TOLEDO EDISON

Richard P. Crouse
Vice President
Nuclear
(419) 259-5221

Docket No. 50-346

License No. NPF-3

Serial No. 1-179

January 5, 1981

Mr. James Keppler
Regional Director, Region III
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, Illinois 60137

Dear Mr. Keppler:

This letter is in response to IE Bulletin 80-24 dated November 21, 1980, (Log 1-446) as applicable to Davis-Besse Nuclear Power Station. Attached is Toledo Edison's required 45-Day response to the items of the Bulletin.

As requested by your letter, the following are estimates of the manpower expenditures in association with this Bulletin:

Review, Testing, Preparation of Report - 120 manhours

Corrective Action - 40 manhours (projected)

Yours very truly,

RPC/TDM/JWM/lrb

Attachments

cc: NRC DB-1 Resident Inspector

Director, NRC Office of Inspection and Enforcement
Washington, D. C. 20555

Docket No. 50-346
Serial No. 1-179

ITEM 1

Provide a summary description of all open* cooling water systems present inside containment. Your description of the cooling water systems must include: (a) Mode of operation during routine reactor operation and in response to a LOCA; (b) Source of water and typical chemical content of water; (c) Materials used in piping and coolers; (d) Experience with system leakage; (e) History and type of repairs to coolers and piping systems (i.e., replacement, weld, braze, etc.); (f) Provisions for isolating portions of the system inside containment in the event of leakage including vulnerability of those isolation provisions to single failure; (g) Provisions for testing isolation valves in accordance with Appendix J to 10 CFR 50 (h) Instrumentation (pressure, dew point, flow, radiation detection, etc.) and procedures in place to detect leakage; and (i) Provisions to detect radioactive contamination in service water discharge from containment.

* An Open system utilizes an indefinite volume, such as a river, so that leakage from the system could not be detected by inventory decrease. In addition, a direct radioactive pathway might exist to outside containment in the event of a LOCA simultaneous with a system leak inside containment. A closed system utilizes a fixed, monitored volume such that leakage from the system could be detected from inventory decrease and a second boundary exists to prevent loss of containment integrity as a result of a system leak inside containment.

RESPONSE:
Item 1

The Davis-Besse No. 1 containment (CTMT) vessel contains one open cooling water system referred to as the Service Water System. One of the functions of the Service Water System is to supply cooling water to various heat exchangers at the station. The Service Water System contains three pumps which take suction from Lake Erie, and supply lake water to the various components at the station. After the service water passes through the components, the Service Water is either diverted to the Circulating Water System (Cooling Tower) or returned to the lake.

The Service Water System supplies cooling water to one system in containment, the Containment Air Cooler System. The Containment Air Cooler System consists of three air cooling units, located inside the Containment vessel. Each consists of a finned tube cooling coil and a direct driven fan. The Service Water passes through the tubes of the coolers.

The Containment Air Coolers are designed to remove heat from the Containment atmosphere during normal operation. During a Loss of Coolant Accident, the Containment Air Cooler System provides cooling of the Containment atmosphere to reduce the pressure build up in the Containment vessel thus reducing the leakage of radioactivity from Containment.

RESPONSE:
Item 1A.

During routine reactor operation - two Containment Air Coolers are operating (in high speed) and the third Containment Air Cooler is idle in the standby mode. A modulating control valve in the Service Water outlet of each cooler controls the amount of Service Water flow through the cooler regulating the amount of cooling, thus maintaining a desired Containment air temperature. The normal Service Water flow through each cooler is approximately 1600 gpm.

RESPONSE:
Item 1B.

The source of water for the Service Water system is Lake Erie.

The typical chemical content of Lake Erie water is as follows:

Calcium	45 mg/L
Magnesium	11 mg/L
Sodium	12 mg/L
Chloride	22 mg/L
Nitrate	12 mg/L
Sulfate	37 mg/L
Phosphate	1.5 mg/L
Silica	2 mg/L
Alkalinity as C_aCO_3	101 mg/L
Suspended Solids	131 mg/L
Dissolved Solids	225 mg/L
Dissolved Oxygen	10 mg/L
pH	8.1

The Service Water is continuously chlorinated to prevent slime and algae growth in the heat exchangers of the Service Water System.

