PSE&G

Ref. 77-12A

Public Service Electric and Gas Company 80 Park Place Newark, N.J. 07101 Phone 201/430-7000

July 27, 1978

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Attention: Mr. Albert Schwencer, Chief
Operating Reactors Branch #1
Division of Operating Reactors

Gentlemen:

REQUEST FOR AMENDMENT
FACILITY OPERATING LICENSE NO. DPR-70
SALEM GENERATING STATION
DOCKET NO. 50-272

In accordance with the Atomic Energy Act of 1954, as amended, and the regulations thereunder, we hereby transmit copies of our revised request for amendment to Facility Operating License No. DPR-70 for Salem Generating Station, Unit No. 1.

This change consists of one (1) modification to an originally proposed change to the Environmental Technical Specifications (Appendix B), dated December 21, 1977. The modification is as agreed in a conference call on April 13, 1978, among your staff (Messrs. G. Zeck and W. Pasciak) and our Licensing and Environment Department (Messrs. D.E. Cooley and M.D. London). It relates to the selection of a different sample depth for the river monitoring location "outside and downstream of the mixing zone" for the following water quality parameters:

1. Chlorine (ETS Section 3.1.1.1)
2. Dissolved Oxygen (ETS Section 3.1.1.2)
3. Suspended Solids (ETS Section 3.1.1.3)
4. Other Chemicals (ETS Section 3.1.1.4)

This transmittal includes three (3) signed originals and forty (40) copies.

Very truly yours,

Frank P. Librizzi
General Manager -
Electric Production

Attchs.

The Energy People

Cook
S 3/40

Ref. LCR 77-12A

U.S. NUCLEAR REGULATORY COMMISSION
DOCKET NO. 50-272

PUBLIC SERVICE ELECTRIC AND GAS COMPANY
FACILITY OPERATING LICENSE NO. DPR-70
NO. 1 UNIT
SALEM GENERATING STATION

Public Service Electric and Gas Company hereby submits proposed changes to Facility Operating License No. DPR-70 for Salem Generating Station, Unit No. 1. This change request relates to Environmental Technical Specifications (Appendix B) of the Operating License, and pertains to the selection of different sampling depth for several river monitoring locations.

Respectfully submitted,

PUBLIC SERVICE ELECTRIC AND GAS COMPANY

By: Frederick W. Schneider
FREDERICK W. SCHNEIDER
VICE PRESIDENT

Ref. LCR 77-12A

STATE OF NEW JERSEY)
) SS:
COUNTY OF ESSEX)

FREDERICK W. SCHNEIDER, being duly sworn according to law deposes and says:

I am a Vice President of Public Service Electric and Gas Company, and as such, I signed the request for change to FACILITY OPERATING LICENSE NO. DPR-70.

The matters set forth in said change request are true to the best of my knowledge, information, and belief.

Frederick W Schneider
FREDERICK W. SCHNEIDER

Subscribed and sworn to before me
this 27th day of July, 1978.

Loraine Y Beard
Notary Public of New Jersey
LORAINE Y. BEARD
NOTARY PUBLIC OF NEW JERSEY
My Commission Expires August 12, 1982

My commission expires on 8/12/82

3.1 NON RADIOLOGICAL SURVEILLANCE

3.1.1 ABIOTIC

3.1.1.1 Chlorine

Objective

To determine the concentration of free available and total residual chlorine in the station effluent water in an effort to maintain an optimum chlorination program for prevention of heat exchanger fouling while minimizing the environmental impact on the receiving waters.

Specification

Grab samples shall be taken monthly (weather permitting) during a chlorination cycle and analyzed for free available and combined residual chlorine. The samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. felow the surface), and at a point outside and downstream of the mixing zone (5 ft. below the surface).

Reporting Requirement

In the event the analysis of the sample taken from the point outside and downstream of the discharge water mixing zone indicates that the total residual chlorine at the point exceeds the ambient total residual chlorine level in the river by 0.1 mg/liter, a report shall be made in accordance with Specification 5.6.2.

Bases

This monitoring program will determine the magnitude and extent of free available and total residual chlorine concentration increases over ambient within and outside the mixing zone. These parameters vary due to changes in chlorination level, tidal conditions, and the chlorine demand of the receiving water.

Chlorine monitoring specified in this section should demonstrate that reduction in chlorine residual occurs in the mixing zone through dilution and the satisfaction of chlorine demand in the receiving water.

Finally, this monitoring is of considerable value in maintaining an optimal chlorination program to prevent heat exchanger fouling. Chlorine demand in the ambient water and the concentration of fouling organisms may be inferred from the quantity of chlorine required to produce a given residual at the condenser outlet.

3.1.1.2 Dissolved Gases

Objective

To ascertain that the dissolved oxygen level is not depressed to the extent that it may be harmful to the indigenous population of the receiving waters as a result of station operation.

Specification

The dissolved oxygen levels shall be monitored once per month (weather permitting) utilizing a method which is acceptable to the EPA. Grab samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface), and at a point outside and downstream of the mixing zone (5 ft. below the surface).

Reporting Requirement

If dissolved oxygen level is found to be less than 6 mg/l at the discharge, a comparison study of the intake, discharge and downstream dissolved oxygen levels shall be conducted to determine if the oxygen depression has been caused by station operation. If it is so determined, a report shall be made in accordance with Specification 5.6.2.

