 177 in/s. The penetration into the rack top if the equipment base is conservatively assumed to be at an angle with the horizontal of 45° when it impacts the rack was calculated. The maximum penetration in this case is 13.0 inches. The top of the Units 2 and 3 fuel assembly is approximately 13.2 inches below the top of the rack. Given the drop penetration of 13 inches no fuel damage occurs.

These calculations were done for a Region II rack. Since this type of rack has only one cell wall between adjacent storage locations and the Region I rack has two cell walls between adjacent storage locations, the Region II rack is the limiting case.

Administrative controls will be implemented to provide assurance that the radiological consequences of these drops are acceptable. The administrative controls are presented in subsection 5.3.5.

The drop of the test equipment onto the SFP floor was investigated. It has been shown that the results of such a postulated event would be bounded by the rack drop analysis presented in paragraph 4.7.4.4.

4.6.6 RACK DISPLACEMENTS

From the nonlinear time history analysis, the maximum Region I rack displacement (absolute displacement) was determined to be 1.80 inches in the east-west direction and 1.50 inches in the north-south direction. For the Region II racks, the maximum displacement was determined to be 1.39 inches in the east-west direction and 1.44 inches in the north south direction. The remaining rack to pool wall gap is calculated by taking the nominal initial clearance between the rack and the pool wall and then subtracting the installation tolerance (0.25 inches),

fabrication tolerance, total thermal growth of one rack (0.10 1
inches), and the seismic displacement of the rack. The minimum remaining rack to pool wall gap is determined to be 1.90 inches and is based on the nominal initial rack to wall gap of 3.75 inches in the north-south direction for a Region I rack and the seismic displacement of 1.50 inches (table 4.6-6). It is noted that the maximum displacement of 1.80 inches for Region I east-west direction does not produce the minimum pool wall gap because of the large (11.10 inches) nominal initial clearance.

The most limiting relative displacement between racks as determined from the time history results is 1.39 inches. (A larger relative displacement of 1.73 inches occurs in the east-west direction between the two Region I racks. However, the gap between these racks is large and this case is not limiting.) Using the appropriate nominal initial clearance between racks of
3.44 inches and then subtracting the installation tolerance (0.25 1
inches), fabrication tolerance, thermal growth of two racks (0.20 inches total due to 0.10 inches per rack), pool construction tolerances (which may reduce rack to rack gaps a maximum of 0.34 inches), and the seismic relative displacement between racks (1.39 inches), the remaining rack to rack gap is determined to be 1.26 inches (table 4.6-6).

From these results it is concluded that the racks are spaced with sufficient clearance so that rack to rack and rack to pool wall impact does not occur.

Also extracted from the time history results is the maximum support pad vertical displacement (lift-off). The maximum support pad lift-off is found to be 0.23 inches. For this magnitude of pad lift-off the factor of safety against rack overturning is determined to be greater than 48 which satisfies the requirements of Section 3.8.5.II.5 of the SRP.

4.6.7 RACK LOCATION VERIFICATION

The applicable plant procedures which govern activities after a seismic event will be revised to include a requirement to perform a walkdown of the SFP to check the rack configuration. This walkdown will be performed after confirmation of an OBE event.