D. SAFETY ANALYSIS OF THE PROPOSED TECHNICAL SPECIFICATION AMENDMENT

The proposed amendment to Sections 3.9.6 and 4.9.6.1 would revise the refueling machine overload cut off limit to be appropriate for the increase in the fuel assembly weight. The increase in the fuel assembly weight results from modifications which include denser fuel pellets, laser welded GUARDIAN™ grids, and laser welded spacer grids. The following is a brief description of these modifications:

Denser Fuel Pellets - The fuel pellet was physically modified which resulted in a slightly larger outside diameter, with a reduced dish volume and reduced chamfer height to provide more energy per unit volume and reduce the propensity of end capping and chipping.

Laser Welded GUARDIAN™ Grids - The previous Inconel Grid Assembly is replaced with a redesigned Inconel Spacer Grid Assembly called the GUARDIAN™. The GUARDIAN™, with its design features, improves the Inconel spacer grid assembly's ability to entrap debris.

Laser Welded Spacer Grids - The spacer grid assemblies were redesigned to improve the coolant flow between the fuel rods located along the periphery of the fuel bundle. Laser welding also produces a smaller and more uniform nugget. This smaller weld nugget reduces the grid's pressure drop coefficients thereby producing greater thermal margin.

These modifications were evaluated, separate from this proposal, and found to be acceptable in accordance with the provisions of 10 CFR 50.59. The weight of the fuel is not identified in the Technical Specifications.

The overload cut off limit was incorporated on the refueling machine hoist to protect the core internals and pressure vessel from possible damage in the event the fuel assembly becomes mechanically bound as it is withdrawn from the reactor vessel. The proposed overload cut off limit was determined as follows:

Overload Cut Off limit = (Hoist Wet Weight) + (Grapple Wet Weight) + (Max Wet Fuel Weight) + 90 lbs.

Where: a) Hoist and Grapple Wet Weight = 176 lbs.
b) Maximum Wet Fuel Weight = 1334 lbs.

The basis for the 90 pounds had two considerations: (1) to be large enough to account for friction loads during fuel assembly withdrawal; and, (2) to be small enough to ensure that while lifting a minimum weight fuel assembly, the loads

imposed on a mechanically bound fuel assembly are below the design limit specified by the fuel manufacturer. The maximum value for the existing overload cut off limit was specified by the fuel manufacturer to be 1602 pounds. There is some conservatism in the calculation of the 1602 pound upper limit since the fuel manufacturer's calculation is based on fuel assemblies with a 14 x 14 pin arrangement where Palo Verde fuel assemblies have a 16 x 16 pin arrangement, which contains more welds. There are approximately 15% more welds, especially along the periphery, of fuel assemblies with a 16 X 16 pin arrangement. The additional weld geometry was reviewed and estimated to allow the increase of the maximum value for the overload cutoff limit by 20 pounds (i.e., up to 1622 pounds). However, since the proposed 1600 pound overload cut off limit is bounded by the fuel manufacturer's existing maximum value of 1602 pounds, the use of this conservatism was not necessary.

In order to prevent challenging of the overload cut off, the refueling machine normal operating procedures caution the operator to stop the hoist if the indicated load exceeds a prescribed administrative limit. The administrative limit is more restrictive than the proposed overload cutoff limit. The fuel assembly grids have also been designed with lead-in features to minimize the potential for mechanical binding. The revised overload cut off limit does not decrease the factor of safety for the refueling machine hoist below the Crane Manufacturer's Association of America (CMAA) Standard 70 required value of 5/1.

Based upon the above it can therefore be concluded that the integrity of the fuel assemblies, core internals and the pressure vessel will be maintained with the proposed change.

## E. NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves no significant hazards consideration, if operation of the facility in accordance with a 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. A discussion of these standards as they relate to this amendment request follows:

**Standard 1** -- Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

The proposed Technical Specification amendment to Sections 3.9.6 and 4.9.6.1 provides a revised refueling machine hoist overload cut off limit that is appropriate

for the increased weight of the fuel assemblies. The increased weight of fuel assemblies results from design and fabrication improvements such as denser fuel pellets, laser welded GUARDIAN™ grids, and laser welded spacer grids. The weight of a fuel assembly is identified in the UFSAR as a parameter in the analysis for a Fuel Handling Accident. The radiological consequences of a Fuel Handling Accident were re-evaluated in order to incorporate fuel assembly design changes including increases in the fuel assembly weight and increases of the maximum fuel enrichment. The analysis used a fuel assembly enriched to 4.3 weight percent and the power assigned to the assembly was 1.65 times the average power per assembly. The accident is assumed to occur 100 hours after reactor shutdown and it is also assumed that all 236 fuel rods fail. The resultant thyroid dose at the 2 hour exclusion area boundary is 71.5 rem which meets the Standard Review Plan 15.7.4 limit of 75 rem. The conclusions for the radiological consequences of a Fuel Handling Accident remain consistent with the results in the Safety Evaluation Report. The increased weight of the fuel assemblies was reviewed, separate from this proposal, in accordance with the provisions of 10 CFR 50.59 and found to be acceptable, as described above.