Bases

Monthly analyses of dissolved oxygen will aid in differentiating between normal seasonal fluctuations and changes due to station operation.

The 6 mg/liter limitation is required by the Water Quality Certificate issued by the Delaware River Basin Commission. The EPA recognizes more than one analytical method; therefore none is specified herein.

3.1.1.3 Suspended Solids

Objective

To determine the effect of plant operation on suspended solids in the receiving waters.

Specification

Suspended solids shall be monitored once per month (weather permitting). Grab samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface), and at a point outside and downstream of the mixing zone (5 ft. below the surface). These samples shall be analyzed for suspended solids by means of a method acceptable to EPA. Dissolved solids shall not be monitored.

Specification

Grab samples shall be taken once per month (weather permitting) and analyzed for the parameters listed in Table 3.1-1. The samples shall be taken at the intake structure (10 ft. below the surface), the outfall of the discharge (8 ft. below the surface), and at a point outside and downstream of the mixing zone (5 ft. below surface). These samples shall be analyzed for the parameters listed in Table 3.1-1 by a method acceptable to EPA.

Reporting Requirement

Reporting levels will be developed after the initial phases of plant operation. Post-operational data will be related to preoperational data to yield norms from which report levels will be established.

Bases

This monitoring program will serve to determine the effect of station operation on the quality of the receiving water. An evaluation of the program, after six months of full power operation, will be performed and those parameters which can be shown to be not significantly affected by station operation will be eliminated from the monitoring program subsequent to NRC staff review and approval. This program is in conformance with NPDES requirements.

The utilization of tests prescribed by EPA will insure the employment of current, state-of-the-art methods and accuracies.

Justification

The NRC's concern with respect to the 18 feet water quality sampling depth at the station outside and downstream of the mixing zone is reasonable. The original purpose of specifying this depth for Section 3.1.1.1, Biocides, was to make that sampling effort coincide with the monitoring performed for the other chemical parameters in ETS Sections 3.1.1.2, 3.1.1.3, and 3.1.1.4. The depths for sampling those parameters had been established during the preoperational monitoring period.

Since the operational monitoring program is intended to detect station impact, if any, it is important to select sampling depths which are likely to encompass any evidence of station impact. The licensee has reassessed the 18 feet depth for the sampling station outside and downstream of the mixing zone, and proposes to substitute a depth of 5 feet.

This change, which would apply to all measurements made at that sampling point, is justified based on recent studies which indicate that the thermal effluent discharged by the Salem Generating Station is under most conditions restricted by tidal currents to the eastern shore of the Delaware River. In the absence of strong winds, which tend to disperse the plume at the water's surface, the major portion of the plume remains in a narrow band (usually less than 300' across)

during the ebb and flow tides. The longitudinal extent of the plume is quite variable from day to day, but generally is not detectable beyond two miles from the plant. During the slack tides, the plume usually forms a pool in the immediate vicinity of the discharge, with the major portion of the heated water staying within 2500 ft. of the discharge point. This pool is fairly rapidly advected away from the discharge just after the slack tides, and the plume is returned to its primarily linear conformation.

The Delaware River in the vicinity of the Salem Generating Station is characteristically unstratified in structure. Only small salinity gradients were measured outside the main channel during recent monitoring. This absence of structure indicates a very well mixed tidal regime as might be expected from the strong currents. As the thermal effluent leaves the discharge pipes, it rapidly rises to the surface because of its lesser density. During the flood and ebb tides, the rising plume mixes fairly well with the oncoming column of water producing a consistent vertical structure in the upper five meters of the river (Figure 1 indicates the locations of the sampling stations). Figures 2 through 5 show the influence of the plume on the vertical temperature distribution at stations B5 and C5 (compared to B4 and C4 which are beyond the primary influence of the plume) on the flood and ebb tides, respectively. Ambient

temperature patterns are normally maintained, with the effluent heat contributing to overall higher temperatures. Thus, the thermal effluent appears to dilute through most of the water column. In contrast, during the brief period at the slack tides, the plume generally tends to rise and then pool at the surface, mixing less with the deeper water. Variations in the character of the thermal plume are due mostly to climatic changes from day to day and through the seasons, to daily changes in the magnitude of the tidal currents, and to wind driven surface currents. Variations in the shape and extent of the plume can be very large, depending on the combination of the above factors, to which the plume is exposed.

As can be seen in Figures 2 through 5, the vertical temperature distribution (and the assumed distribution of plume constituents), is nearly uniform, except for the ebb tide condition in July during which higher temperatures were observed near the surface (between 0 and 2 meters depth).

