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FACIL:50-397 WPPSS Nuclear Project, Unit 2, Washington Public Powe 05000397
AUTH.NAME AUTHOR AFFILIATION
BOUCHEY,G.D. Washington Public Power Supply System
RECIP.NAME RECIPIENT AFFILIATION
SCHWENCER,A. Licensing Branch 2

SUBJECT: Comments on problematic & questionable necessity of using heat load w/UHS.Benefits of UHS confirmatory testing w/heat load do not justify attendant safety risks.Spray pond test scope encl.

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Washington Public Power Supply System
P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

June 11, 1982
G02-82-536

Docket No. 50-397

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commisssion
Washington, D.C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PROJECT NO. 2
ULTIMATE HEAT SINK TESTING

Reference: Letter G02-82-297, G.D. Bouchey (SS) to A. Schwencer (NRC), "Standby Service Water System", dated March 5, 1982

The Supply System committed in the referenced letter to perform a confirmatory test of the ultimate heat sink with a heat load. Further discussions with NRC staff (Dr. R. Codell) have identified complications that make use of a heat load problematic and of questionable necessity.

For specific operating parameters (flow rate, drop size spectrum, height of the spray, etc.) drift loss from spray ponds is primarily a function of wind speed, and it is important to assure in the confirmatory testing that relatively high winds will be present. In the Hanford area, spring is the season having the most consistent occurrence of relatively high winds. Since the confirmatory testing is to satisfy concerns related to drift loss, it is most likely that testing during the spring would provide the desired wind speed range in the data.

The effect of heat load on spray pond drift is reduced the higher the wind speed. As wind speed increases, the density difference between the air exiting the sprays and the ambient is diminished. This results in a reduction of bouyancy induced vertical air velocities with increased wind speed. Heat load, therefore, becomes less important as a contributor to drift loss as the wind speed increases.

Heat load testing would require elevation of the spray pond temperature above the technical specification limit of 77°F. Operation above this limit would require significant safety analyses and special consideration by the NRC. These safety analyses would be complicated by the WNP-2 power generation history which affects the amount of decay heat to be dissipated should an accident occur during elevated pond temperature testing.

B001

The Supply System does not believe that the benefits of Ultimate Heat Sink confirmatory testing with a heat load justify the attendant safety risks and associated costs of performing the tests with an elevated pond temperature. Since it is the intent of our confirmatory testing to acquire data at higher wind speeds (in the range above 10 mph), the Supply System does not feel that a heat load is necessary to achieve the objectives of the testing.

Very truly yours,

G. D. Bouchey
Deputy Director, Safety and Security

DM/jca
Attachment

cc: R Auluck - NRC
WS Chin - BPA
R Codell - NRC
R Feil - NRC Site

SPRAY POND TEST SCOPE

INTRODUCTION

Testing was done on the WNP-2 spray ponds in the summer of 1979. However, these tests were considered inconclusive by the NRC in determining the drift loss rate for the spray ponds. More testing is required by the NRC to better identify the drift loss rates at higher wind speeds. Commitments were made by the Supply System to perform the tests with a heat load; however, complications have risen that would make the use of a heat load problematic. The best time to perform the testing would be during the power ascension test program since the pond temperature would rise during testing above 77° F, which is the technical specification limit for full power operation. However, power ascension is scheduled to occur during the winter of 1983 which does not coincide with the period of high wind speeds (Spring). In addition to this scheduling consideration, the effect of heat load on spray pond drift decreases as wind speed increases. Since the intent of the testing is to determine drift at higher wind speeds, the Supply System does not feel a heat load is necessary. The lack of heat load requirement adds considerable flexibility in performance of the testing, and will allow the proper focus on drift data at higher wind speeds.

TIME OF TESTING

The testing should be performed during a period of high average winds (Spring) to obtain the drift rate at higher wind speeds than were encountered in the 1979 tests. The Spring of 1983 or 1984 are likely times depending on status of required systems and manpower availability.

DURATION

The test period should last 3 days in order to get enough data with varied wind speeds to determine the draft rate over as wide a range as possible. Since the average wind speed is highest in the afternoon hours, data should be taken 12 hrs./day during the daylight hours (0800-2000 hours). For testing 12 hrs./day, about three people would be required: 1 engineer and 2 technicians. Preparation for testing including set-up and calibration of equipment will take about two weeks.

DRIFT LOSS RATE DETERMINATION

From the review of spray pond test reports from other utilities, five methods of determining drift loss rates were found. These methods were analyzed for accuracy and ease of determining drift loss. The deposited solids method relies on the concentration of minerals in the drift. This method is only effective in areas of high mineral content in the circulating water (not the case for WNP-2 spray pond). Two other methods use water sensitive papers placed around the pond to determine the amount of drift. These papers need to be placed downwind which can be hard to determine ahead of time. The papers are also very easily overexposed which leads to problems with near-instantaneous data acquisition. The fourth method uses volumetric catchpans placed downwind to collect the drift. Problems arise with placement of the catchpans, exposure time, and the possibility of drift blowing over the top. The difference method determines all losses except drift (spray evaporation, surface evaporation, and leakage). These

items are then subtracted from the total water loss in the pond to provide the drift loss.

Evaluation of these methods led to the selection of the difference method. The other methods have technical problems and were not considered to add enough to drift determination to be justified.

DRIFT LOSS INSTRUMENTATION

The instrumentation required for the difference method includes:

1. hook gauges for pond level requirements (2);
2. evaporation pans with fixed hook gauges (2);
3. RTDs for measuring water temperatures (24);
4. pressure indicators for header and nozzle pressures (5);
5. flow indicators for header inlet flow rate (2);
6. meteorology stations (2) including:
    a. dry bulb temperature;
    b. wet bulb temperature;
    c. wind speed;
    d. wind direction.

The attached diagram shows the proposed locations for this instrumentation.

The drift and meteorological data will be recorded on a data logger system.

The testing will consist of six tasks:

1. Test specification
2. Set-up test
3. Take data
4. Data reduction
5. Report preparation
6. Report review

Spray Pond Instrumentation