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NRC ISSUES AUGMENTED INSPECTION TEAM REPORT
ON HYDROGEN GAS BURN IN SPENT FUEL CASK AT POINT BEACH PLANT

The Nuclear Regulatory Commission Augmented Inspection Team has issued its report on the hydrogen gas burn which occurred May 28 in a spent fuel storage cask at the Point Beach Nuclear Power Station.

An exit meeting with the utility, open to the public, was held June 7 at the Two Creeks Town Hall to present the preliminary findings of the team. The report's conclusions are consistent with those presented at the June 7 meeting.

Among the principal findings of the team's report are:

- There was no evidence of damage to the spent fuel as a result of the gas burn and no measurable releases of radioactivity as a result of the gas burn.
- The source of the hydrogen was a chemical reaction between a zinc-based coating and the borated water from the spent fuel storage pool.
- Opportunities were missed to identify the potential generation of hydrogen during the initial design, design review, and design specifications for the spent fuel cask.
- The utility had several opportunities to identify the production of hydrogen during previous cask loading activities when abnormalities were noted. These abnormalities were not documented and were not thoroughly evaluated.

The Augmented Inspection Team's function was to gather information rather than determine compliance with NRC requirements. The team's findings will be reviewed during subsequent NRC inspections to assess the utility's regulatory compliance.

The executive summary of the AIT report is attached. Copies for the 29-page report are available from the Region III Office

of Public Affairs upon request.

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NRC AUGMENTED INSPECTION TEAM REPORT - EXECUTIVE SUMMARY

On May 28, 1996, after loading a VSC-24 ventilated storage cask with spent fuel, an unanticipated hydrogen gas ignition occurred inside the cask during welding of the shield lid. The gas ignition, which was heard by plant technicians, displaced the shield lid in the upward direction approximately 3 inches, and cocked it at a slight angle. The shield lid is approximately 9 inches thick, 5 feet in diameter, and weighs slightly less than 6,400 pounds.

There was no evidence of damage to the spent fuel in the cask as a result of the gaseous ignition. The Augmented Inspection Team (AIT) concluded that there were no offsite radiological consequences as a result of this event. During this event, all possible station release pathways to the public were monitored with no indication of abnormal releases. The AIT further concluded that there were no measurable releases of radioactivity from the cask and no unanticipated radiation exposures to the staff. There were no personnel injuries.

The licensee's actions during and following the event including management oversight were good. However, the inspectors identified several weaknesses in unloading procedures, safety evaluations, corrective actions and rigging practices.

The licensee has concluded and the AIT agrees, that the source of the hydrogen was an electrochemical reaction of zinc in the Carbo Zinc 11 coating when in contact with the borated water in the spent fuel pool (SFP). The coating is used to prevent corrosion of the multi-assembly sealed basket (MSB). At the conclusion of the AIT inspection the licensee had not fully completed their root cause investigation. However, the licensee believes that opportunities were missed to identify that the electrochemical reaction of the coating with borated water would result in the generation of hydrogen. Those opportunities occurred during the initial design, design review and design specification for the VSC-24 cask.

In addition, the AIT concluded that the licensee had several opportunities to identify the generation of gas inside of the MSB during previous cask loading operations due to several noted abnormalities. However, the abnormalities were not documented, were not thoroughly evaluated, and were not viewed collectively. This is of particular concern because the licensee had direct indications that combustible gas was being produced.

The AIT determined that the potential generic implications of the event extend beyond the use of the VSC-24 system. Consideration

should be given to reviewing the adequacy of the chemical compatibility evaluations conducted during design reviews for all dry cask storage designs. Consideration should also be given to determining the suitability of Carbo Zinc 11 and other similar coatings used in nuclear applications, where there is the potential to expose them to boric acid.

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