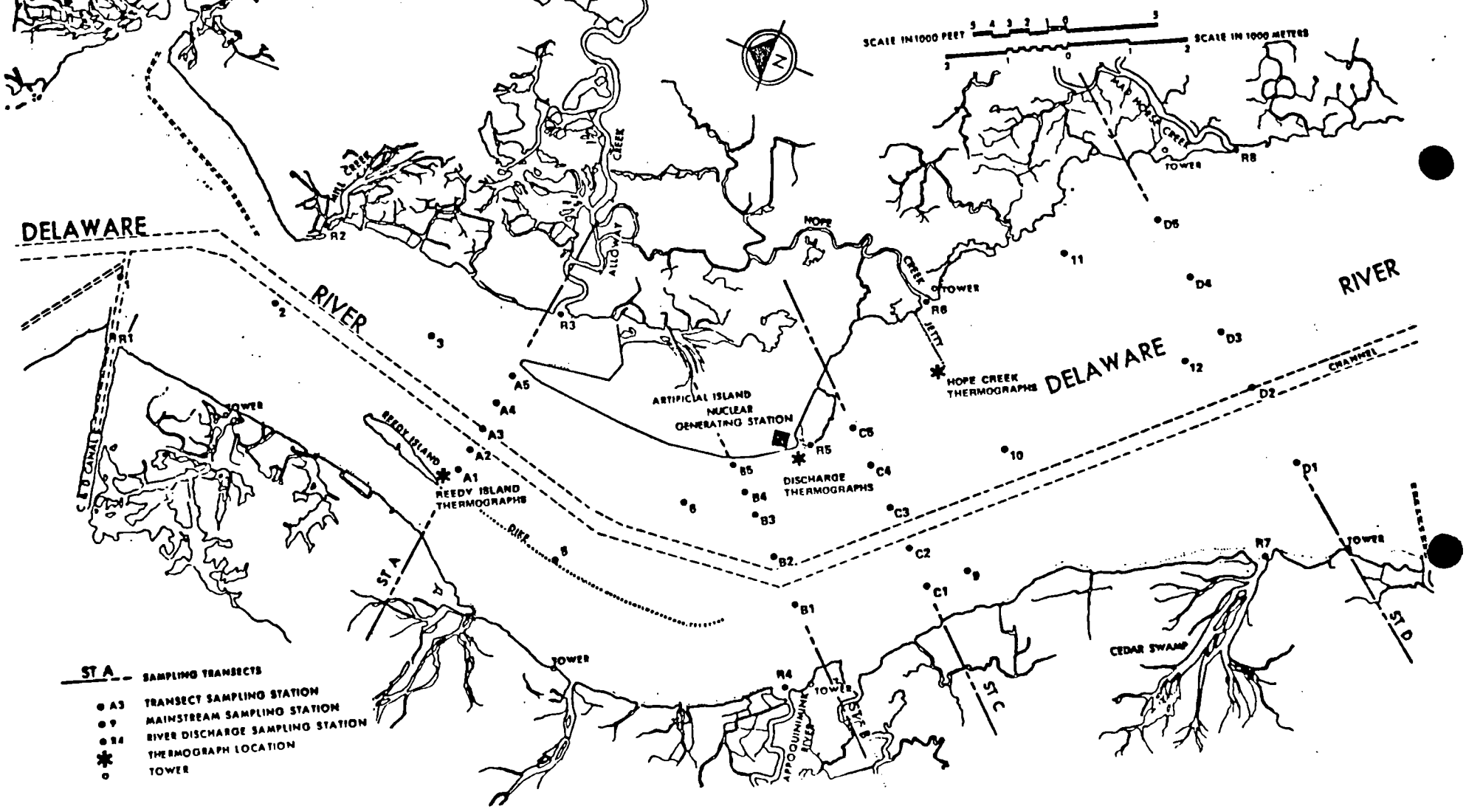
Therefore, although under most conditions, the plume appears to be well mixed, particularly outside and downstream of the mixing zone, it is reasonable to revise that sampling depth to approximately 5 feet. The licensee requests that the NRC approve this depth for all sampling outside and downstream of the mixing zone (Sections 3.1.1.1 through 3.1.1.4).

