Appendix 7 Safeguards Considerations

NEED DISCUSSION BY SAFEGUARDS IN PAPER

1) Explanation of Safeguards Rulemaking - What Is Included? - What Is Proposed? How does the TWG study fit in?

2) What is the relationship of Safeguards to risk? (I.E., SAFEGUARDS REQUIRED REGARDLESS OF RISK)

3) Why is safeguards not modeled in PRA?

Licensees with a 10 CFR Part 50 license are required to comply with 10 CFR 73.55, "Requirements for physical protection of licensed activities in nuclear power reactors against radiological sabotage." Decommissioning plants maintain the Part 50 license while spent fuel is stored in the spent fuel pool or until a Part 72 license is granted. An act of sabotage in the spent fuel pool area could potentially damage the fuel, storage racks, support systems, or the pool structure itself. A plant's safeguards material is sensitive information and cannot be released to the public. However, some of the scenarios and consequences occurring as a result of an act of sabotage can be evaluated. The staff evaluated a spectrum of spent fuel pool accidents including loss of cooling, loss of inventory, cask drop, and a seismic event. The loss of cooling and loss of inventory could be initiated from an act of sabotage. Likewise, an act of sabotage that fails the structural integrity of the spent fuel pool could be similar to a structural failure due to a cask drop or seismic event.

Scenarios Included in TWG Study:

A complete loss of water could result from a sabotage act that would crack the pool. If the fuel was damaged or if it remained intact and a sufficient decay heat existed such that a zirconium fire were to occur, the consequences would be bounded by the study.

If a sabotage act damaged the upper portion of the pool such that a drain down in the upper 20 feet of the pool occurred. The scenario would be similar to the a partial draindown due to a siphon event, which was evaluated by the staff. A siphon event could make the spent fuel pool drain a portion of the water in a fairly short timeframe. This would decrease the time for the remaining water to boil. If action to restore level was not taken, further draindown could occur. This could lead to fuel uncovery which was evaluated in this study.

An act of sabotage to the spent fuel pool cooling system would be bounded by the loss of coolant scenario in this study. Additionally, licensees describe in the safety analysis report the time required to reach boiling and the time to reach the top of the fuel if a loss of cooling were to occur. For decommissioning plants, the time needed to boil the pool water increases as the time since final shutdown increases. The decay power (i.e., heat source) in the spent fuel is decreasing, and if no other fuel is added to the pool, the decay power continues to decrease with time. Therefore, the likelihood of this scenario effecting the fuel decreases over time.

If an act of sabotage damaged the fuel but the pool remained intact, any damaged fuel would remain covered by approximately 23 feet of water which would provide sufficient shielding. If

some water was lost in the blast, generally over 13 feet of water would be needed to lost to cause a radiological concern to the worker. No concern would exist for the public.

Scenarios not bounded by the study would include acts that result in fuel pieces being scattered outside of the pool. The offsite dose consequences to the public would not exceed the dose from a zirconium fire. However, worker exposure could be an issue of concern.

From this study, equipment important to maintain the safety of the fuel has been identified and will be provided to the NRC Safeguards Branch for further consideration.