The increase in the refueling machine overload cut off limit does not impact the manner in which the refueling machine is operated or the manner in which the fuel assemblies are engaged and lifted. The overload cut off limit is not a parameter used in the analysis of a Fuel Handling Accident. The overload cut off limit was incorporated on the refueling machine hoist to protect the core internals and pressure vessel from possible damage in the event the fuel assembly becomes mechanically bound as it is withdrawn from the reactor vessel. The proposed overload cut off limit was determined as follows:

Overload Cut Off limit = (Hoist Wet Weight) + (Grapple Wet Weight) + (Max Wet Fuel Weight) + 90 lbs.

Where:
a) Hoist and Grapple Wet Weight = 176 lbs.
b) Maximum Wet Fuel Weight = 1334 lbs.

The basis for the 90 pounds had two considerations: (1) to be large enough to account for friction loads during fuel assembly withdrawal; and, (2) to be small enough to ensure that while lifting a minimum weight fuel assembly, the loads imposed on a mechanically bound fuel assembly are below the design limit specified by the fuel manufacturer. The maximum value for the existing overload cut off limit was specified by the fuel manufacturer to be 1602 pounds.

The revised overload cut off limit does not decrease the factor of safety for the refueling machine hoist below the Crane Manufacturer's Association of America (CMAA) Standard 70 required value of 5/1.

Therefore, the proposed change for the refueling machine overload cut off limit will not significantly increase the probability or consequences of an accident previously evaluated and will remain bounded by the accident analysis of Chapter 15 of the Updated Final Safety Analysis Report (UFSAR).

**Standard 2** -- Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

The proposed Technical Specification amendment to Sections 3.9.6 and 4.9.6.1 would provide a revised refueling machine hoist overload cut off limit that is appropriate for the increased weight of the fuel assemblies. The increased weight of fuel assemblies results from design and fabrication improvements such as denser fuel pellets, laser welded GUARDIAN™ grids, and laser welded spacer grids. The fuel overload cut off limit was incorporated on the refueling machine hoist to protect the core internals and pressure vessel from possible damage in the event the fuel assembly becomes mechanically bound as it is withdrawn from the reactor vessel. The proposed overload cut off limit was determined as follows:

Overload Cut Off limit = (Hoist Wet Weight) + (Grapple Wet Weight) + (Max Wet Fuel Weight) + 90 lbs.

Where: a) Hoist and Grapple Wet Weight = 176 lbs.
b) Maximum Wet Fuel Weight = 1334 lbs.

The basis for the 90 pounds had two considerations: (1) to be large enough to account for friction loads during fuel assembly withdrawal; and, (2) to be small enough to ensure that while lifting a minimum weight fuel assembly, the loads imposed on a mechanically bound fuel assembly are below the design limit specified by the fuel manufacturer. The maximum value for the existing overload cut off limit was specified by the fuel manufacturer to be 1602 pounds to limit the potential for damage to the fuel assemblies.

The accident of concern related to the change in the refueling machine overload cut off limit is the Fuel Handling Accident. This accident occurs when a fuel bundle becomes disengaged from the refueling machine grapple. The change of the refueling machine overload cut off limit does not change the way in which the refueling machine grapple engages the fuel assemblies. Since fuel handling is the subject of the change, no new or different kinds of accidents are created.

Therefore, it can be concluded that the proposed change to Sections 3.9.6 and 4.9.6.1 will not create the possibility of a new or different kind of accident from any accident previously evaluated.

**Standard 3** -- Does the proposed change involve a significant reduction in a margin of safety.

The proposed Technical Specification amendment to Sections 3.9.6 and 4.9.6.1 would provide a revised refueling machine hoist overload cut off limit that is appropriate for the increased weight of the fuel assemblies. The increased weight of fuel assemblies results from design and fabrication improvements such as denser fuel pellets, laser welded GUARDIAN™ grids, and laser welded spacer grids. The overload cut off limit was incorporated on the refueling machine hoist to protect the core internals and pressure vessel from possible damage in the event the fuel assembly becomes mechanically bound as it is withdrawn from the reactor vessel. The proposed overload cut off limit was determined as follows:

Overload Cut Off limit = (Hoist Wet Weight) + (Grapple Wet Weight) + (Max Wet Fuel Weight) + 90 lbs.

Where: a) Hoist and Grapple Wet Weight = 176 lbs.
b) Maximum Wet Fuel Weight = 1334 lbs.

The basis for the 90 pounds had two considerations: (1) to be large enough to account for friction loads during fuel assembly withdrawal; and, (2) to be small enough to ensure that while lifting a minimum weight fuel assembly, the loads imposed on a mechanically bound fuel assembly are below the design limit specified by the fuel manufacturer. The maximum value for the existing overload cut off limit was specified by the fuel manufacturer to be 1602 pounds.

The overload cut off limit is not a parameter used in the analysis of a Fuel Handling Accident. The conclusions regarding the radiological consequences of the Fuel Handling Accident remain valid, and there is no decrease in the margin of safety.

Therefore, it can be concluded that the proposed change will maintain the integrity of the fuel assemblies and reactor vessel internals and does not involve a significant reduction in the margin of safety.