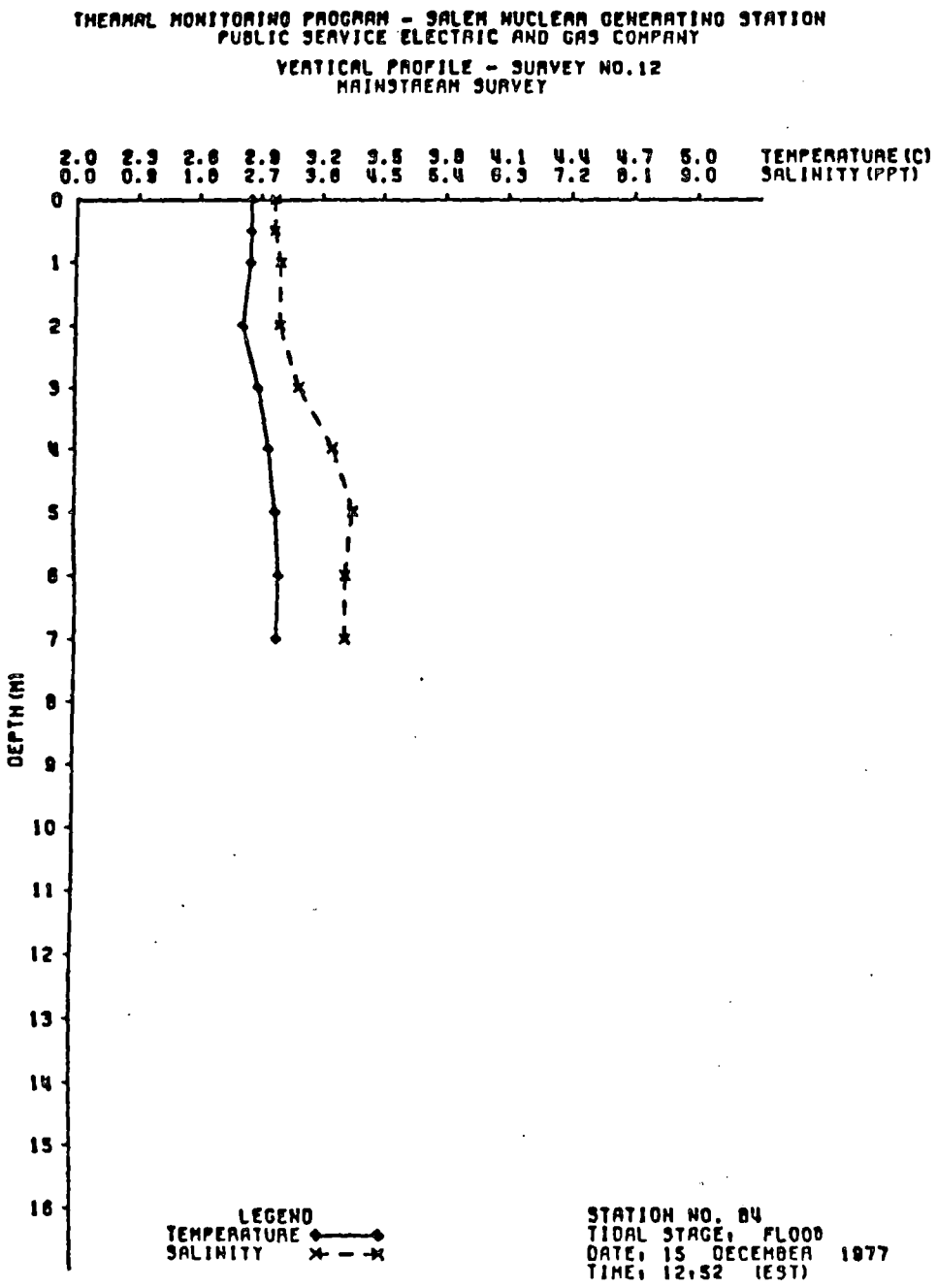
PUBLIC SERVICE ELECTRIC & GAS COMPANY

SALEM NUCLEAR GENERATING STATION

DELAWARE RIVER ESTUARY