RESPONSE:
Item 1C.

All Service Water system piping material located in Containment is carbon steel piping. The Containment Air Cooler tube material through which the Service Water flows is 90/10 copper nickel alloy; the external fins, clamped to the tubes, are copper.

RESPONSE:
Item 1D&E

An investigation to identify experiences of Service Water leakage in Containment, indicated that there is no record of problems with leakage from either the Service Water system piping in containment or the Containment Air Cooler coils. As a result, there have been no repairs necessary to be made to the Service Water piping in containment or to the Containment Air Cooler coils.

RESPONSE:
Item 1F.

Each Containment Air Cooler has a 8" Service Water supply header which enters containment and splits into two - 6" supply lines which supply the Containment Air Cooler with cooling water.

Each Containment Air Cooler has two 6" Service Water return lines which combine into one 8" return header, inside Containment, leaving Containment as a 8" header (see Figure 1).

In the event of a Service Water System leak inside containment, the Service Water System in containment may be isolated from outside and/or inside containment.

If a Service Water leak is suspected in either the Service Water piping or Containment Air Cooler, the Service Water supply and return to each Containment Air Cooler may be completely isolated by valves located outside of containment. Containment Air Cooler 1-1 has two valves in series, in both the 8" supply header and 8" return header, which can be closed to isolate Service Water to Containment Air Cooler 1-1. Containment Air Cooler 1-2, also has two valves in series, in both the 8" supply header and 8" return header, which can be closed to isolate Service Water to Containment Air Cooler 1-2. Containment Air Cooler 1-3 has three valves in series, in both the 8" supply header and 8" return header, which can be used to isolate Service Water to Containment Air Cooler 1-3.

If the Service Water leakage is observed to be from a Containment Air Cooler, each Containment Air Cooler has provisions to be isolated locally, inside containment. The two 6" Service Water supply lines and two 6" Service Water return lines each have an isolation valve which can be closed, from inside containment to isolate Service Water to the Containment Air Cooler.

Since the Service Water supply and return lines to each Containment Air Cooler have a minimum of two-valve isolation (outside of containment), a single valve failure should not prevent the isolation of Service Water to the affected component.