FIGURE 1
LOCATION OF SAMPLING STATIONS





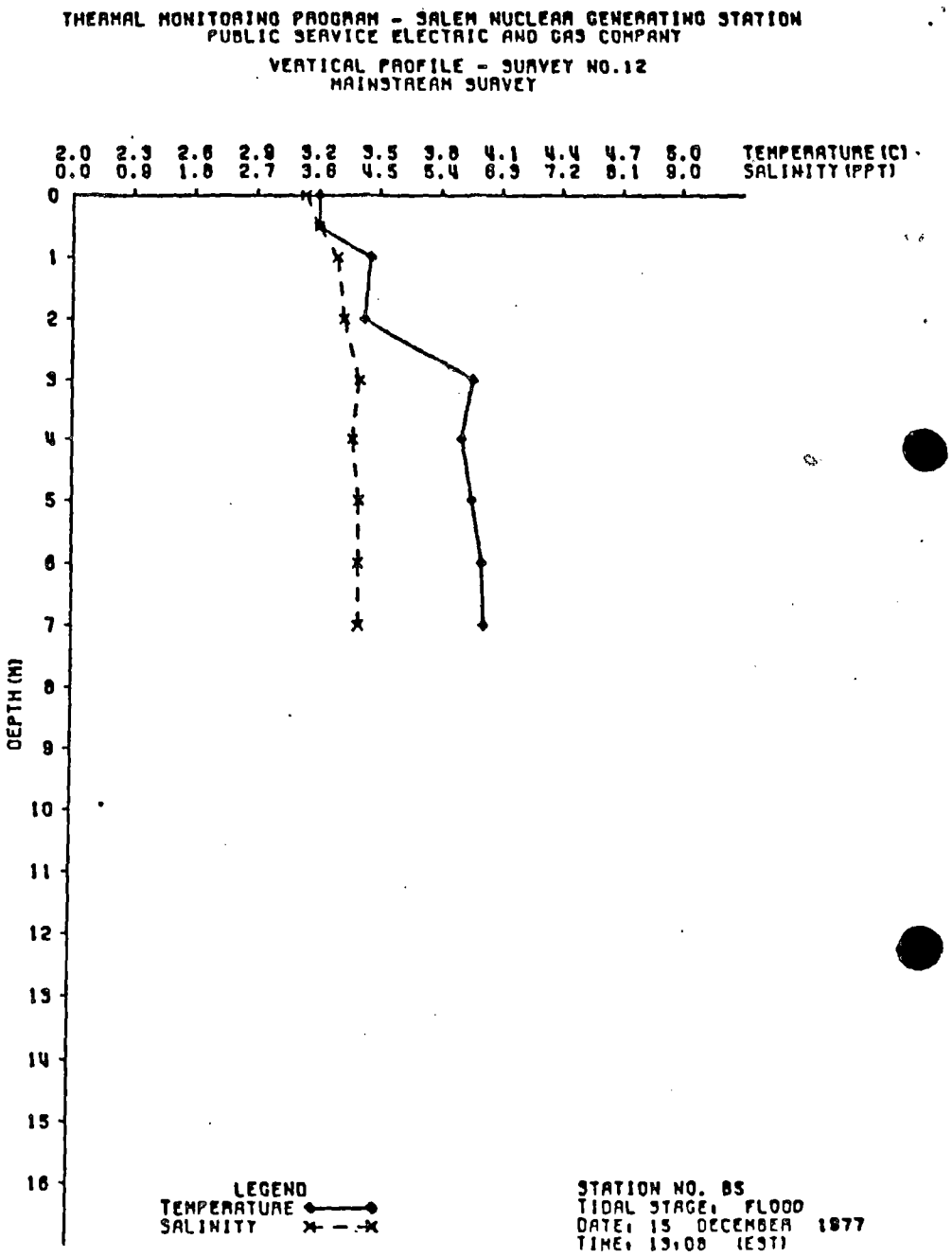
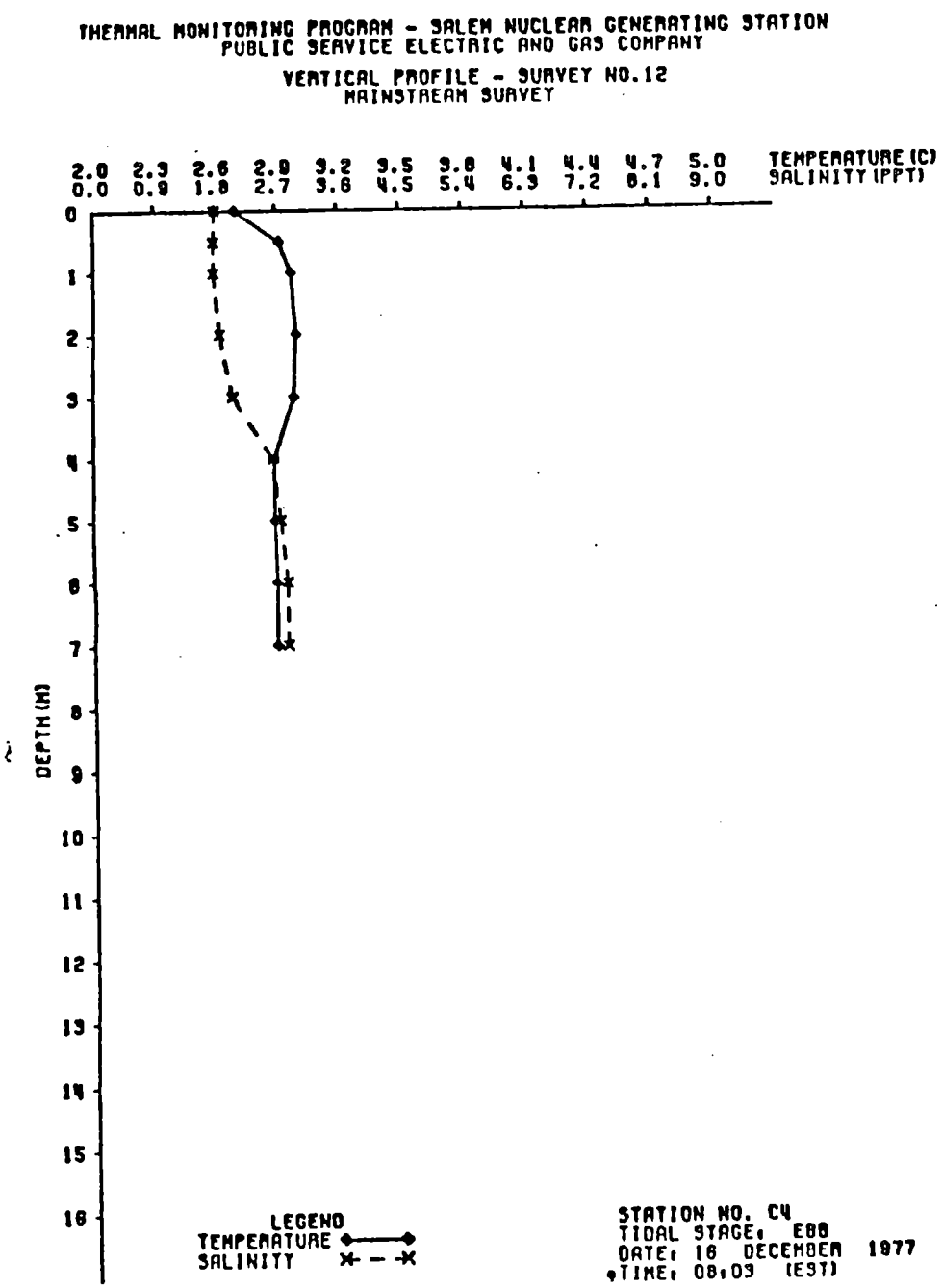


FIGURE 2 VERTICAL TEMPERATURE STRUCTURE, 15 DECEMBER 1977, FLOOD TIDE



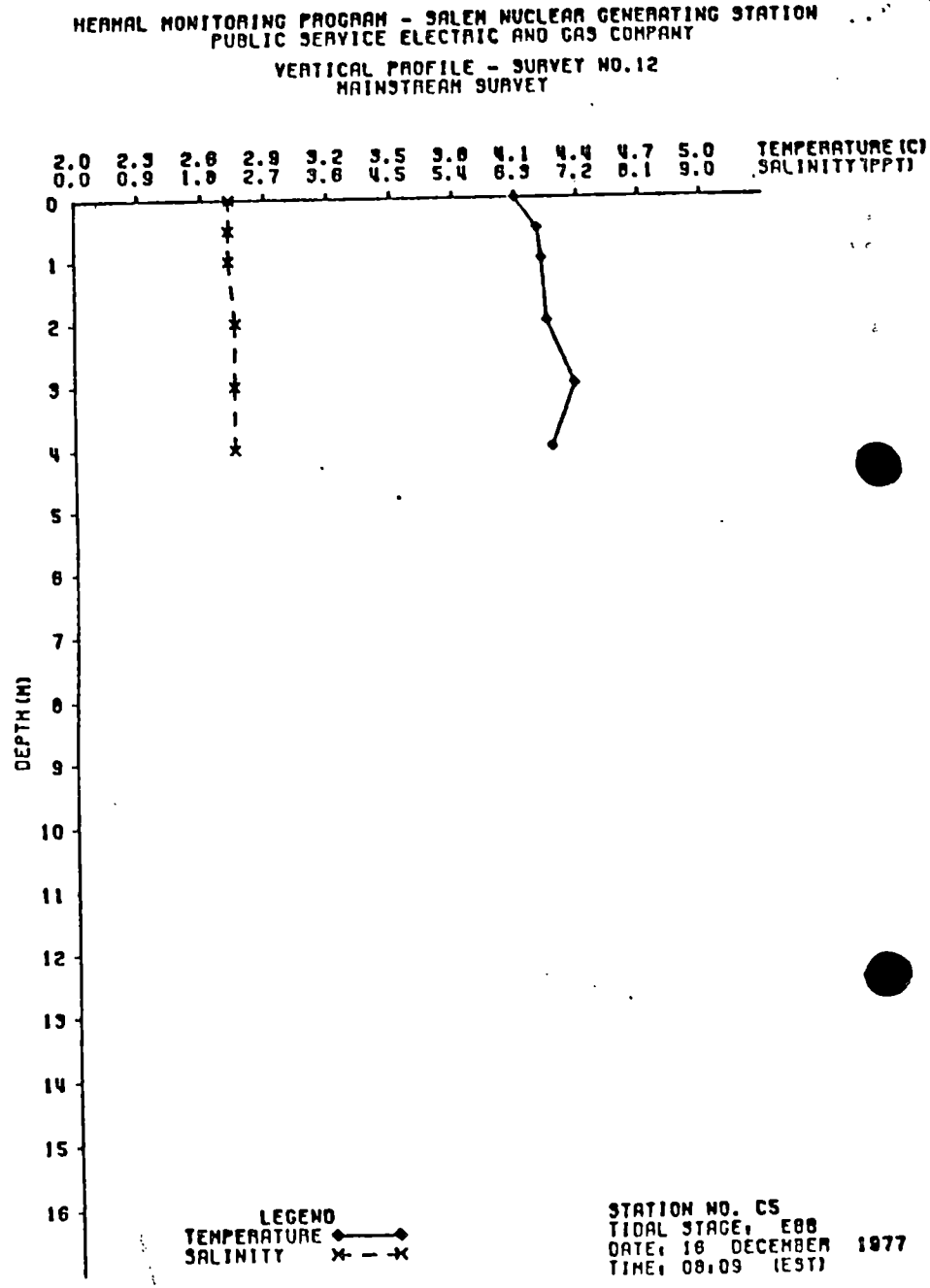