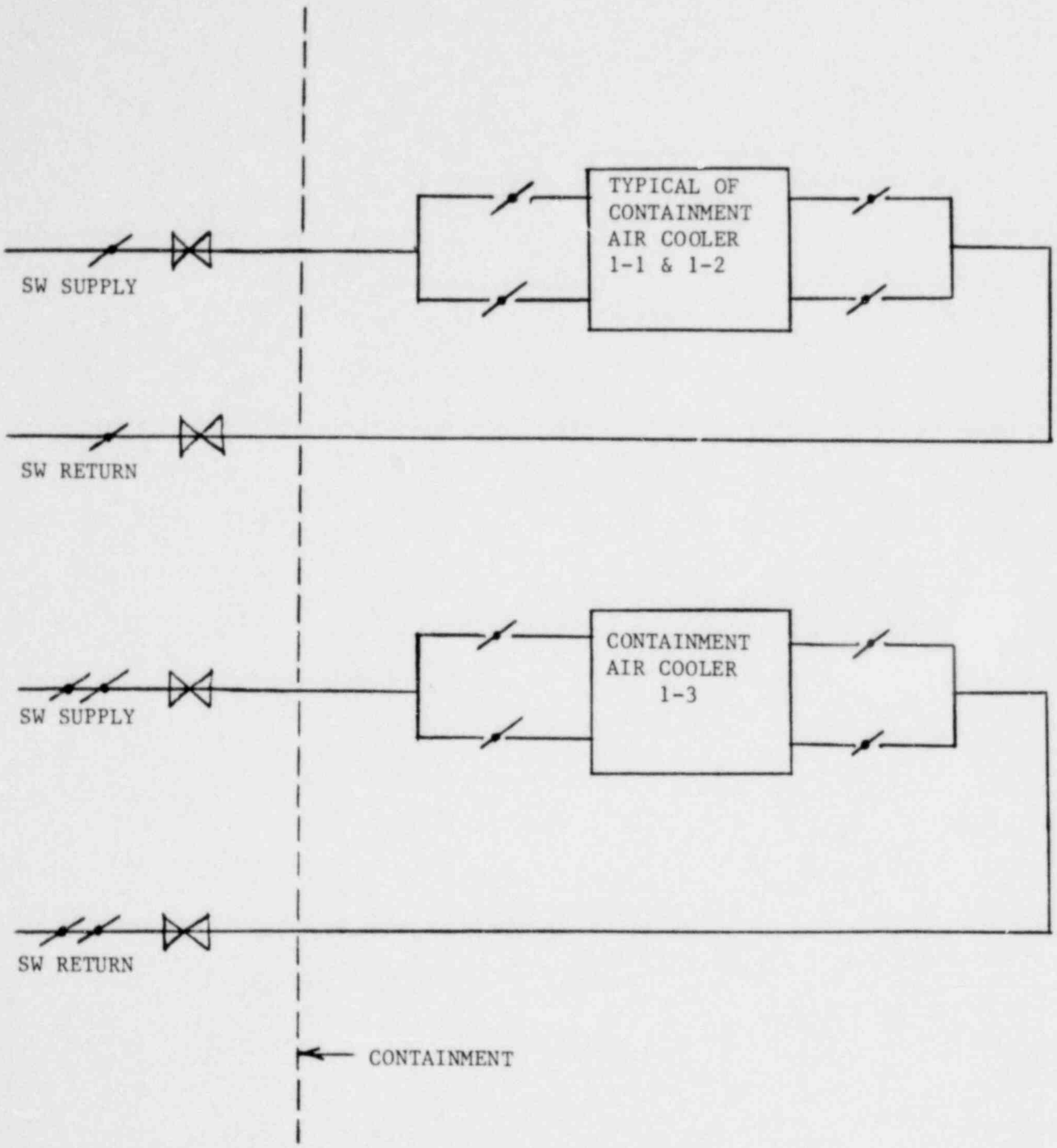

FIGURE 1
Simplified Drawing of
Service Water to the Containment
Air Coolers

RESPONSE:
Item 1G.

The Containment Air Coolers' Service Water inlet and outlet containment isolation valves are not subject to leakage testing. 10 CFR 50 Appendix J and Technical Specification 3.6.3.1 Table 3.6-2 provides for the exception from testing of the Containment Air Cooler Service Water inlet and outlet containment isolation valves.

RESPONSE:
Item 1H.

Each Containment Air Cooler has a leakage detection system which detects an accumulation of water under the Containment Air Cooler. The leakage detection system consists of a condensate drain pan, located under the Containment Air Cooler which collects condensate or Service Water leakage from the Containment Air Cooler. When a leakage flow of > 0.5 gpm is detected an annunciator is received in the control room.

The containment normal sump has two level transmitters, each of which provide the control room with (1) normal sump level indication (ft) and (2) a computer alarm on detection of a high level in the normal sump.

The containment normal sump has two level switches each which activate a control room annunciator and computer alarm on detection of a high level in the normal sump.

The containment normal sump contains two pumps which automatically cycle on/off upon detection of a high water level in the normal sump. The sump pumps normally cycle on/off at a sump level below that which activates the high level annunciators and computer alarms. When a sump pump is operating,a computer alarm in the control room is received.

Each sump pump motor has an elapsed time meter located in the auxiliary building which measures the accumulated pumping time for each sump pump. The pumping time is converted to a flow rate and thus the flow rate from the normal sump is calculated.

An additional method may be used to determine the volume of a significant amount of water pumped from the sump. The discharge of the sump pumps normally flows into the Miscellaneous Waste Drain Tank (MWDT). Observation of a level change in the Miscellaneous Waste Drain Tank could be utilized to calculate a large flow rate from the normal sump.

Procedures - The normal sump flow rate is determined once per shift during the performance of ST 5099.01, Miscellaneous Instrument Shift Check. The flow rate is currently calculated from the pumping times recorded on elapsed time meter for each sump pump. The calculated flow rate is recorded in a log book in the control room. Since the normal sump flow rate is calculated by the Surveillance Test approximately once every eight hours, any significant increase of leakage in containment would be immediately identified.