FIGURE 3 VERTICAL TEMPERATURE STRUCTURE, 16 DECEMBER 1977, EBB TIDE

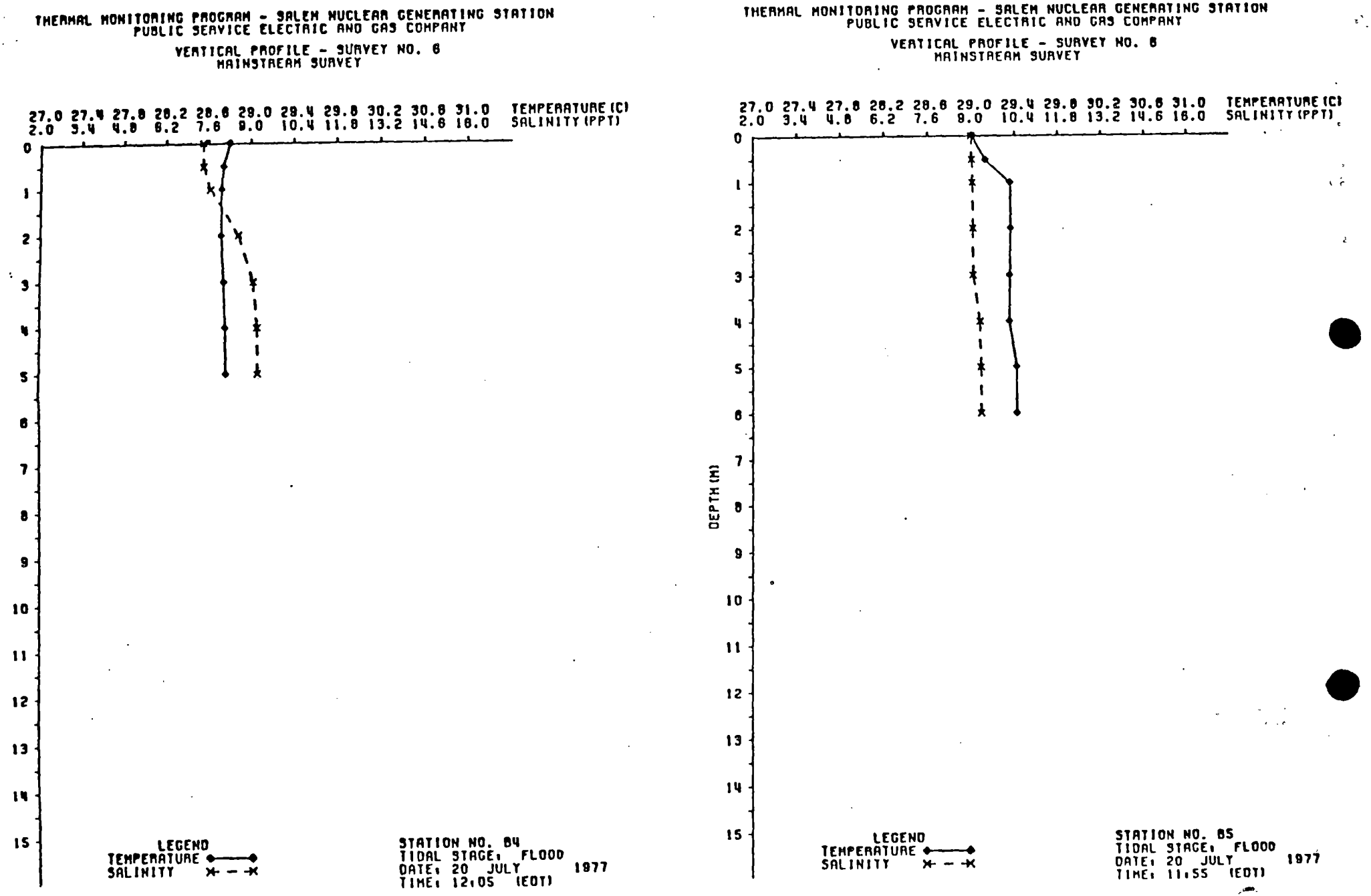
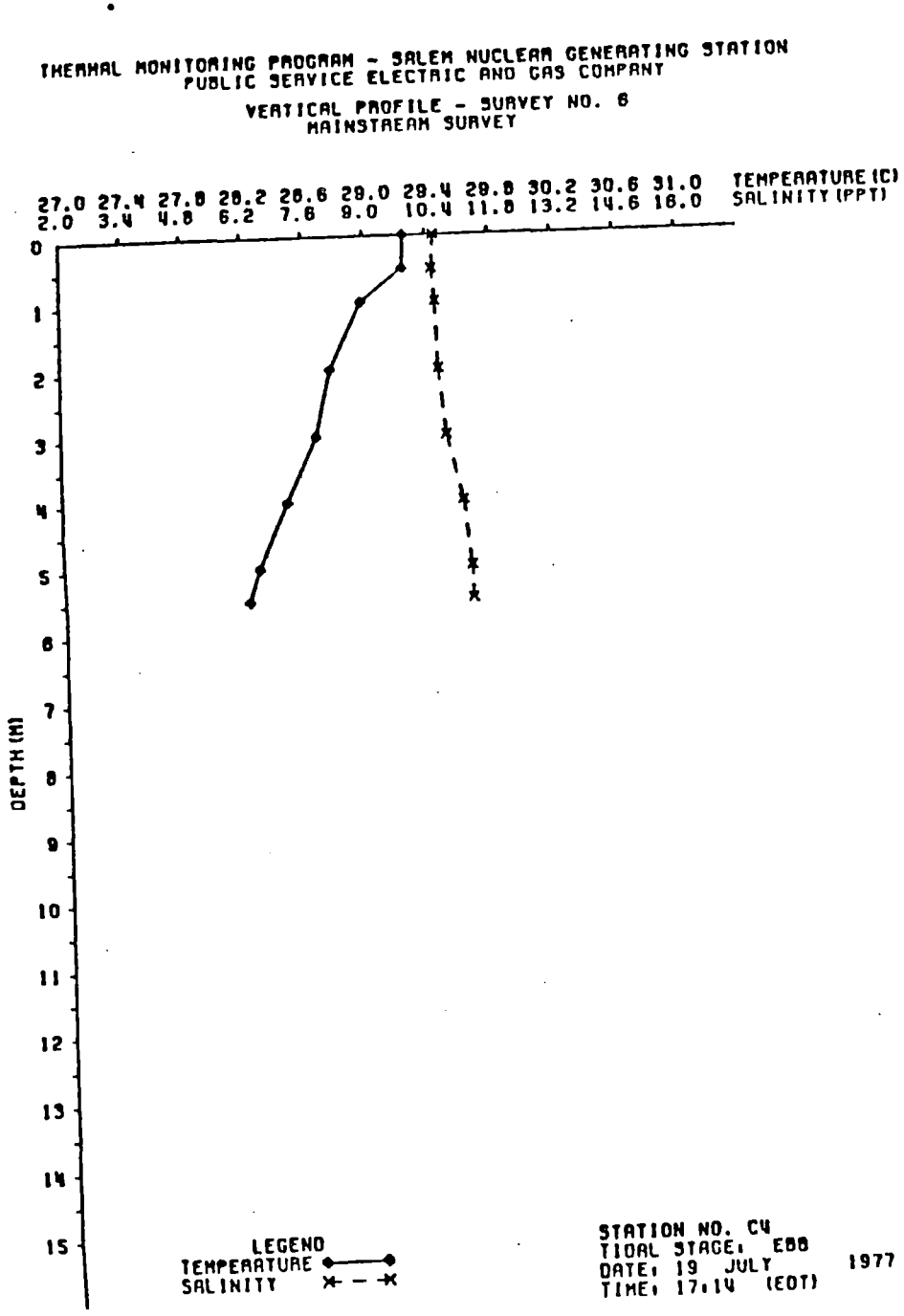


FIGURE 4 VERTICAL TEMPERATURE STRUCTURE, 20 JULY 1977, FLOOD TIDE



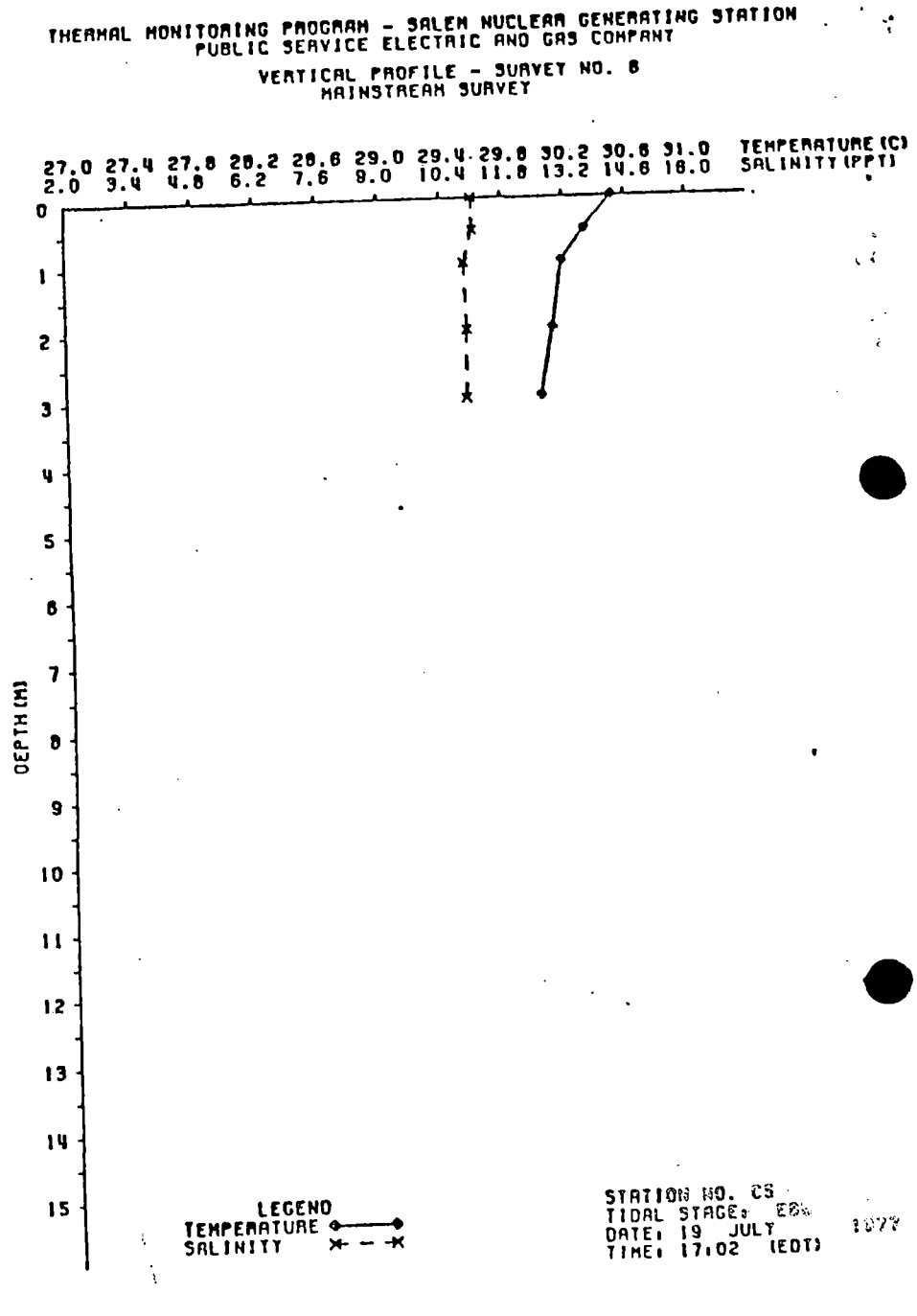


FIGURE 5 VERTICAL TEMPERATURE STRUCTURE, 19 JULY 1977, EBB TIDE