RESPONSE:

Item II.

Service Water discharge from containment combines with the Service Water discharges from other components in the plant and is then monitored for radioactivity by an off-line effluent sampler, RE8432.

The Service Water System discharge is normally used to supply make up water to the Circulating Water System (cooling tower). If the Service Water System discharge is diverted to the lake, the Service Water discharge mixes with approximately 10 to 15 thousand gallons of dilution water. The diluted Service Water discharge is then discharged to the lake after being monitored for radiation by an off-line effluent sampler (RE8433).

If radioactivity is suspected in the Service Water discharge from containment, provisions exist to sample Service Water discharge from Containment.

ITEM 2

For plants with open cooling water systems inside containment take the following actions:

a. Verify existence or provide redundant means of detecting and promptly alerting control room operators of a significant accumulation of water in containment (including the reactor vessel pit if present).

b. Verify existence or provide positive means for control room operators to determine flow from containment sump(s) used to collect and remove water from containment.

c. Verify or establish at least monthly surveillance procedures, with appropriate operating limitations, to assure plant operators have at least two methods of determining water level in each location where water may accumulate. The surveillance procedures shall assure that at least one method to remove water from each such location is available during power operation. In the event either the detection or removal systems become inoperable it is recommended that continued power operation be limited to seven days and added surveillance measures be instituted.

d. Review leakage detection systems and procedures and provide or verify ability to promptly detect water leakage in containment, and to isolate the leaking components or system. Periodic containment entry to inspect for leakage should be considered.

e. Beginning within 10 days of the date of this bulletin, whenever the reactor is operating and until the measures described in (a) through (d) above are implemented, conduct interim surveillance measures. The measures shall include where practical (considering containment atmosphere and ALARA considerations) a periodic containment inspection or visual surveillance to check for water leakage. If containment entry is impractical during operation, perform a containment inspection for water leakage at the first plant shutdown for any reason subsequent to receipt of this bulletin.

f. Establish procedures to notify the NRC of any service water system leaks within containment via a special licensee event report (24 hours with written report in 14 days) as a degradation of a containment boundary.

RESPONSE:
Item 2A.

The containment vessel drains to the lowest point in containment, that being the normal sump. Therefore, a significant accumulation of water in containment (including the reactor vessel pit) would be detected by a high level in the normal sump. There are four instruments located in the normal sump which detect an accumulation of water in the normal sump. These instruments promptly alert the control room operators to a significant accumulation of water in the containment normal sump. These instruments provide the control room operators with the following alarm information:

NORMAL SUMP INFORMATION DISPLAYED IN THE CONTROL ROOM

INSTRUMENT	ANNUNCIATOR	COMPUTER POINT ALARM CRT	COMPUTER POINT ALARM ALARM TYPER	LEVEL INDICATION
LSH 1546A	X	X	X	
LSH 1546B	X	X	X	
LT 1546A		X	X	X
LT 1546B		X	X	X

Therefore, there currently exists a redundant means for the detection and prompt alerting of control room operators to a significant accumulation of water in containment. The existing instrumentation therefore satisfies the requirements of this Item 2A.

RESPONSE:
Item 2B.

The containment normal sump contains two sump pumps which remove the accumulation of water in the sump by pumping the water from containment to a drain tank, located in the Auxiliary Building.

The control room operators normally determine the flow from the normal sump by recording the elapsed pumping time of each sump pump motor. Each sump pump motor has an elapsed time meter located in the Auxiliary Building. Using the elapsed pumping time from each pump and the known pumping capacity of each pump the flowrate from the normal sump is determined.

An additional method can be used to determine the volume of a significant amount of water pumped from the sump. The discharge of the sump pumps normally flows into the Miscellaneous Waste Drain Tank (MWDT). Observation of a level change in the Miscellaneous Waste Drain Tank could be utilized to calculate a significant flowrate from the normal sump.

RESPONSE:
Item 2C.

The operability of the normal sump level instrumentation and sump pump is currently verified by the performance of ST 5041.01, "Containment Vessel Normal Sump Level and Flow Monitoring System Channel Calibration Surveillance Test" and ST 5041.02, "Normal Sump Level and Flow Monitoring System Channel Calibration Surveillance Test." Both ST 5041.01 and ST 5041.02 are performed every 18 months per Technical Specification 4.4.6.1.b. No existing Surveillance Tests currently verify the operability of normal sump level indicators and sump pumps on a more frequent basis.

ST 5099.02, Daily Instrument Channel Check Surveillance Test will be modified to include: 1) Verification of the operability of the sump level instrumentation, via a channel check and sump pumps. 2) The recommendation to evaluate the limitation of power operation during the inoperability of the sump level indication system or sump pump system. 3) Added surveillance measures during the inoperability of the sump level indication system or sump pump system. The modifications to ST 5099.02 are scheduled to be completed by February 15, 1981.

RESPONSE:
Item 2D.

The containment normal sump flowrate is determined approximately once every 8 hours (in Modes 1-4) by the performance of ST 5099.01, "Miscellaneous Instrument Shift Check Surveillance Test". Any increase in containment leakage will be reflected by an increase in the normal sump flowrate.

ST 5099.01 is being modified to include guidelines for the determination of the source of a significant increase in containment leakage and if necessary the isolation of the suspected component. The modification to ST 5099.01 is scheduled to be completed by February 15, 1980.

A general inspection of containment is required to be performed by PP 1102.02, "Plant Startup Procedure" prior to reaching criticality on each plant startup.

RESPONSE:
Item 2E.

Since containment entry is impractical during operation, a containment inspection for water leakage was performed following the first plant shutdown, at 2000 hours on December 6, 1980. The containment vessel will be inspected for water leakage following future plant shutdowns until the implementation of measures described in items 2c & 2d. (Scheduled to be completed by February 15, 1980).

RESPONSE:
Item 2F.

ST 5099.01 "Miscellaneous Instrument Shift Check" will be modified to provide a guideline to notify the NRC via a special licensee event report (24 hours with a written report in 14 days) upon verification of a significant service water leak in containment. The modification to ST 5099.01 is scheduled to be completed by February 15, 1981.

ITEM 3

For plants with closed cooling water systems inside containment provide a summary of experiences with cooling water system leakage into containment.

RESPONSE:

The containment vessel contains one closed cooling water system, the Component Cooling Water System. The Component Cooling Water System supplies cooling water to the following components in containment:

1) Reactor Coolant Pump - seal coolers
2) Reactor Coolant Pump Motor - air coolers, bearing coolers
3) Control Rod Drive Motor coolers
4) Reactor Coolant Letdown cooler

An investigation was performed to identify experiences of Component Cooling Water System leakage into containment. A review of equipment files indicated that five minor repairs were required. The minor leaks were as follows:

1) CCW vent valve found leaking
2) Instrument fitting leaking on RCP 1-1-1 bearing oil cooler
3) Flange leaking on RCP 1-1-2 seal cooler
4) Flange leaking on RCP 1-1-1 bearing oil cooler
5) Swagelock fitting leaking on a Control Rod Drive Motor

The CCW header in containment was hydrostatically tested for leakage during the past refueling outage. Prior to the performance of the hydrostatic test, valves that are normally capped are uncapped. The piping system is then pressurized and the system is inspected for leaks. Six valves were found to be leaking, five with a leakage $\leq$ 75 drops/min and one vent valve with a larger leakrate. All six valves were repaired. The six valves which were found to be leaking during the test would be capped during normal operation and thus would not have produced leakage into containment unless the caps had leaked.

SUBMITTAL
FOR THE
DAVIS-BESSE NUCLEAR POWER STATION
UNIT 1
FACILITY OPERATING LICENSE NPF-3
IN RESPONSE TO A CFR 50.54 (f)
REQUEST DATED NOVEMBER 21, 1980

This response is filed in accordance with 10 CFR 50.54(f) relating to Mr. James G. Keppler's letter of November 21, 1980. This deals with the prevention of damage due to water leakage inside containment.

By ____________________
Vice President, Nuclear

Sworn to and subscribed before me this fifth day of January, 1981.

____
Notary Public

LINDA L. COSTELL
Notary Public
My Commission Expires